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O001/1183

Scientific Communication SC2 - IV Thrombolysis

BRIDGING THERAPY WITH TENECTEPLASE OR ALTEPLASE IN PATIENTS WITH LOW DIFFUSION-WEIGHED IMAGING ALBERTA STROKE PROGRAM EARLY COMPUTED TOMOGRAPHY SCORE

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Background and aims: Intravenous tenecteplase is an alternative to alteplase before mechanical thrombectomy (MT) in patients with large-vessel occlusion ischemic stroke (LVOS). Little data is available on its use in patients with large ischemic core. We aimed to compare the efficacy and safety of both thrombolytics in this population.
Methods: We conducted a retrospective analysis of patients with anterior circulation LVOS and diffusion-weighed imaging Alberta Stroke Program Early Computed Tomography Score (DWI-ASPECTS) $\leqslant$ 5 treated with tenecteplase or alteplase before MT from the TETRIS (tenecteplase) and ETIS (alteplase) French multicenter registries. Primary outcome was reduced disability at 3-month (shift analysis of the mRS). Safety outcomes were parenchymal hemorrhage (PH) and symptomatic intracranial hemorrhage (sICH). We used propensity score-weighting for all analyses.
Results: We analyzed 439 patients (tenecteplase: n=140; alteplase: n=299; inclusion period 2015-2021). Median [IQR] age was 70 years [55-81], NIHSS score 19 [16-22], DWI-ASPECTS 4 [3-5], onset-to-IVT and onset-to-puncture times 150 minutes [125-180] and 235 minutes [188-296], respectively. Successful reperfusion rate was 84.5%. Following propensity score weighting, all baseline variables were well-balanced between both treatment groups. Compared with alteplase, patients treated with tenecteplase had similar 3-month mRS (cOR for reduced disability: 1.16; 0.91-1.49; p=0.23), lower rates of PH (OR 0.61; 0.43-0.88; p=0.01) but similar rates of sICH (OR 1.11; 0.61-2.02; p=0.74).
Conclusions: Our data are reassuring regarding the safety and efficacy of tenecteplase compared to alteplase in bridging therapy for patients with LVOS and a large ischemic core in routine clinical care.
Disclosure of interest: No

O002/2068

Scientific Communication SC2 - IV Thrombolysis

INTRA-ARTERIAL THROMBOLYSIS FAVORS DELAYED CLEARANCE OF VESSEL OCCLUSIONS FOLLOWING INCOMPLETE REPERFUSION WITH THROMBECTOMY

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Background and aims: Intra-arterial thrombolysis (IAT) may be applied to treat distal vessel occlusions which cause incomplete reperfusion following thrombectomy. Because immediate reperfusion after IAT occurs rarely, aim of this analysis was to assess the effect of IAT using 24h perfusion imaging.
Methods: All patients undergoing thrombectomy with incomplete reperfusion (Thrombolysis in Cerebral Infarction (TICI) 2a-2c score) and available 24h perfusion imaging were assessed (n=459). Perfusion imaging was rated as delayed distal vessel occlusion clearance if time-sensitive perfusion maps (Tmax/TTP) did not show wedge-shaped delays suggestive of persisting occlusions corresponding to the post-procedural angiographic deficit. Forty patients treated with intra-arterial (IA) Urokinase were compared to controls using logistic regression and inverse probability weighting adjusting for baseline differences and factors associated with delayed distal vessel occlusions clearance (e.g. collateral status, higher TICI score).
Results: Rate of distal vessel occlusion clearance was 60.5% (278/459). Patients treated with IA Urokianse were younger and had worse TICI scores. After adjustment, however, IA Urokinase was associated with higher rates of delayed distal vessel occlusion clearance (aOR 2.7, 95%CI 1.2 – 6.5) and lower rates of new infarction in the hypoperfused territory

(aOR 4.7, 95%CI 1.9 – 11.7). This was tangible also in improved functional outcomes (modified Rankin scale score 0-2 aOR 2.2, 95%CI 1.0 – 5.1).
Conclusions: Rescue IAT favors delayed clearance of distal vessel occlusions after incomplete thrombectomy. The value of IAT as potential therapy for incomplete reperfusions following thrombectomy should be assessed in randomized controlled trials.
Disclosure of interest: No

O003/1105

Scientific Communication SC2 - IV Thrombolysis

IV THROMBOLYSIS IN PATIENTS TAKING DIRECT ORAL ANTICOAGULATION TREATMENT PRIOR TO STROKE ONSET: RESULTS FROM SITS-INTERNATIONAL STROKE REGISTRY

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Background and aims: Intravenous thrombolysis (IVT) is contraindicated for acute ischemic stroke (AIS) patients with ongoing direct oral anticoagulants (OACs) treatment. Limited data exists on off-label use of IVT in these patients. We investigated the safety and clinical outcomes of IVT for AIS patients with ongoing DOAC treatment.
Methods: We analysed data from the SITS - International Stroke Registry in AIS patients treated with IVT± endovascular treatment (EVT). We compared AIS patients with ongoing DOAC treatment vs. no OAC. Safety outcome were SICH by SITS-MOST and ECASS II definitions. Other outcomes were functional independence, measured by modified Rankin scale (mRS) score 0-2 and death by 3-month follow-up. Propensity score matching (PSM) with nearest neighbour matching algorithm was used for relevant clinical variables. Univariate analysis on the PSM datasets was used for the outcomes.
Results: We matched 738 patients with DOAC (n=140 EVT) to 738 (n=99 EVT) with no OAC. Mean age was 75 years and median NIHSSscore 11. Patients with DOAC had similar proportions of SICH by SITS-MOST (1.0 vs 1.3%, p-value: 0.82) and ECASS definition (3.6 vs 4.5%, p-value 0.47) compared patients without any OAC. At 3-month follow-up, patients with DOAC had similar proportions of mRS 0-2 (48.8 vs 49.0%, p-value 0.98) and death (25.0 vs 24.6%, p-value 0.97) compared to patients without any OAC.
Conclusions: In this observational study, we did not find any difference in SICH or other outcomes after IVT therapy in between AIS patient with ongoing DOAC and no OAC treatment. Randomised data are needed.
Disclosure of interest: No

O004/1756

Scientific Communication SC2 - IV Thrombolysis

COST-EFFECTIVENESS OF TENECTEPLASE VERSUS ALTEPLASE FOR STROKE THROMBOLYSIS EVALUATION TRIAL IN THE AMBULANCE TRIAL

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Background and aims: Tenecteplase administered to patients with ischemic stroke in a mobile stroke unit (MSU) has been shown to reduce the perfusion lesion volumes and result in ultra-early recovery. We now seek to assess the cost-effectiveness of tenecteplase in the MSU.
Methods: A within-trial (TASTE-A) economic analysis and a model-based long-term cost-effectiveness analysis were performed. This post-hoc within-trial economic analysis utilised the patient-level data (intention to treat, ITT) prospectively collected over the trial to calculate the difference in both healthcare costs and quality-adjusted life years (QALYs, estimated from modified Rankin scale score). A Markov microsimulation model was developed to simulate the long-term costs and benefits.
Results: In total, there were 104 patients with ischemic stroke randomised to tenecteplase (n=55) or alteplase (n=49) treatment groups, respectively in the TASTE-A trial. The ITT-based analysis showed that treatment with tenecteplase was associated with lower costs [A$28,903 vs A$40,150 (p=0.056)] and greater benefits [0.171 vs 0.158 (p=0.457)] than that for the alteplase group over the first 90 days post the index stroke. The long-term model showed that tenecteplase led to greater savings in costs (-A$28,295) and more health benefits (0.47 QALY or 0.31 LY gains). Tenecteplase-treated patients had reduced costs for rehospitalisation (-A$1,464), nursing home care (-A$16,767), and nonmedical care (-A$620) per patient.
Conclusions: Treatment of ischemic stroke patients with tenetplase was shown to be cost-effectiveness and improve QALYs in the MSU setting. The reduced total cost from tenecteplase was driven by savings from acute hospitalisation and reduce need for nursing home care.
Disclosure of interest: No

O005/2051

Scientific Communication SC2 - IV Thrombolysis

GLUNOMAB: A MONOCLONAL ANTIBODY COUNTERACTING THE NEUROVASCULAR AND NEUROINFLAMMATORY DAMAGES INDUCED BOTH BY ENDOGENOUS TPA AND FIBRINOLYTIC AGENTS (ALTEPLASE OR TENECTEPLASE) AFTER ISCHEMIC STROKE

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Background and aims: In addition to its profibrinolytic activity, tissue plasminogen activator (tPA) is also triggering strong toxicity through its binding to NMDA receptors (NMDAr) present on endothelial cells forming the blood brain barrier (BBB), leading to its overactivation and ultimately to BBB disruption. Here, we provide solid preclinical proofs demonstrating the therapeutic efficacy of a monoclonal antibody blocking tPA and NMDAr interaction, Glunomab, subsequently counteracting the neuroinflammatory and neurodegenerative processes implicated in the pathophysiology of ischemic stroke by restoring the physiological function of the blood-brain barrier.
Methods: We evaluated the efficacy of Glunomab in different animal models of thromboembolic stroke including with comorbidities, used alone or combined with thrombolytic agents. Magnetic Resonance Imaging, laser speckle flowmetry, behavioural tasks, flow cytometry and/or immunohistochemistry were used to evaluate treatment efficacy.
Results: By restoring the BBB function, Glunomab administration alone or combined with alteplase or tenecteplase was able to significantly reduce neuroinflammation, brain lesion volumes along with the risk of haemorrhagic transformations, translating into improved short and long-term neurological outcomes. For clinical translation, the therapeutic efficacy of Glunomab alone or its synergy with thrombolytic agents were also demonstrated in diabetic animals, one of the main comorbidities displayed by stroke patients.
Conclusions: Glunomab drastically limits ischemic damages induced both by endogenous and recombinant forms of tPA; either alteplase or its variant and new potential standard of care, tenecteplase. The humanized form of Glunomab, Glunozumab, has been developed. A clinical trial in ischemic stroke patients is currently in preparation.
Disclosure of interest: No

O006/1101

Scientific Communication SC2 - IV Thrombolysis

INTRAVENOUS THROMBOLYSIS PLUS ENDOVASCULAR TREATMENT VERSUS ENDOVASCULAR TREATMENT ALONE IN POSTERIOR CIRCULATION OCCLUSIONS; A MR CLEAN REGISTRY STUDY

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Background and aims: The effectiveness of intravenous thrombolysis (IVT) prior to endovascular treatment (EVT) is widely investigated in randomized trials and meta-analyses. These studies mainly concerned anterior circulation occlusions, whereas posterior circulation occlusions are scarce. We aimed to investigate clinical, technical, and safety outcomes of IVT in the posterior circulation prior to EVT in a nationwide registry.
Methods: All patients with an arterial ischemic stroke (AIS) due to a posterior circulation occlusion receiving endovascular treatment (EVT) in the MR CLEAN Registry were included. Primary outcome was a shift towards a better functional outcome on the modified Rankin scale (mRS) at 90 days. Secondary outcomes were favorable functional outcome (mRS 0-3), the occurrence of symptomatic intracranial hemorrhages (sICH), successful reperfusion rates (eTICI⩾2C), first-attempt successful reperfusion, and mortality at 90 days. Regression analyses with adjustments based on univariate analyses and literature were applied.
Results: A total of 248 patients were included, who received either IVT (n=125) or no IVT (n=123) prior to EVT. Preliminary results showed no differences in a shift on the mRS (acOR:1.04, 95%CI:0.61-1.76). Although sICH occurred more often in the IVT group (4.8% versus 2.4%), regression analysis did not show a significant difference (aOR:1.65, 95%CI:0.33-8.35). Successful reperfusion, favorable functional outcome, first-attempt successful reperfusion, and mortality did not differ between patients treated with and without IVT prior to EVT.
Conclusions: No differences were seen in clinical, technical, and safety outcomes in patients with a large vessel occlusion in the posterior circulation, treated with or without IVT prior EVT.
Disclosure of interest: No

O007/2494

Scientific Communication SC3 - Neurointervention – Imaging and Reperfusion

MR MICROSCOPY IN THROMBECTOMY TO ASSESS CLOT COMPOSITION AND PREDICT RECANALIZATION AND CLINICAL OUTCOME

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Background and aims: Mechanical thrombectomy (MT) is the standard of care for stroke patients with LVO eligible for endovascular treatment. Clot composition is not routinely assessed in clinical practice as no specific diagnostic value is attributed to it and MT is performed in a standardized "non-personalized" approach, irrespective of the underlying stroke etiology or clot composition. Whether different clot compositions are associated with intrinsic likelihoods of recanalization success or treatment outcome is unknown.
Methods: We performed a prospective, non-randomized, single center study and systematically analyzed the clot composition in 60 consecutive ischemic stroke patients undergoing MT at our institution. Clots were assessed by *ex vivo* high field MRI at 9.4T ("MR-microscopy", MR-M) and histopathology. Clot imaging was correlated with preinterventional CT for hyperdense artery sign (HAS) quantification and clinical data.
Results: MR-M had high accuracy of 95.4% to differentiate the different clot types (21/22 correct categorization). MR-M showed red blood cell-rich (23%), platelet-rich (28%) or mixed clots (48%). T2* times differed between the clots types ($p<0.05$). During MT white clots required

significantly more passes to achieve final recanalization (4.69 vs. 3.08 vs. 1.15 passes, $p<0.05$ and $p<0.001$), whereas red clots showed highest probability of first pass recanalization (76.92% vs 17.39 %). Clinically, white clots were associated with poorer mRS at 90 days post intervention.

Conclusions: Our study introduces MR-M to show that HAS or MR relaxometry could guide interventional strategy. This could enable a personalized treatment approach to improve outcome of patients undergoing MT.

Disclosure of interest: No

O008/376

Scientific Communication SC3 - Neurointervention – Imaging and Reperfusion

TISSUE CLOCK BEYOND TIME CLOCK: ENDOVASCULAR THROMBECTOMY FOR PATIENTS WITH LARGE VESSEL OCCLUSION STROKE BEYOND 24-HOURS

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Background and aims: Randomized trials proved the benefits of mechanical thrombectomy (MT) for select patients with large vessel occlusion (LVO) within 24-hours of last-known-well (LKW). Recent data suggest that LVO patients may benefit from MT beyond 24-hours. This study reports the safety and outcomes of MT beyond 24-hours of LKW compared to standard medical therapy (SMT).

Methods: This is a retrospective analysis of LVO patients presented to eleven comprehensive stroke centers in the US beyond 24-hours from LKW between 01/2015-12/2021.We assessed 90-days outcomes using the modified Rankin Scale (mRS).

Results: Of 334 patients presented with LVO beyond 24-hours, 64% received MT and 36% received SMT only. Patients who received MT were older (66±15 vs. 62±55 years, p= 0.047) and had a higher baseline NIHSS (16±7 vs.10±9, p=<0.001). Successful recanalization (TICI 2b-3) was achieved in 83%, and 5.6% had symptomatic ICH compared to 2.5% in the SMT group (p=0.19). MT was associated with mRS (0-2) at 90-days (aOR 5.73, p=0.02), less mortality 34 vs. 63% ($p<0.001$), and better discharge NIHSS (p=0.001) compared to SMT in patients with baseline NIHSS⩾6. This treatment benefit remained after matching both groups. Age (aOR 0.94, $p<0.001$), baseline NIHSS (aOR 0.91, p 0.01), ASPECTS score ⩾8 (aOR 3.06, p=0.04) and collaterals scores aOR (1.41, p=0.027) were associated with 90-day functional independence.

Conclusions: MT for LVO beyond 24-hours appears to improve outcomes compared to SMT, especially in patients with severe strokes. Patients' age, ASPECTS, collaterals, and baseline NIHSS score should be considered before discounting MT merely based on LKW.

Disclosure of interest: No

O009/1840

Scientific Communication SC3 - Neurointervention – Imaging and Reperfusion

IMPACT OF BRAIN ATROPHY ON BASELINE STROKE SEVERITY AND EARLY COURSE AFTER EVT IN PATIENTS WITH LVO STROKE

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Background and aims: Acute ischemic stroke patients with identical occlusion site, early ischemic changes, and collaterals can nevertheless have very different baseline stroke severity and post-EVT recovery. We sought to investigate the influence of cortical and subcortical brain atrophy on National Institutes of Health Stroke Scale (NIHSS) score at presentation and during the early neurologic course after EVT.

Methods: In this post-hoc analysis of the ESCAPE-NA1 trial, cortical and subcortical atrophy were assessed on non-contrast CT using the global cortical atrophy (GCA) scale and intercaudate-distance-to-inner-table-width (ICD/ITW) ratio, respectively. Associations with baseline NIHSS were tested using regression models adjusted for age, sex, pre-stroke modified Rankin Scale (mRS), stroke laterality, occlusion site, baseline Alberta Stroke Program Early CT score (ASPECTS) and collaterals score. Repeated measures of the NIHSS (days 0/1/2/5/30) were used to capture short-term neurologic trajectories.

Results: Among 1,102 participants (mean age of 69.5±13.7 years; 554 men), cortical atrophy was present in 284 (26%). Cortical atrophy was associated with higher baseline NIHSS (adjusted difference GCA1-3 vs GCA0=1.3, [95%CI:0.3-2.3]) compared to no atrophy.

In repeated-measures analyses, NIHSS scores improved over time in all patients, but were higher in patients with versus without atrophy (at 5/30 days for cortical atrophy at 1/2/5/30 days for subcortical atrophy patients in the two highest ICD/ITW-ratio quartiles).

Conclusions: In patients with brain atrophy, stroke severity was greater at presentation, despite accounting for baseline imaging characteristics, and early neurologic course after EVT was less favorable compared to patients without atrophy.

Disclosure of interest: No

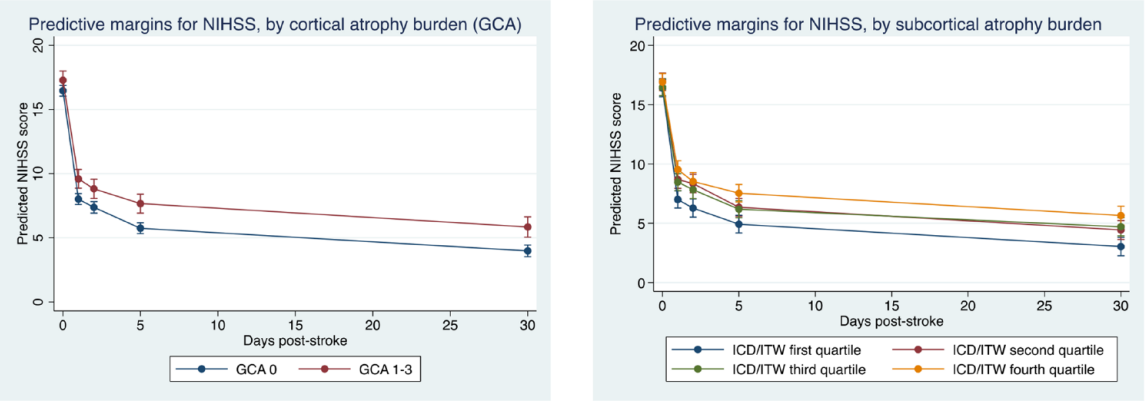

Figure 1 Predicted NIHSS scores (predictive margins) over time, up to 30 days post-stroke, by (A) cortical atrophy burden measured using the global cortical atrophy (GCA) scale, and (B) subcortical atrophy burden measured using the intercaudate-/inner-table-width (ICD/ITW) ratio, with the upper quartiles representing greater degrees of subcortical atrophy.

O010/2535

Scientific Communication SC3 - Neurointervention – Imaging and Reperfusion

INTRACRANIAL THROMBUS COMPOSITION PREDICTS EARLY REOCLUSSION AFTER SUCCESSFUL MECHANICAL THROMBECTOMY

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Background and aims: Our objective is to identify thrombus composition and related factors associated with unexpected early intracranial reocclussion after successful mechanical thrombectomy.
Methods: Endovascular treatments of patients with tandem occlusions were excluded. A total of 196 stroke patients with successful reperfusion (modified thrombolysis in cerebral infarction equal or greater than 2b) were included. Each thrombi obtained by MT were analyzed by Flow Cytometry analysis to provide main leukocyte composition: granulocytes, monocytes and lymphocyte populations. Thrombi analysis, baseline variables, antithrombotic treatment, etiology and reperfusion treatment were analyzed to identify predictors of early reoclussion in the first 48 hours after thrombectomy.
Results: Early reocclusion were observed in 6.1 %(12/196) of succesfully reperfused patients . Thrombi from patients with reoclussion had higher proportion of lymphocytes B [11.11 % (10.19-24.19) vs. 7.95 %(4.78-12.04); p = 0.005] in comparison to cases without reoclussion. Atherosclerotic etiology [2 (16,7%) vs. 6 (4,2%); p 0.059] and active smoking [4(33.3%) vs. 20 (13.9%) p =0.073] presented a positive trend with early reoclussion cases . In the logistic regression analysis adjusted by age, previous use of intravenous fibrinolysis, proportion of Lymphocytes B, atherosclerotic etiology and active smoking, the independent predictor of early reoclussion was the proportion of Lymphocyte B in intracranial thrombus (aOR 1.052, 95% CI 1.009- 1.098).
Conclusions: Rich–Lymphocyte B thrombus is and independent predictor of unexpected early reocclusion and a potential therapeutic target to improve angiographic outcome of endovascular stroke treatments.
Disclosure of interest: No

O011/179

Scientific Communication SC3 - Neurointervention – Imaging and Reperfusion

WHY NEUROPROTECTION SHOWS LARGE EFFECTS IN ANIMALS BUT HAS FAILED IN STROKE PATIENTS

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Background and aims: The "translational roadblock" between successful animal stroke studies and neutral clinical trials is usually attributed to conceptual weaknesses. However, we hypothesized that rodent studies cannot inform the human disease due to intrinsic pathophysiological differences between rodents and humans., i.e. differences in infarct evolution. Therefore, we aimed to compare the infarct evolution in rodents with and without neuroprotective treatments and in human stroke patients.
Methods: For animal data, we systematically searched pubmed to identify all rodent studies, in which stroke was induced by tMCAO and ⩾ sequential MRI scans were performed for infarct volume assessment within the first two days. For clinical data, we included 87 consecutive stroke patients with large artery occlusion, in whom a TICI 2b-3 thrombectomy was achieved and MRI scans were performed upon admission and 1-2 days later.

Results: A meta-analysis of animal data showed a median post-reperfusion infarct volume growth of 74% (Fig. 1A-B). Neuroprotective treatments reduced the median infarct volume growth to 23% (Fig. 1C-D). A retrospective clinical cohort study showed that stroke patients had a median infarct volume growth of only 2% (Fig. 1E-F).
Conclusions: Our study shows that rodents experience significant post-reperfusion infarct growth, and that this post-reperfusion infarct growth is the target of neuroprotective treatments. Stroke patients do not have such infarct growth and thus have no target for neuroprotection.

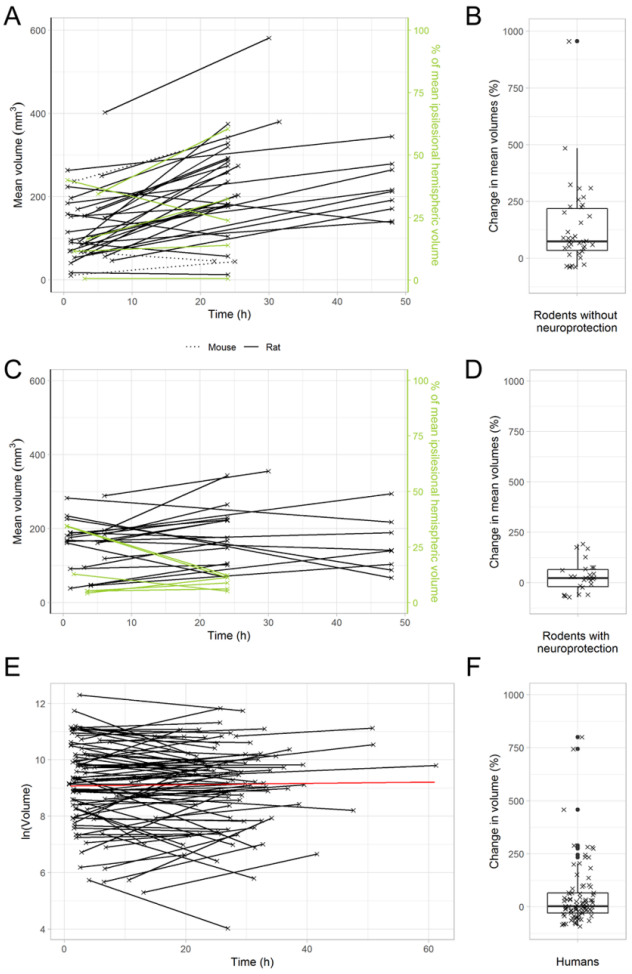

Figure 1: A-B Infarct growth in animals. C-D: Neuroprotective treatments minimize infarct growth in animals. E-F: There is no significant infarct growth in human stroke patients.

Disclosure of interest: No

O012/665

Scientific Communication SC3 - Neurointervention – Imaging and Reperfusion

CLINICAL AND ANGIOGRAPHIC OUTCOMES AFTER RESCUE STENTING FOR FAILED MECHANICAL THROMBECTOMY (RES-CAT STUDY)

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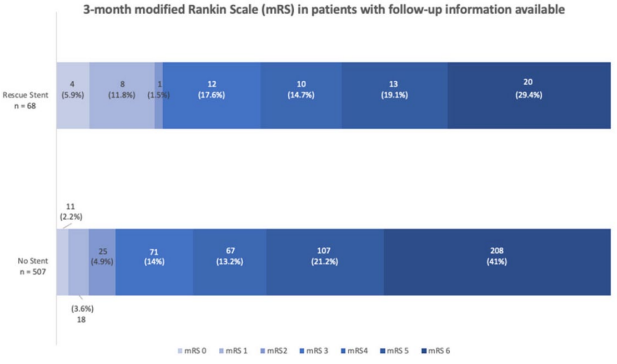
Background and aims: The role of intracranial rescue stenting (RS) after failed mechanical thrombectomy (MT) is still not established. We aimed to investigate RS's clinical and angiographic results in patients with large-vessel occlusion (LVO) with failed MT.
Methods: We conducted a retrospective analysis of the Stroke Code Registry of Catalonia (Spain), a prospective, population-based, mandatory registry including data from all consecutive patients treated at 10 comprehensive stroke centers. We identified patients with anterior circulation LVO affecting the terminal internal carotid artery or the M1/M2 segments of the middle cerebral artery with failed MT (mTICI0-2a) and compared clinical, safety, and angiographic outcomes in patients with and without RS. The primary endpoint was functional outcome assessed by the modified Rankin Scale (mRS) at 90 days. Shift analysis and multivariate analysis adjusted for age, prior mRS, and baseline NIHSS were performed.
Results: We included 634 patients (72.4±13.4 years, 50.6% women), 68 of whom received RS. Shift analysis showed better functional outcomes for the RS group (OR:0.56, 95%CI:0.36-0.90; p=0.015), but not in the multivariate analysis (aOR:0.77, 95%CI:0.48-1.24; p=0.283). Symptomatic intracranial hemorrhage was similar between groups (9.2%vs8.5%; p=0.832). Mortality at 90 days was higher in the non-RS group (27.9%vs.41.1%; p=0.037), but not in the multivariate analysis. Successful recanalization (mTICI2b-3) was achieved in 52 patients (72%). RS was significantly associated with fewer MT attempts and fewer subarachnoid hemorrhages (13.6%vs.38.6%) but not with vessel rupture or dissection rates.
Conclusions: RS is safe after failed MT. Randomized clinical trials are needed to investigate the impact on functional outcomes.



Disclosure of interest: No

O013/1012

Scientific Communication SC4 - Cardioembolism and Heart-Brain Interactions

OUTCOMES OF ATRIAL FIBRILLATION KNOWN BEFORE OR DETECTED AFTER ISCHEMIC STROKE: ROLE OF ANTICOAGULATION

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Background and aims: Atrial fibrillation(AF) known before ischemic stroke(KAF) has been postulated to be an independent category with a recurrence risk higher than that of AF detected after stroke (AFDAS). However, it is unknown whether this risk difference is confounded by pre-existing anticoagulation, which is most common in KAF and also indicates a high ischemic stroke recurrence risk.

Methods: Individual patient data analysis from 5 prospective cohorts of anticoagulated patients following AF-associated ischemic stroke. We compared the primary (ischemic stroke recurrence) and secondary outcome (all-cause death) among patients with AFDAS versus KAF and among anticoagulation-naïve versus previously anticoagulated patients using multivariable Cox, Fine-Gray models and goodness-of-fit statistics to investigate the relative independent prognostic importance of AF-category and pre-existing anticoagulation.

Results: Of 4,357 patients, 1,889(43%) had AFDAS and 2,468(57%) had KAF, while 3,105(71%) were anticoagulation-naïve before stroke and 1,252(29%) were previously anticoagulated. During 6,071 patient-years of follow-up we observed 244 recurrent strokes and 661 deaths. Only pre-existing anticoagulation (but not KAF) was independently associated with a higher hazard for stroke recurrence in both Cox and Fine-Gray models. Models incorporating pre-existing anticoagulation showed better fit than those with AF-category; adding AF-category did not result in better model fit. Neither pre-existing anticoagulation nor KAF were independently associated with death.

Conclusions: Our findings challenge the notion that KAF and AFDAS are clinically relevant and distinct prognostic entities. Instead of attributing an independently high stroke recurrence risk to KAF, future research should focus on the causes of stroke despite anticoagulation to develop improved preventive treatments.

Disclosure of interest: Yes

Figure 1. Kaplan-Meier and cumulative incidence curves for recurrent ischemic stroke according to (A) AF category and (B) anticoagulation before stroke

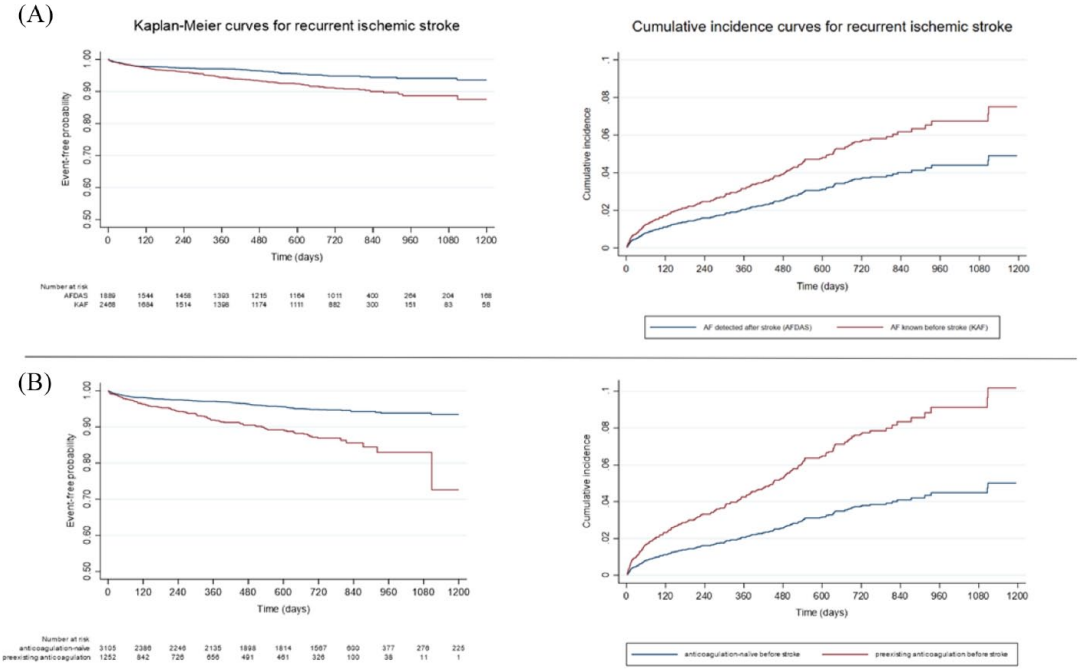
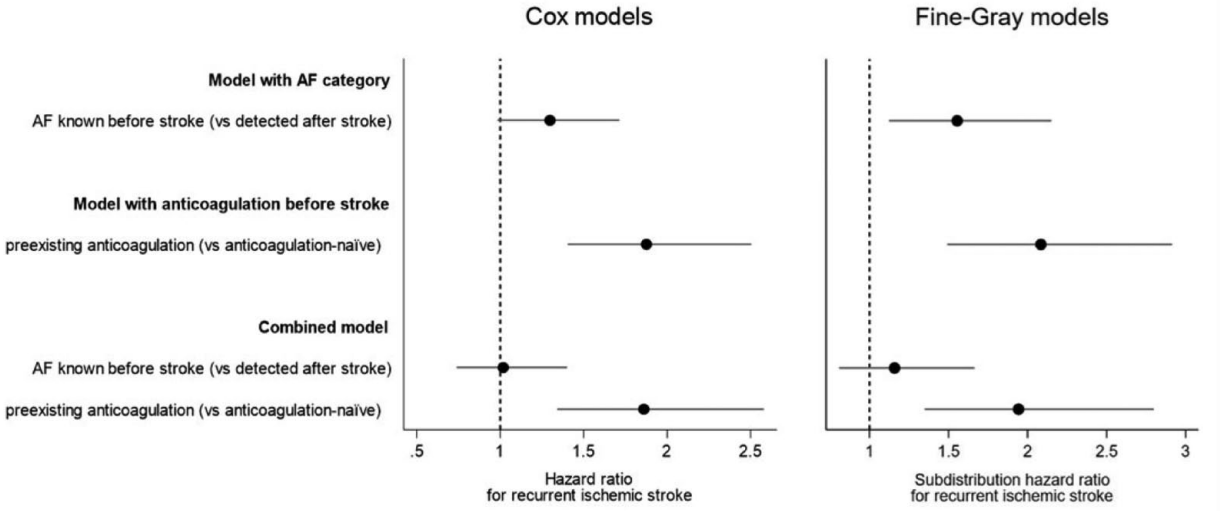


Figure 2. Adjusted hazard ratio estimates for the effect of AF category and anticoagulation before stroke on ischemic stroke recurrence from Cox and Fine-Gray models. When modelled separately, AF category shows a weaker association with ischemic stroke recurrence than anticoagulation before stroke. In the combined model, only anticoagulation before stroke but not AF category retains a strong association with ischemic stroke recurrence.



O014/1794

Scientific Communication SC4 - Cardioembolism and Heart-Brain Interactions

ATRIAL FIBRILLATION DETECTED ON 14-DAY CARDIAC MONITORING HAS A LOWER STROKE RECURRENCE RISK THAN EKG-DIAGNOSED AF

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Background and aims: Atrial fibrillation (**AF**) burden is associated with ischemic stroke (**IS**) risk. Recent meta-analyses suggest that AF detected after stroke (AFDAS) is a heterogeneous group of arrhythmias with an overall lower risk of stroke recurrence than AF known before stroke occurrence (**KAF**). We hypothesized that AFDAS found on 14-day cardiac monitoring (**AFDAS-CM**) entails a lower stroke recurrence risk than AFDAS identified on admission EKG (**AFDAS-EKG**). We compared IS recurrence between both types of AFDAS.

Methods: We included IS or transient ischemic attack (**TIA**) patients with AFDAS-CM (>30s) and AFDAS-EKG from the London Ontario Stroke Registry. The primary endpoint was recurrent IS. The primary safety endpoint was major bleeding. We used Cox proportional-hazards models adjusted for qualifying event type (IS vs. TIA), CHA_2DS_2-VASc score, anticoagulation, left ventricular ejection fraction (**LVEF**), left atrial volume index (**LAVI**), and high-sensitivity troponin T (**HS-TnT**) to estimate adjusted hazard ratios (**aHR**).

Results: We evaluated 384 patients (IS 326, AFDAS-CM 184). Mean age was 78.2±10.2 years. Net monitoring time was 12.5±6.0 days. AFDAS duration was 32±61 hours. Follow-up duration was 21.5±20.5 months. AFDAS-EKG was independently associated with a higher recurrent IS risk (aHR 4.8; 95%CI 1.1-21.7; p=0.042) without differences in major bleeding.

Conclusions: Recurrent IS risk was higher in AFDAS-EKG than AFDAS-CM, supporting the hypothesis that AFDAS identified on prolonged cardiac monitoring is a more benign type of arrhythmia EKG-diagnosed AF. We hypothesize that AFDAS-EKG is a higher burden AF with a similar risk profile as KAF. This hypothesis needs to be further evaluated.

Disclosure of interest: No

O015/1766

Scientific Communication SC4 - Cardioembolism and Heart-Brain Interactions

N-TERMINAL PRO B-TYPE NATRIURETIC PEPTIDE (NTproBNP) MAY HELP IDENTIFY PEOPLE WHO DO NOT NEED PROLONGED CARDIAC MONITORING AFTER STROKE

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Background and aims: Access to prolonged cardiac monitoring (PCM) to search for atrial fibrillation (AF) after stroke is limited. We assessed the utility of the blood biomarker N-terminal pro B-type natriuretic peptide (NTproBNP) to identify people who are unlikely to have AF after stroke and who may not need PCM.
Methods: We analysed people with ischaemic stroke (IS), no known AF and ⩾3 days cardiac monitoring in the BIOSIGNAL study (NCT02274727). We identified the NTproBNP concentration associated with 90% specificity for no AF. External validation was performed in the ongoing PRECISE study of 28 days cardiac monitoring after IS/TIA.
Results: The BIOSIGNAL cohort included 621 people: 243 (39.1%) were female, mean (SD) age was 67 (14) years and 77 (12.4%) had AF. NTproBNP concentration <58.5ng/l was associated with 90% specificity for no AF. NTproBNP was <58.5ng/l in 111 people (17.9%) and 104 of those (93.7%) did not have AF.
The PRECISE cohort included 239 people: 94 (39.3%) were female, mean (SD) age was 65 (13) years and 41 (17.2%) had AF. NTproBNP concentration <58.5 ng/l was associated with 92.7% specificity for no AF. NTproBNP was <58.5ng/l in 78 people (32.6%) and 75 of those (96.2%) did not have AF.
Conclusions: NTproBNP may help to identify people who are unlikely to have AF after stroke. Using a low NTproBNP level to "screen out" could reduce the number of people who need PCM and allow PCM to be focused on people who are more likely to have AF and benefit.
Disclosure of interest: Yes

O016/182

Scientific Communication SC4 - Cardioembolism and Heart-Brain Interactions

LEFT ATRIAL APPENDAGE OCCLUSION FOR PATIENTS WITH PRIOR STROKE: INSIGHTS FROM THE AMULET IDE TRIAL

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[1]*University Duisburg-Essen, N/A, N/A, Germany*, [2]*Tufts Medical Center, N/A, Boston, United States*, [3]*Vanderbilt Heart Institute, N/A, Nashville, United States*, [4]*Inselspital, University of Bern, N/A, Bern, Switzerland*, [5]*Mayo Clinic, N/A, Rochester, United States*, [6]*Kansas City Heart Rhythm Institute and Research Foundation, N/A, Kansas City, United States*

Background and aims: Patients with non-valvular atrial fibrillation are at increased risk of embolic stroke from thrombus in the left atrial appendage (LAA). LAA occlusion (LAAO) seals the LAA and reduces stroke risk in such patients. The Amulet IDE trial compared LAAO using the Amplatzer™ Amulet™ Occluder (Abbott) to the Watchman™ device (Boston Scientific). We compared clinical outcomes through 3 years in patients with and without a prior stroke who were enrolled in the Amulet IDE trial.
Methods: Patients at high risk of stroke, defined as CHA_2DS_2-VASc score of ⩾3, were randomized to LAAO with one of the 2 devices. Outcome ascertainment occurred at discharge, 45 days, 3, 6, 9, 12, and 18 months and then annually through 5 years.
Results: At 108 sites, 1833 patients underwent attempted LAAO (917 Amulet and 916 Watchman), of whom 349 (19.0%) had a history of prior stroke. At 3 years, clinical outcomes were similar between patients with and without prior stroke including TIA (2.7% vs. 2.1%, p=0.61), hemorrhagic stroke (0.9% vs. 0.6%, p=0.45), major bleeding (14.5% vs. 15.7%, p=0.62), cardiovascular death (8.4% vs. 7.4%, p=0.47), and all-cause death (18.3% vs. 15.8%, p=0.28). Annualized ischemic stroke rates at 3 years were reduced compared to the CHA_2DS_2-VASc anticipated rate for both patients with prior stroke (3.2%/year, 66% reduction compared to 9.5%/year) and without prior stroke (1.3%/year, 82% reduction compared 6.9%/year).
Conclusions: Clinical outcome events were similarly uncommon in patients with, and without, prior stroke through 3 years in the largest head-to-head randomized LAAO trial.
Disclosure of interest: Yes

O017/1663

Scientific Communication SC4 - Cardioembolism and Heart-Brain Interactions

CLINICAL CHARACTERISTICS AND TYPES OF MYOCARDIAL INFARCTION IN PATIENTS WITH POST-STROKE ACUTE MYOCARDIAL INJURY

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Background and aims: Post-stroke acute myocardial injury is present in 25% of patients and associated with a three-fold higher short-term mortality. It has been suggested that myocardial injury is rather caused by type 2 myocardial infarction (MI) -due to an imbalance in myocardial oxygen supply and demand- than type 1 MI. However, data about presence of type 2 MI and frequency of triggering factors are lacking.
Methods: Between 01/2019-12/2020, all consecutive patients with post-stroke acute myocardial injury (high-sensitivity Troponin-T> upper reference limit [URL] with a subsequent rise and/or fall >20%) were retrospectively screened for presence of predefined triggers of demand ischemia and for fulfillment of diagnostic criteria of MI.
Results: Among 250 analyzed patients with acute myocardial injury (mean age 79 years (±9.5), 50% female), 102 (40.8%) had at least one predefined trigger of demand ischemia (mainly severe hypertension, respiratory insufficiency, and sustained tachycardia). A probable trigger was identified in 58 patients. Patients with a fulfilled predefined trigger had higher stroke severity and more often insular cortex involvement (both p<0.05). Criteria of MI were fulfilled in 41 (16.4%) patients (n=15 type 1 MI, n=24 type 2 MI, n=2 unclassifiable MI). Serial hs-cTnT levels were higher (15.1-times vs. 4.6-times URL, p<0.03) in patients with type 1 compared to those with type 2 MI.
Conclusions: A high proportion of patients with post-stroke acute myocardial injury have evident triggers of type 2 MI. While higher serial hs-cTnT levels suggest type 1 MI, stroke-specific factors seem to be more prevalent in type 2 MI.
Disclosure of interest: No

O018/384

Scientific Communication SC4 - Cardioembolism and Heart-Brain Interactions

DOES A RISE AND/OR FALL IN TROPONIN VALUES INDICATE MYOCARDIAL INFARCTION IN ACUTE STROKE PATIENTS? - RESULTS OF THE PROSPECTIVE, OBSERVATIONAL MULTICENTER PREDICTION OF ACUTE CORONARY SYNDROME IN ACUTE ISCHEMIC STROKE (PRAISE) STUDY

Christian Nolte[1], Regina von Rennenberg[1], Simon Litmeier[1], David Leistner[2], Stephan Blankenberg[3], Gabor Petzold[4], Martin Dichgans[5], Katus Hugo[6], Burkert Pieske[7], Vera Regitz-Zagrosek[8], Tim Bastian Brämswig[1], Ida Rangus[1], Wegscheider Karl[9], Hot Amra[9], Eik Vettorazzi[9], Zeiher Andreas[10], Jan Scheitz[1], Ulf Landmesser[11], Matthias Endres*[1]

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Background and aims: Elevation of high-sensitivity cardiac troponin (hs-cTn) is common in patients with acute ischemic stroke and indicates poor prognosis. Medical implications however are unclear. The PRAISE study aimed to define diagnostic pathways for MI in stroke patients. Here, we report whether a rise and/or fall in hs-cTn values is useful to diagnose myocardial infarction (MI) in stroke patients.

Methods: In this prospective, multicenter, observational trial with predefined endpoints, acute ischemic stroke patients with elevated hs-cTn fulfilling the ESC rule-in criteria for invasive management in suspected NSTE-ACS underwent standardized ECG, echocardiography, and coronary angiography, all evaluated in core laboratories. Endpoints were type 1 MI, type 2 MI, or no MI diagnosed by an independent endpoint adjudication committee. Primary hypothesis was that a predefined dynamic change in hs-cTn (i.e., rise/fall pattern) ⩾ 50% indicates MI.

Results: A total of 254 patients were included. Endpoints were adjudicated in 247 patients (median age 75 years; 47% female). MI was present in 126/247 (51.0%) patients and classified as type 1 in 50/247 (20.2%) patients.

Dynamic change of hs-cTn was neither associated with MI in univariate (32% vs 38%; p=0.295) nor adjusted comparison (adj. OR=1.05 [0.31-3.33]). However, baseline absolute hs-cTn value was independently associated with type 1 MI (adj. OR 3.61; 95%CI 1.49-9.51 per unit).

Conclusions: In acute ischemic stroke, presence of a rise/fall pattern in hs-cTn values is not confined to MI. Interventional treatment trials in stroke patients may aim to include type 1 MI and focus on absolute hs-cTn as inclusion criterion.

Disclosure of interest: Yes

O019/527

Scientific Communication SC5 - Rehabilitation after Stroke

SUSTAINED SAVING OF POST-STROKE RECOVERY TIME BY NEUROAID

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Background and aims: Progress has been made in the acute treatment of ischemic stroke through revascularization procedures, but many stroke victims remain disabled worldwide. MLC601 (NeuroAiD), a natural oral formulation, has demonstrated long-term clinical efficacy on post-stroke recovery. We sought to analyse time-saving to achieve post-stroke functional recovery (FRec).

Methods: Based on data from a double-blind, placebo-controlled study of a 3-month course of MLC601, Time to FRec was measured by the time required to achieve a score of 0 or 1 on the modified Rankin Scale (mRS) over a 2-year follow-up. Time to FRec was analysed by Kaplan-Meier method. Cumulative incidence curves were provided for both groups and compared using log-rank test. Hazard ratios (HR) of MLC601 versus placebo along with 95% CI were calculated using the Cox proportional hazards model adjusted for prognostic factors.

Results: 548 patients with baseline NIH-Stroke-Scale (NIHSS) score from 8 to 14, an mRS score ⩾2 at day-10 post-stroke, and at least one mRS assessment at month-1 or later was included in the analysis (placebo=261; MLC601=287). Time to FRec was shortened with MLC601 versus placebo (log-rank test: p=0.039), this result being confirmed by a favourable trend in Cox regression (HR: 1.30 [0.99, 1.70]) and higher success rates in patient subgroups (b-NIHSS⩾10, time-to-treatment, rehabilitation). Kaplan-Meier analysis showed about 40% cumulative incidence of FRec was achieved within 6 months post-stroke with MLC601 versus 24 months with placebo.

Conclusions: MLC601 reduced the time to achieve FRec versus placebo, with a clinically significant time-saving of approximately 18 months.

Disclosure of interest: No

O020/1548

Scientific Communication SC5 - Rehabilitation after Stroke

FACTORES ASOCIADOS A CAÍDAS EN ADULTOS MAYORES CON ACCIDENTE CEREBROVASCULAR EN LA POBLACIÓN COLOMBIANA SEGÚN ENCUESTA SABE

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Background and aims: Falls are a common complication in stroke patients: 36-73% fall during the first 6 months, and 50% continue falling 10

years after stroke. In order to create intervention programmes to impact on morbidity and mortality it is essential to identify fall-associated factors.

Methods: Cross-sectional study with analytical intention was conducted as a secondary analysis of the SABE-Colombia 2015 survey, including patients over 60 years of age and stroke. A multiple correspondence analysis (MCA) and bivariate analysis adjusted by Poisson regression were employed.

Results: N= 976 patients. The MCA showed female sex and benzodiazepine use clustered more closely around falls, followed by any kind of rehabilitation, history of hypertension, arthritis/arthrosis, fear-of-falling, urban housing and loneliness. Bivariate analysis showed association of falls with benzodiazepines use (PR 1.089; p= 0.012), poor health self-perception (PR 1. 065; p= 0.001), history of arthritis/arthrosis (RR 1.048; p= 0.042), fear-of-falling (RR 1.087; p= 0.001), rehabilitation (RR 1.043; p= 0.038) and female sex. Multivariate analysis showed male sex and preserved hearing (PR 0.945; p= 0.040, PR 0.924; p=0.018) had lower prevalence of falls, and poor health self-perception (PR 1.041; p= 0.025) had an increased risk.

Conclusions: Fear-of-falling and poor health self-perception are crucial intervention targets in these patients. Benzodiazepine use, and sensory assessment (auditory, visual) should be considered during follow up. Intervention programmes and randomized clinical trials are needed to assess these potential targets' efficiency.

Disclosure of interest: Yes

O021/456

Scientific Communication SC5 - Rehabilitation after Stroke

ENGAGING STROKE SURVIVORS IN LIFESTYLE CHANGE TO REDUCE STROKE RECURRENCE RISK FACTORS. ENGAGEMENT AND POTENTIAL FOR EFFECT IN THE ENABLE PILOT TRIAL

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Background and aims: Sustained lifestyle change is needed to reduce stroke recurrence. We evaluated engagement and potential for effect of co-designed lifestyle interventions for people after stroke.

Methods: The ENAbLE Pilot telehealth-delivered 4-arm randomised trial (trial registration ACTRN12620000189921) included adults 3 months to 10 years after stroke or transient ischaemic attack evaluating the six-month lifestyle programs (diet [DIET] and/or physical activity [PA]). Engagement measures included recruitment rate, adherence, participant perception of the programs' effect on their health and change in diet and physical activity. Potential for effect was evaluated via changes in stroke risk factors (blood pressure, diet quality and physical activity).

Results: Ninety-nine people were screened over 22 months. Forty participants were randomised to one of the 4 study arms (DIET n=10, PA n=10, DIET&PA n=10, Control=10). Participants attended a median (IQR) 9 (8 to 10) of a possible 10 DIET sessions, and 31 (26 to 34) of a possible 36 PA sessions. Overall mean (SD) satisfaction for the DIET and PA interventions was 9(1), while the control group mean (SD) was 7(2) from a maximum score of 10. Ninety-one percent of DIET and PA participants felt the program had changed diet or physical activity compared with 40% in the control group and 86% of DIET and PA participants agreed the program improved their health compared with 40% in the control. Preliminary evaluation of stroke risk factors showed trends favouring the lifestyle interventions.

Conclusions: The ENAbLE pilot had high levels of engagement and preliminary results suggest potential for effect.

Disclosure of interest: No

O022/1833

Scientific Communication SC5 - Rehabilitation after Stroke

LATEROPULSION RESOLUTION UP TO ONE YEAR POST STROKE: A PROSPECTIVE, LONGITUDINAL COHORT STUDY

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Background and aims: Post-stroke lateropulsion affects approximately half of stroke survivors and is associated with poor rehabilitation outcomes and reduced functional independence. Data regarding long-term persistence of post-stroke lateropulsion are lacking. This study explored long-term resolution of lateropulsion to twelve months post-stroke.

Methods: This prospective, longitudinal cohort study conformed to the STROBE Statement for observational studies. Consecutive admissions to an inpatient Stroke Rehabilitation Unit (SRU) (n=150) were recruited. Lateropulsion severity assessments (Four Point Pusher Score – 4PPS) were conducted at SRU admission and discharge, then three, six, nine, and twelve months post-stroke. Participation in rehabilitation physiotherapy was recorded at each assessment.

Results: Evidence of lateropulsion (4PPS$\geqslant$1) was recorded in 81 participants (54%) on SRU admission (median 4PPS=3). Fifty-seven (70%) of those with lateropulsion on admission showed persistent lateropulsion on discharge (mean 57.26 days post-stroke). Odds of 4PPS=0 (complete lateropulsion resolution) increased significantly over time among participants who received rehabilitation physiotherapy (odds ratio (OR): 9.7, 28.1, 43.1, 81.3 ($p<0.001$) at three, six, nine and twelve months post-stroke, respectively). Among participants who did not receive rehabilitation physiotherapy, odds of lateropulsion resolution were not significant ($p>0.05$) between discharge and nine months, but odds of complete resolution at twelve months post-stroke were significantly greater than at discharge (OR: 8.0, p=0.010).

Conclusions: This novel study found that a higher proportion of participants who received rehabilitation physiotherapy showed complete lateropulsion resolution earlier than those who did not receive rehabilitation physiotherapy. Findings have implications for the long-term resource and rehabilitation needs of people with post-stroke lateropulsion.

Disclosure of interest: No

O023/1398

Scientific Communication SC5 - Rehabilitation after Stroke

IMPACT OF INTENSE PHYSICAL THERAPY ON MOBILITY OUTCOMES IN ACUTE STROKE (NCT04778475)

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Background and aims: To evaluate the impact of increased intensity and frequency of Physical Therapy (PT) treatment on acute stroke patients. We hypothesize that the treatment group will demonstrate significant improvements on the Activity Measure for Post Acute Care (AMPAC), Postural Assessment Stroke Scale (PASS), & Modified Rankin Scale (mRS) from admission to discharge and 90-day follow up compared to control.
Methods: 100 patients were randomly assigned within 24 hours of stroke admission into treatment or control groups. The treatment group received BID treatment sessions 3/5 days post stroke & QD thereafter. The control group received QD treatment 3-5 days/week focusing on bed mobility, transfers and locomotion. The treatment group received error augmentation training emphasizing impairments throughout mobility rather than facilitating normal movement patterns. The PASS, AMPAC, and mRS were each evaluated using a 2-factor, repeated measures ANOVA.
Results: The treatment group PASS score improved 10.23 points while the control group improved 5.78 points admission to discharge; main effect for interaction ($p=0.0001$). The treatment group AMPAC improved 4.65 points while the control group improved 1.9 points; main effect for interaction ($p=0.01$). The treatment group mRS decrease was 0.7 treatment compared to a 0.3 for the control group; main effect for interaction ($p<0.0001$). There was one significant adverse event in the treatment group. PASS and AMPAC scores were maintained in both groups at 90 days post-stroke, while the mRS decreased similarly in each group.
Conclusions: Increased frequency with a focus on error augmentation demonstrated significant improvements in functional outcomes post stroke.
Disclosure of interest: No

O024/1645

Scientific Communication SC5 - Rehabilitation after Stroke

PREDICTION OF PATIENT SOCIAL RISK AT DISCHARGE FROM A REHABILITATION HOSPITAL

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Background and aims: After stroke rehabilitation, patients need to reintegrate back to their daily life, workplace and society. Reintegration involves complex processes depending on age, sex, stroke severity, cognitive, physical, and socio-economic factors that impact patients' lives. Social risks and barriers to successful reintegration are poorly understood yet critical for informing clinical or social interventions. Therefore, the aim of this work is not only to predict social risk at discharge from rehabilitation, but also identify factors that contribute to this risk.
Methods: Gradient Boosting Machine methodology based on decision trees was applied to a Catalan 217-patient cohort of mostly young, male, ischemic stroke survivors, utilizing 16 different demographic, diagnostic and social risk variables (family support, social support, economic status, cohabitation and home accessibility). To correct for imbalance in patient sample numbers with high and low risk (prediction target), five models were built with varying subsampling methodology to predict social risk upon discharge from rehabilitation.
Results: The training and validation results indicated that the models corrected for prediction target imbalance have similar good performance (AUC [0.827–0.843], accuracy [0.811–0.880], specificity [0.839–0.855], sensitivity [0.800–0.897]). Furthermore, predictor variable importance ranked social support and economic status as most important variables with greatest contribution to social risk prediction, however, sex and age had lesser contribution.
Conclusions: Due to the complex and multifactorial nature of social risk, factors in combination, including social support and economic status, increase social risk for individuals.
This work was funded by H2020 grant agreement No.777107 (https://precise4q.eu).
Disclosure of interest: No

O025/1878

Scientific Communication SC5 - Rehabilitation after Stroke

CLINICAL PRACTICE GUIDELINES (CPGS) FOR STROKE REHABILITATION FROM LOW- AND MIDDLE-INCOME COUNTRIES (LMICS): A SYSTEMATIC REVIEW OF THE LITERATURE

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Background and aims: It is reported that stroke rehabilitation Clinical Practice Guidelines (CPGs) from low and middle income countries (LMICs) recommend interventions with low evidence, exclude interventions even when its benefits outweigh harms and include recommendations for interventions which have high evidence of hazards. Till date, there are no published reviews that have evaluated the quality of CPGs from LMICs or provided any insights into the cultural variation, adaptations, or gaps in implementation specific to LMICs. Therefore, the objective of this systematic review is to identify and evaluate the quality of CPGs developed by LMICs for stroke rehabilitation using AGREE-II and AGREE-REX tool.

Methods: Following the PRISMA-P guidelines, searches were conducted across 4 databases with a well-defined search strategy. Based on a predefined selection criteria nine reviewers screened the articles. Selected CPGs were compared against the AGREE-II and AGREE-REX (Appraisal of Guidelines for Research & Evaluation) instruments.
Results: 4099 articles were screened for eligibility and 6 included for data extraction. All 6 included CPGs scored poorly on the AGREE-II and AGREE-REX instruments showing poor methodological rigor and clinical implementability/credibility.
Conclusions: The lack of specificity, clinical applicability, regional adaptability in addition to knowledge translation and program implementation of CPGs have caused poor uptake of CPGs into practice in LMICs subsequently causing poor evidence-based practice. To build a momentum towards improved stroke rehab, these gaps need to be addressed.
Disclosure of interest: No

O026/1591

Scientific Communication SC6 - Service Organisation and Quality Improvement

ECONOMIC EFFICIENCY IN ENABLING ACCESS TO MECHANICAL THROMBECTOMY: A GLOBAL DISPARITY REPORT FROM MISSION THROMBECTOMY (MT 2020-PLUS)

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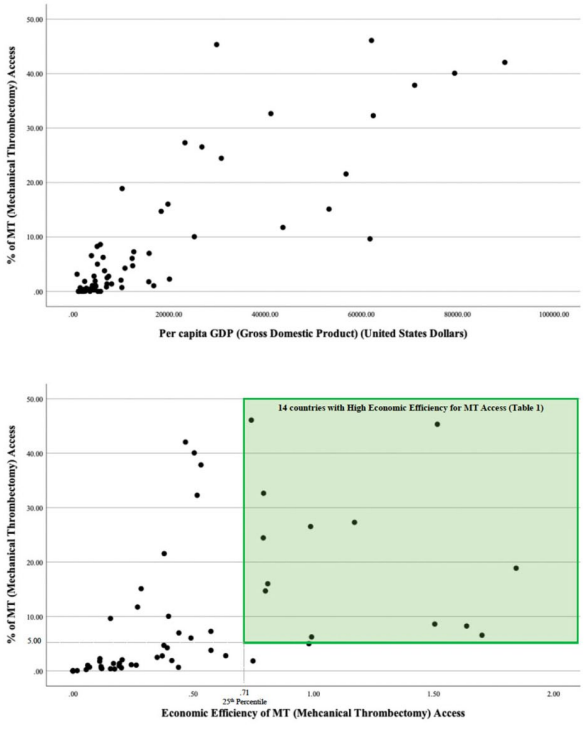
Background and aims: Despite the well-known relationship between a country's GDP and availability of healthcare facilities, economic efficiency in delivering healthcare is widely variable. Economically efficient models of stroke care delivery, especially for emergency mechanical thrombectomy (MT) for ischemic stroke, have not been studied. We analyzed data from the MT2020+ worldwide survey to characterize the economic efficiency for MT access, disparities between countries, and its determinants on a global scale.
Methods: MT2020+ survey was conducted in 75 countries. MT Access(MTA) was defined as proportion of estimated LVO patients receiving MT. Economic Efficiency of MT access(EE-MTA) was defined as a ratio of MT access divided by per-capita GDP of the country [EE-MTA=(MT Access)/(per-capita GDP/1000)]. Countries in the top 25th-percentile of EE-MTA and MT Access of >=5% were High EE-MTA. Univariable and multivariable analyses were performed.
Results: We analyzed 61 countries with 875 complete responses. Median global MTA was 2.79%(IQR-0.70-11.74). Turkey and Mexico have similar per-capita GDP(~$10,000) but MT access rates are 19% and 0.7%, respectively. Median global economic efficiency for MT access (EE-MTA) was 0.37(IQR-0.11-0.71) with wide-variation between countries(Figure-1). 14 countries had high EE-MTA[Figure-1;Table-1]. Table-2 presents univariable comparison between high and low EE-MTA countries. MT operator-center availability, MT reimbursement, and developed pre-hospital stroke systems were independent predictors of high EE-MTA.
Conclusions: There is striking disparity among countries in economic efficiency in providing access to MT despite similar GDP per capita. Significant determinants of superior economic efficiency include higher MT operator and center availability, developed pre-hospital stroke systems, and MT reimbursement facility.

Figure 1. Scatter plot countries using MT Access, per capita GDP, and Economic Efficiency of MT Access



[Highlighted in green are countries with High Economic Efficiency of MT Access- Top 25th percentile of economic efficiency and >=5% MT Access; Listed in Table 1]

Table 1. Countries with High Economic Efficiency of MT Access (EE-MTA) [Top 25th percentile of economic efficiency and ³5% MT Access]

	Country	Economic efficiency [MTA / (GDP per capita/1000)]	% MT Access	GDP per capita (thousands USD)
1	Turkey	1.84	18.8	10238
2	Vietnam	1.70	6.6	3854
3	Georgia	1.64	8.3	5035
4	Bahrain	1.52	45.3	29898
5	Jordan	1.51	8.6	5718
6	Slovakia	1.17	27.3	23305
7	Colombia	0.99	6.2	6289
8	Czech Republic	0.99	26.5	26836
9	Mongolia	0.98	5	5095
10	Uruguay	0.81	16	19773
11	Poland	0.80	14.7	18363
12	Japan	0.79	32.7	41174
13	Slovenia	0.79	24.5	30874
14	Australia	0.74	46.1	62107

Table 2. Comparison of characteristics between countries with high and low economic efficiency for MT access (EE-MTA)

	High EE-MTA (n=14)	Low EE-MTA (n=47)	P value
% MT Access	20.4 ±14	6.1 ±10	<0.001
Economic Efficiency for MT Access	1.2 ±0.3	0.3 ±0.2	<0.001
MT Operator Availability	46 ±17	17 ±16	<0.001
MT Center Availability	63 ±50	24 ±23	<0.001
% of GDP spent on healthcare	7.1 ±2.1	6.1 ±2.8	0.17
Reimbursement available for MT	79%	45%	0.02
Public service announcement for MT	93%	76%	0.26
National stroke protocol	57%	28%	0.04
Developed pre-hospital stroke triage	100%	72%	0.02
Known cultural barriers	43%	66%	0.12
EMS training for LVO triage	43%	34%	0.54

Disclosure of interest: No

O027/849

Scientific Communication SC6 - Service Organisation and Quality Improvement

QUALITY IN ACUTE STROKE CARE (QASC) GERMANY PROJECT: IMPROVING EFFICIENCY IN STROKE UNITS WITH NURSE-INITIATED PROTOCOLS TO MANAGE FEVER, HYPERGLYCEMIA AND SWALLOWING POST-STROKE

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Background and aims: Assisted implementation of nurse-initiated protocols to manage **fe**ver, hyperglycaemia and **s**wallowing (**FeSS**) following stroke significantly reduces 90-day death and disability. An international collaboration, between Nursing Research Institute, Australian Catholic University; European Stroke Organisation; Saarland University of Applied Sciences; and **I**nterdisciplinary **N**euro**V**ascular **N**etwork Rhein-Main; aimed to implement the FeSS protocols into German stroke units.

Methods: This multi-centre, pre-test/post-test study was conducted between 2020-2022. Data were collected using REDCap at baseline and three months post-implementation. Nurses, with project team support, conducted multidisciplinary facilitator workshops, developed action plans and conducted education sessions.

Results: Data from eight INVN-hospitals was obtained for 771 patients (baseline), and 679 patients (post-implementation) (n=1450). There were significant improvements in treatment with anti-pyretics for first temperature >37.5°C (Pre 35%; Post 67%, $p<0.0001$); blood glucose monitoring on day of admission (Pre:77%; Post:78%, p 0.0007); day two of admission (Pre: 53%; Post:70%, $p<0.0001$); treatment with insulin for first episode of hyperglycaemia BGL ⩾200mg/dL (Pre:48%; Post:66%, $p<0.0080$) and within one hour of first BGL ⩾200mg/dL (Pre:76%; Post:90%, $p<0.0001$); number of formal swallow screens performed (Pre:69%; Post:75%, $p<0.0001$) and number performed within 24 hours of admission (Pre:91%; Post:98%, $p<0.0308$).

Conclusions: While German stroke units report high standards of stroke care, these findings demonstrate that the introduction of nurse-initiated FeSS protocols supported by implementation science strategies, increased uptake of evidence-based care for the common post stroke complications of fever, hyperglycaemia and swallowing difficulties. The next challenge is to maintain these improvements to ensure that benefits to stroke patients are sustained.

Disclosure of interest: Yes

O028/274

Scientific Communication SC6 - Service Organisation and Quality Improvement

MECHANICAL THROMBECTOMY OUTCOMES IN PATIENTS WITH ACUTE LARGE VESSEL OCCLUSION IN THE UNITED STATES BEFORE AND AFTER TIME WINDOW EXPANSION (6-24 HOURS)

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Background and aims: In 2018, the time window for mechanical thrombectomy (MT) eligibility in acute ischemic stroke patients increased from 6 to 24 hours from symptom onset. The aim of this study is to evaluate the effect of MT window expansion on procedural and hospital volumes, and patient outcomes in nationally representative dataset from a United States.

Methods: We analyzed the National Inpatient Sample for acute ischemic stroke patients undergoing MT. We compared procedural volumes, hospital volumes, and patient outcomes between 2017 and 2019. The primary outcome was discharged home/self-care. The secondary outcomes were in-hospital mortality and post-procedural intracranial hemorrhage percentage.

Results: There was an increase in MT procedures for ischemic stroke from 23,865 (2017) to 36,710 (2019). The number of hospitals performing MT has increased from 801 (2017) to 855 (2019) and so has the number of those performing $\geqslant$50 procedures per year from 166 (2017) to 305 (2019) ($p<0.001$). Significant reduction in the odds of in-hospital mortality (OR 0.83 95%, CI 0.73-0.95, p=0.005) and significant increase in the odds of intracranial hemorrhage (OR 1.20 95% CI 1.09-1.32, $p<0.001$) was seen in 2019 compared to 2017; no change in the odds of discharge to home was identified.

Conclusions: The window expansion for MT in acute ischemic stroke patients has resulted in an increase in both procedural and hospital volumes with significant reduction in in-hospital mortality in the USA despite a significant increase in intracranial hemorrhage.

Disclosure of interest: No

O029/1804

Scientific Communication SC6 - Service Organisation and Quality Improvement

VALIDATE: VALIDATION OF ARTIFICIAL INTELLIGENCE TO LIMIT DELAYS IN ACUTE STROKE TREATMENT AND ENDOVASCULAR THERAPY

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Background and aims: Mechanical thrombectomy is a highly effective treatment for large vessel stroke (LVO). Rapid detection of LVOs and notification of neurointerventionalist (NIR) is imperative. The utilization of artificial intelligence in the detection of LVOs holds great promise for expediting identification and treatment.

Methods: Acute telestroke consultations seen by TeleSpecialists, LLC physicians at 166 facilities (17 states) utilizing Viz.ai software (AI) vs did not use AI software ("non-AI") from December 1, 2021 through March 31, 2022 were extracted from the Telecare™ database. Facilities in which neurology does not initiate NIR contact were excluded.

Results: A total of 14,116 patients (8,557 AI and 5,550 non-AI) were included. The median door to NIR notification time for AI was 50 min (40,82) and non-AI was 89.5 min (59.2, 122), (delta = 39.5 min; $p<0.001$). The median door to NIR notification for AI at thrombectomy centers (TC) was 44 min and non-AI at TC was 78 min ($p<0.001$). The median door to NIR notification for AI at non-thrombectomy centers (non-TC) was 64 min and for non-AI at non-TC was 97 min ($p<0.001$). There was a higher percentage of advanced imaging and LVO detected with AI at TC but not at non-TC.

Conclusions: This large, multicenter, first of its kind study demonstrated a 39.5 min faster timeline for patient ED arrival to contact with NIR and a greater than 30 min reduction in notification to NIR despite thrombectomy center status in facilities utilizing the AI software.

Disclosure of interest: Yes

O030/1748

Scientific Communication SC6 - Service Organisation and Quality Improvement

INTERNATIONAL COMPARISON OF CHARACTERISTICS, QUALITY OF CARE, AND IN-HOSPITAL OUTCOMES AMONG PATIENTS WITH ACUTE ISCHEMIC STROKE RECEIVING REPERFUSION THERAPY IN JAPAN AND THE UNITED STATES

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Background and aims: Intravenous thrombolysis (IVT) and endovascular thrombectomy (EVT) play a critical role in improving outcomes for patients with acute ischemic stroke (AIS), yet there is incomplete assessment of patient characteristics and quality of care of reperfusion therapy for most world regions.

Methods: We analyzed AIS patients receiving reperfusion therapy (IVT and/or EVT) in Close The Gap-Stroke, J-ASPECT Study in Japan (N=30,936, 53% EVT with/without IVT) and GWTG-Stroke Registry in the US (N=315,726, 28% EVT with/without IVT) from 2016 to 2019. Baseline characteristics and adherence to evidence-based quality metrics among eligible patients were compared between those treated in Japan and the US using standardized difference.

Results: Compared with their US counterparts, patients treated in Japan were older, had a lower prevalence of cardiovascular risk factors (except

for atrial fibrillation), presented with more severe strokes, and were more likely to arrive by emergency medical services (Table 1). Adherence to evidence-based performance measures and timeliness of IVT and/or EVT are shown in Table 2. Although Japanese patients experienced more sICH (6.9% vs. 3.6%), had fewer substantial reperfusion (TICI⩾2b 80.3% vs. 88.3%), and longer length of stay, there were no significant differences in unadjusted rates of in-hospital mortality (8.7% vs. 7.3%) and mRS 0-2 at discharge (37.7% vs. 39.2%).

Conclusions: We found significant differences in clinical characteristics and gaps in adherence to key performance measures between patients receiving reperfusion therapy in Japan and US. Additional efforts are needed to improve the quality of stroke care and outcomes in both nations.

Table 1. Baseline Characteristics between Patients Receiving Reperfusion Therapy in Close The Gap-Stroke, J-ASPECT Study in Japan and the Get With The Guidelines-Stroke Registry in the United States

	Close The Gap-Stroke, J-ASPECT (N=30,936)	GWTG-Stroke (N=315,726)	Standardized Difference*
Demographics			
Age, median (IQR), y	78 (69-85)	70 (59-80)	52.1
Female, %	43.7	49.2	-11.1
Stroke etiology, %			
Large-artery atherosclerosis	23.6	26.8	-7.3
Cardioembolism	58.5	33.1	52.8
Small-vessel occlusion	4.3	11.8	-27.8
Stroke of other determined etiology	9.5	4.5	19.8
Cryptogenic stroke	3.5	23.8	-62.0
Medical history, %			
Atrial fibrillation/flutter	45.7	20.1	56.8
Coronary artery disease/myocardial infarction	1.6	21.9	-66.4
Carotid stenosis	4.3	2.7	8.8
Dyslipidemia	26.6	43.2	-35.5
Diabetes	20.6	28.7	-18.9
Heart failure	11.3	9.8	5.1
Hypertension	55.6	71.2	-32.8
Obesity/overweight	22.6	26.3	-8.7
Smoker	14.7	17.9	-8.7
Arrival by emergency medical services, %	82.9	52.6	68.4
Initial NIHSS, median (IQR)	14 (7-21)	8 (4-16)	42.9
Reperfusion therapy, %			
Intravenous thrombolysis (IVT) only	47.1	72.0	-52.3
Endovascular thrombectomy with or without IVT	52.9	28.0	52.3
Hospital characteristics, median (IQR)			
Bed size	453 (306-630)	415 (259-640)	-0.3
Annual ischemic stroke volume	271 (175-413)	306 (202-458)	-9.3
Annual IVT volume	11 (6-20)	35 (21-49)	-121.8
Annual EVT volume	7 (2-15)	15 (0-33)	-54.7

* An absolute standardized difference >10 indicates meaningful difference between patients receiving reperfusion therapy in Japan and the United States.

Table 2. Adherence to Evidence-based Performance Measures and Unadjusted In-hospital Outcomes

	Close The Gap-Stroke, J-ASPECT (N=30,936)	GWTG-Stroke (N=315,726)	Standardized Difference*
Performance Measures, %			
Door-to-imaging time ≤25 min	78.0	79.8	0.4
IVT arrival by 3.5 hr and treated by 4.5 hr	46.9	98.7	-143.3
Door-to-needle time ≤60 min	47.0	82.2	-79.2
EVT for potential eligible patients	92.1	93.4	-5.0
Door-to-puncture time ≤90 min	52.0	61.4	-19.1
Substantial reperfusion (TICI ≥2b)	80.3	88.3	-22.1
Venous thromboembolism prophylaxis	77.2	99.2	-72.6
Antithrombotics at discharge	58.0	99.3	-117.0
Anticoagulation for atrial fibrillation at discharge	64.9	97.4	-91.3
Statin at discharge	22.5	99.0	-251.4
Smoking cessation	54.0	98.3	-121.8
Dysphagia screen	78.8	94.6	-47.8
Rehabilitation assessment	94.4	99.7	-31.8
Stroke education	74.9	98.0	-71.8
In-hospital outcomes, %			
Symptomatic intracranial hemorrhage within 36 hr after reperfusion therapy	6.9	3.6	14.6
In-hospital mortality	8.7	7.3	5.1
Discharge to hospice	4.5	5.4	-4.3
Discharge to home	34.2	46.1	-24.3
Modified Rankin scale 0-2 at discharge	37.7	39.2	-3.1
Length of stay, median (IQR), d	22 (14-36)	4 (3-7)	119.8

* An absolute standardized difference >10 indicates meaningful difference between patients receiving reperfusion Therapy in Japan and the United States.

Disclosure of interest: No

O031/2629

Scientific Communication SC6 - Service Organisation and Quality Improvement

THE DELIVERING OF THROMBOLYSIS AND MECHANICAL THROMBECTOMY IN UKRAINE DURING THE WAR

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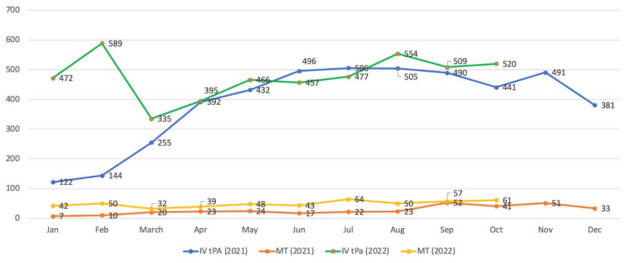
Background and aims: After the beginning of the war in Ukraine in 2022 stroke care struggled across the whole country despite increasing number of all types of strokes. In the middle of the year healthcare system adopted to the war times and stroke care improved.

Methods: We compared numbers of IV tPA and MT for ischaemic stroke in 2021 year and during the first 10 months of 2022 year according to National Health Service of Ukraine date from all Ukrainian stroke units and centres to understand how war can change providing reperfusion therapy in country that suffers the war.

Results: During the first month of war (March) we can see that number of IV tPA dropped by 46%. In May situation with refugees, medical stuff, devices for MT and drugs stabilized and number of procedures start increasing and reached the same numbers that were observed in 2021 year. Since August we see even more tPA procedures done than in 2021year.

Regarding MT we can see that even the beginning of the war didn`t have such a huge impact as we saw with tPA (just decrease of procedures by 36% in March) and all the months of 2022 year were better than in 2021 year.

Conclusions: So we can conclude that the war had only short-term (1-2 months) negative impact on stroke care. And with correct management of healthcare system all people of Ukraine still have a chance for the best stroke service even during the war.



Disclosure of interest: No

O032/843

Scientific Communication SC6 - Service Organisation and Quality Improvement

CHARACTERISTICS OF IN-HOSPITAL STROKE PATIENTS IN SWEDEN: A NATION-WIDE REGISTER BASED STUDY

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Background and aims: Characteristics of admitted patients who develop in-hospital stroke (IHS) are under-reported, including the main reason for hospitalization and invasive procedures before the stroke.

Methods: All adults with IHS in Sweden during 2010-2019 registered in Riksstroke were included and the cohort was cross-linked with the National Patient Register. Data was retrieved on registered background diagnoses. For the hospitalization when IHS occurred as well as any

hospital-based healthcare contacts within 30 days before stroke onset, main discharge diagnoses and all procedural codes were collected.
Results: In total 12,551 patients with IHS were included. Mean age was 76 years, 51% were female and the most common comorbidity was hypertension (66%). 91% had ischemic stroke and 9% had hemorrhagic stroke.
35% had at least one invasive procedure prior to ictus and 26% were hospitalized at least once within 30 days before IHS. In total, 12% had a cardiovascular or neurosurgical procedure, 7% an orthopaedic procedure and 5% had an endoscopy. There were 7% who had only minimally invasive procedures such as blood product transfusion, hemodialysis, or arterial or central line insertion. The most common main discharge diagnoses were circulatory system disorders (excluding stroke), injuries, and neoplastic disorders.
Conclusions: The previously reported major risk factors for in-hospital stroke, cardiovascular and neurosurgical procedures, were preceding IHS in only 12% of cases, thus suggesting that IHS vigilance is important outside of the fields of cardiothoracic and neurologic surgery.
Disclosure of interest: No

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Scientific Communication SC7 - Risk Factors, Primary Prevention

ISCHAEMIC BRAIN LESIONS AFTER CAROTID ENDARTERECTOMY OR STENTING FOR ASYMPTOMATIC CAROTID STENOSIS: THE MRI SUBSTUDY OF THE SECOND ASYMPTOMATIC CAROTID SURGERY TRIAL (ACST-2)

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Background and aims: The benefit of revascularisation of asymptomatic carotid stenosis for prevention of stroke depends on a very low peri-procedural risk. Ischaemic brain lesions on diffusion-weighted imaging (DWI) after carotid endarterectomy (CEA) or stenting (CAS) may occur without overt symptoms of stroke.
We aimed to compare the rate of new brain lesions on DWI-MRI in a substudy of the Second Asymptomatic Carotid Surgery Trial (ACST-2), a randomised controlled trial comparing CEA versus CAS in patients with asymptomatic carotid stenosis.
Methods: Patients in ACST-2 at 6 participating centres were investigated with brain MRI 1-7 days before and 1-3 days after the randomly allocated procedure. The primary outcome was the presence of at least one new brain lesion on post-procedure DWI.
Results: 127 patients (58 CEA vs. 69 CAS) were included. 12 patients (21%) in the CEA and 40 patients (58%) in the CAS group had at least one new post-procedural DWI lesion. The number of new DWI lesions per patient was higher in the CAS group (median:2 [IQR:1-4]) than in the CEA group (median:2 [IQR:1-3.5). 1 patient in each group had a stroke (CEA 1.7% vs. CAS 1.4%).
Conclusions: Our study is the first report of ischaemic brain lesions detected by MRI in patients randomly assigned to CAS vs. CEA for asymptomatic carotid stenosis. Despite the low risk of overt periprocedural stroke, our results show a 2.5-fold risk of ischaemic brain lesions in the CAS compared to the CEA group.
Disclosure of interest: No

O034/1992

Scientific Communication SC7 - Risk Factors, Primary Prevention

MACHINE LEARNING-BASED PREDICTIVE MODELING OF ACUTE STROKE OCCURRENCE USING WEATHER SYSTEMS TO IMPROVE CLINICAL RESOURCE ALLOCATION

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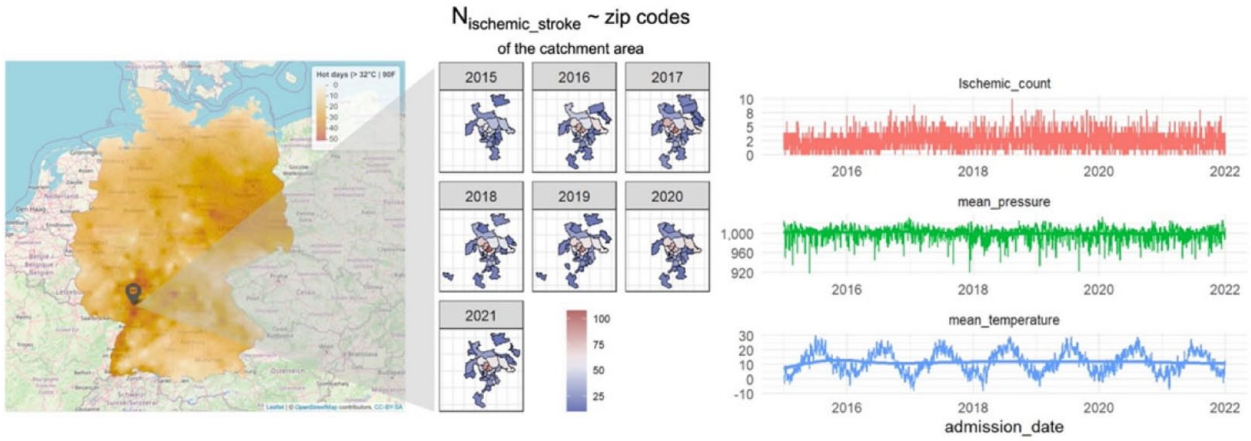
Background and aims: Because of global warming, weather fluctuations are becoming increasingly relevant stressors for the human body leading to cardiovascular stress and potentially to acute cerebrovascular insults. Therefore, we investigated whether machine learning-based models can be utilized to predict the number of daily stroke admissions based on weather parameters.
Methods: 7914 (male:4244,53.6%) patients diagnosed with stroke (2015/01/01-2021/12/31) were extracted from local data integration center of UMC-Mannheim. Weather parameters including complex atmospheric fronts and human meteorological measures were acquired from the German Weather Service. Patient-level clinical and geospatial weather data were matched based on patient location and time of admission to the hospital. Autoregressive neural network (ANN), tree-based models (RF,XGB) and generalized additive models were fitted using time-stratified cross-validation settings to predict total number of ischemic stroke admissions per day as regressors or classificators.
Results: ANNs achieved a mean absolute error of 0.728 (being off <1 patient,Fig1). Mean air temperature was significantly negatively associated with the number of stroke cases resulting in 2.7% increased risk of stroke admission for each 1°C decrease in ambient temperature per day. This effect stayed significant to up to 5 days. The accuracy of the XGB classification model on test data was 61.5%. GAM models identified max. pressure, temperature on previous day, avg. humidity- and ischemic count on prior week and workdays as most important variables.
Conclusions: We found highly significant associations between weather systems and number of stroke admissions, which can be exploited for real-time resource allocation and optimized therapy planning of neuro/radiological emergencies.



Disclosure of interest: No

O035/1042

Scientific Communication SC7 - Risk Factors, Primary Prevention

HOURLY EFFECT OF AMBIENT AIR POLLUTION ON THE ONSET OF ACUTE ISCHEMIC STROKE: INSIGHT FROM THE SHANGHAI STROKE SERVICE SYSTEM DATABASE

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Background and aims: Epidemiological evidence has associated ambient air pollution with the risk of acute ischemic stroke (AIS). However, heterogeneity within these studies resulted from indefinite diagnosis and time of onset led to difficulties in reaching generic conclusions. Combining 5-year air pollution data and a stroke-specific registry, the short-term effect of air pollution on AIS onset at the hourly level was investigated systematically for the first time.

Methods: A time-stratified case-crossover study among 106,623 AIS patients in the Shanghai Stroke Service System (4S) database during 2017-2021 was conducted. Hourly concentrations of $PM_{2.5}$, PM_{10}, O_3, NO_2, SO_2, CO and nitrous acid (HONO) as well as meteorological factors from state-controlled monitoring sites were collected. Conditional logistic regression models were performed to evaluate exposure-response and lag-response relationships.

Results: Acute exposure to $PM_{2.5}$, PM_{10}, SO_2, NO_2 and HONO was found to be associated with AIS onset, respectively. These associations were strongest in the concurrent hour of exposure and attenuated thereafter with the longest lag-effect of 13 hours, as observed for NO_2. Cumulatively, an interquartile range increase in the concentration of $PM_{2.5}$, PM_{10}, SO_2, NO_2 and HONO was significantly associated with 0.8%, 1%, 2.4%, 2.1% and 1.8% higher risks of AIS onset. The association of SO_2 and NO_2 with AIS remained robust in the two-pollutant model.

Conclusions: Transient exposure to particulate matter, SO_2, and reactive nitrogen species (NO_2 and HONO) may trigger AIS onset, which could have a lagged effect up to 13 hours after exposure.

Figure 1. Lag Structures for the Association of Houly-measured Ambient Air Pollutants with AIS Onset

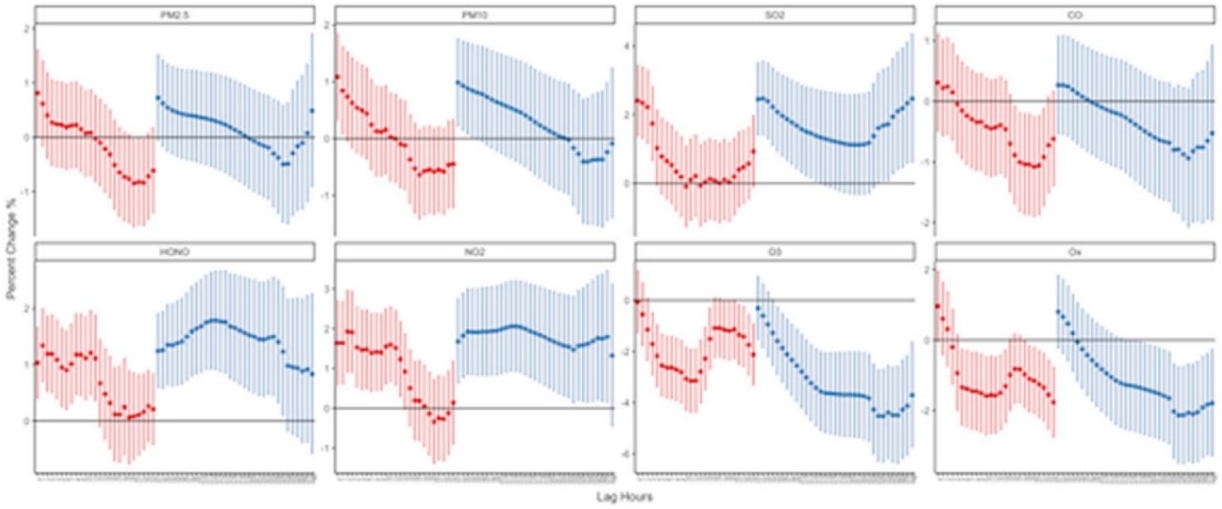
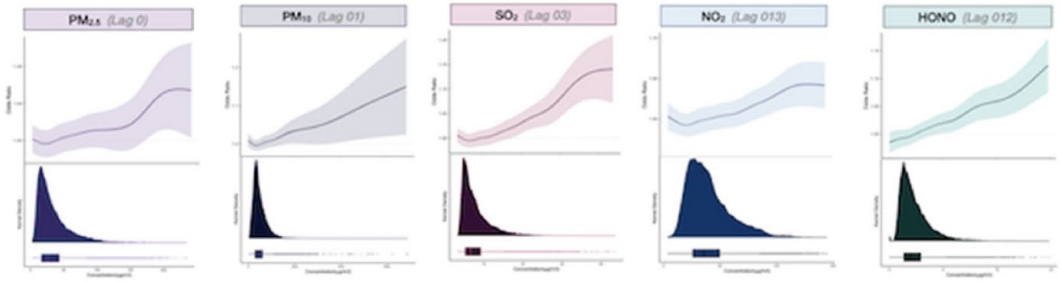


Figure 2. Cumulative Exposure-Response Curves for the Association of Ambient Air Pollutants with AIS Onset



Disclosure of interest: No

O036/808

Scientific Communication SC7 - Risk Factors, Primary Prevention

ASSOCIATION BETWEEN COFFEE CONSUMPTION AND BRAIN MRI PARAMETERS IN THE HAMBURG CITY HEALTH STUDY

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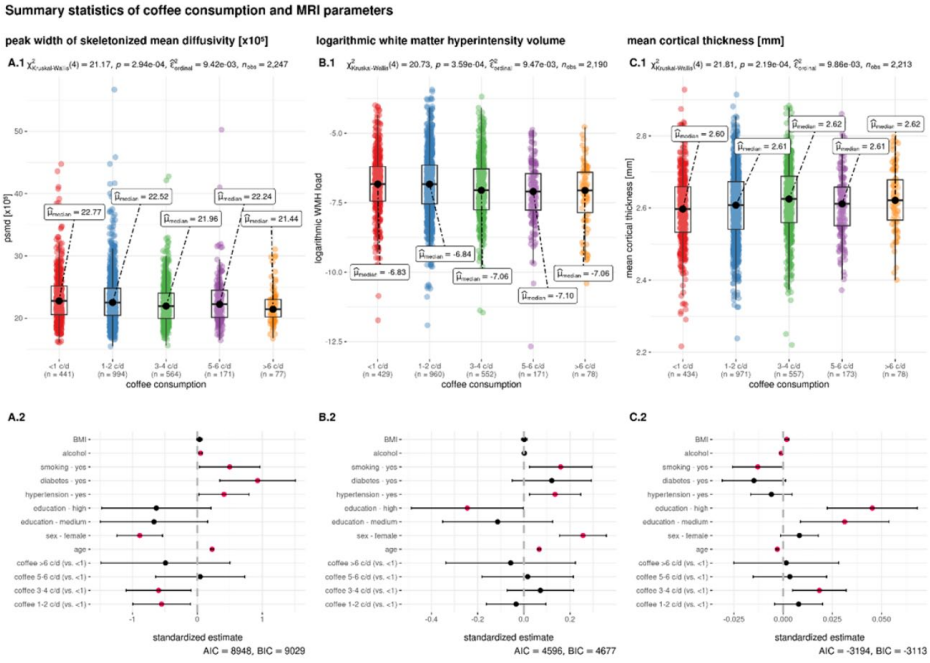
Background and aims: Despite the protective effects of coffee against neurodegenerative disorders such as dementia and cognitive decline, its association with microstructural brain alterations is unclear. To address this, we examined the association of coffee consumption with brain MRI parameters for vascular brain damage, neurodegeneration, and microstructural integrity in 2,316 participants of the population-based Hamburg City Health Study (HCHS).

Methods: Cortical thickness and white matter hyperintensity (WMH) load were measured on FLAIR and T1-weighted images. Microstructural white matter integrity was quantified as peak width of skeletonized mean diffusivity (PSMD) on diffusion-weighted MRI. Daily coffee consumption was assessed in five groups (<1 cup, 1-2 cups, 3-4 cups, 5-6 cups, >6 cups). In multiple linear regressions, we examined the association between brain MRI parameters and coffee consumption (reference group <1 cup).

Results: The sample was characterized by a median age of 65 years and 44.3% female participants. Subjects consuming more coffee were more often younger and male participants, of higher education, with a higher BMI, smokers and not diabetic. After adjustment for covariates, 3-4 cups of daily coffee were associated with lower PSMD (p=0.019) and higher cortical thickness (p=0.008) compared to <1 cup (Fig.1). Moreover, 1-2 cups per day was also associated with lower PSMD (p=0.015). Associations with WMH load or other groups of coffee consumption were not significant (p>0.05).

Conclusions: The findings indicate that regular coffee consumption is positively associated with microstructural white matter integrity and cortical thickness. Further research is necessary to determine longitudinal effects of coffee on brain microstructure.



Disclosure of interest: No

O037/2498

Scientific Communication SC7 - Risk Factors, Primary Prevention

SGLT2 INHIBITION AND RISK OF STROKE: A MENDELIAN RANDOMIZATION STUDY

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Background and aims: A clear protective benefit of sodium glucose cotransporter 2 inhibitors (SGLT2i) on cardiovascular events and kidney disease progression has now been established in several large trials. However, the effect of SGLT2i on the risk of stroke and its subtypes remains unclear.
Methods: A 2-sample mendelian randomization (MR) study design was applied to examine the association between genetic variation in SGLT2 inhibition and stroke risk. Genetic proxies for SGLT2 inhibition were identified as variants in the SLC5A2 gene that were associated with both levels of gene expression and hemoglobin A1c (using data from Genotype-Tissue Expression [GTEx], eQTLGen Consortium, and UK Biobank). Genetic summary statistics for all stroke (AS), ischaemic stroke (IS), large artery stroke (LAS), small vessel stroke (SVS), and cardioembolic stroke (CES)) were retrieved from cross-ancestry GWAS meta-analyses of 110,182 stroke patients and 1,503,898 control individuals (GIGASTROKE).
Results: Genetic variation in SGLT2 inhibition was associated with a trend towards a reduction in the risk of AS (OR= 0.801, 95% CI: 0.541-1.86; p=0.268), IS (OR=0.752, 0.483-1.172; p=0.209), LAS (OR=0.690, 0.172-2.759; p=0.600), SVS (OR=0.580, 0.199-1.690; p=0.318), CES (OR=0.315, 0.098-1.012; p=0.051), and ICH (OR=0.146, 0.003-8.466; p=0.353) but these associations were not statistically significant. Findings were similar across a number of sensitivity analyses.
Conclusions: Consistent with earlier meta-analysis results, we found no clear effect of SGLT2 inhibition on the risk of stroke and its subtypes but stronger genetic associations with ICH and CES that warrant further study.
Disclosure of interest: No

O038/1843

Scientific Communication SC7 - Risk Factors, Primary Prevention

THE PREDICTION MODEL FOR PERIOPERATIVE STROKE IN NON-CARDIAC SURGERY

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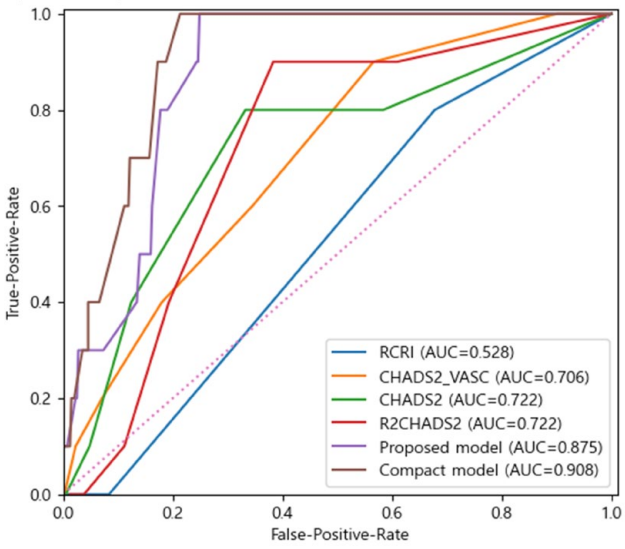
Background and aims: Perioperative stroke affects postoperative morbidity and mortality. Although it is important to stratify high-risk patients before surgery, few studies reported the risk stratification system for perioperative stroke. Risk scores for cardiac complications were used with limited use in clinical practice due to poor predictive performance or inconvenience. We aimed to develop a more accurate and convenient prediction model specific for perioperative stroke using machine learning (ML).
Methods: 36,512 patients from Seoul National University Hospital (SNUH) and 404 patients from Boramae Medical Center (BMC) who underwent non-cardiac surgery were included. Data from SNUH were used to create the development and internal validation dataset. Data from BMC were for the geo-temporal external validation dataset. We defined perioperative stroke as a brain infarction of ischemic etiology within 30 days after surgery. We developed a total of nine ML based prediction model composed of preoperative features and compared it with the conventional scores. We also developed a compact model by utilizing the top 10 key factors of the best-performing model.
Results: Perioperative stroke was developed in 131 (0.31%) patients in the SNUH and 10 (2.45%) patients in the BMC. The CatBoost based prediction model showed the best discriminatory power for high-risk patients, and outperformed the conventional scores in the external validation set as shown in the figure. The compact model was not inferior to the best performing model using all features.
Conclusions: We demonstrated that the ML-based predictive model improved the accuracy and convenience of perioperative stroke prediction.



Disclosure of interest: No

O039/1264

Scientific Communication SC7 - Risk Factors, Primary Prevention

RISK OF STROKE IN PATIENTS WITH PRIOR VKA OR DOAC TREATMENT– A POPULATION-BASED REAL-WORLD ANALYSIS

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Background and aims: To date, risk assessment of suffering ischaemic and haemorrhagic stroke in individuals under oral anticoagulation (OAC) treatment are limited to hospital-based cohorts and those with atrial fibrillation.
Methods: Through (1) the population-based Tyrolean Stroke Pathway database, prospectively documenting standardized patient care in the entire federal state of the Tyrol and (2) nation-wide prescription data, detailing each reimbursed prescription in Austria, we assessed risk of ischaemic or haemorrhagic stroke in patients with prior OAC irrespective of its indication.
Results: In Austria, a continuous increase of OAC prescription reimbursements from 292,475 in 2015 to 389,407 in 2021 was observed, mainly driven by prescriptions of direct oral anticoagulants (DOAC). In the population of Tyrol, prior OAC treatment was evident in 586 of 3,861 (15.2%) of ischaemic and 131 of 523 (25.0%) of haemorrhagic stroke patients. Taking federal prescription rates into account, 3-year ischaemic stroke risk was higher in those with prior VKA compared to prior DOAC treatment (1.05%vs.0.62%; OR 0.59 [CI 0.49-0.71] P<0.001). Concerning hemorrhagic stroke, risk difference between Vitamin-K-Antagonists (VKA) or DOAC was not as pronounced (0.21%vs.0.14%; OR 0.68 [CI 0.45-1.02] P=0.06).
Conclusions: In our population-based setting, one in seven patients suffering ischemic and one in four suffering haemorrhagic stroke had prior OAC treatment. In the real world setting, both ischaemic and haemorrhagic stroke is less frequent in DOAC- than VKA-treated patients. Establishment of clear SOPs on how to best care for acute stroke patients on OAC is essential.
Disclosure of interest: No

O040/722

Scientific Communication SC8 - Cognition and Vascular Cognitive Impairment

INCIDENCE AND PROGNOSTIC INDICATORS OF DEMENTIA IN PATIENTS WITH TIA AND STROKE: THE POPULATION-BASED ROTTERDAM STUDY

Jacqueline Claus*[1,2,3], Box Camiel[1,2,3], Vinke Elizabeth[3], Mathijs Rosbergen[1,2,3], Meike Vernooij[3], Mohammad Kamran Ikram[1,2], Arfan Ikram[1], Frank Wolters[1,3]
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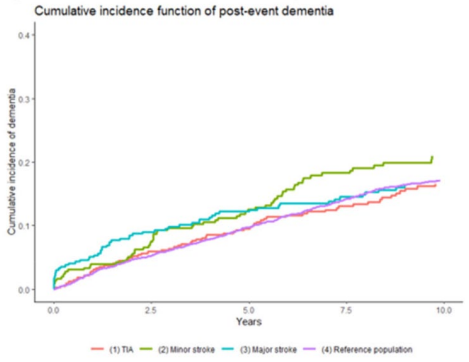
Background and aims: Risk of dementia is high after major stroke, but estimates of dementia by stroke severity, accounting for competing risk of mortality, in a population-based setting are scarce. We aimed to determine risk and prognostic indicators of dementia after TIA and stroke.
Methods: We included all individuals with first-ever TIA or stroke from the population-based Rotterdam Study, between 2002-2018, and matched those 1:3 to reference participants on age (+/-3 years) and sex, using an incidence-density-sampling approach. We determined risk of dementia post-event using the subdistribution hazards (SDH) cumulative incidence function (CIF), and explored prognostic indicators.
Results: Among 1352 participants (mean age: 78.4 (9.4) years, 57.6% women), 427 had TIA, 357 minor stroke and 395 major stroke. Compared to TIA, dementia risk was higher after major stroke (HR 2.17; 95% CI 1.53–3.07) and minor stroke (HR 1.63; 95% CI 1.17–2.26). Dementia risk was associated with male sex (SDH-ratio 1.23; 95% CI 1.04–1.45), age (per 1-year increase: 1.07; 1.06–1.08), higher education (0.61; 0.44–0.86), diabetes mellitus (1.29; 1.06–1.56), atrial fibrillation (1.40; 1.14–.71), and premorbid cognition (MMSE≤24, 2.39; 1.87–3.05), white matter hyperintensities (per 1-% increase of total-brain-volume: 1.24; 95% CI 1.07–1.45) and presence of microbleeds (2.14; 1.18–3.86).
Conclusions: Dementia incidence after TIA and stroke is increased in patients with major stroke and to a lesser extent minor stroke, but not TIA. Event severity in combination with clinical and imaging indicators may hold potential for prediction of cognitive decline after stroke.

Figure 1. Cumulative incidence function of post-event dementia for 10 years of follow-up



	Cumulative incidence function		
	1 year	5 years	10 years
Reference population	2.5	9.3	14.6
TIA	2.8	9.4	14.8
Minor stroke	3.9	11.8	17.9
Major stroke	5.1	11.6	14.7

Disclosure of interest: No

O041/2119

Scientific Communication SC8 - Cognition and Vascular Cognitive Impairment

WHITE MATTER HYPERINTENSITY VOLUME AND POST-STROKE COGNITIVE FUNCTIONING: A POOLED ANALYSIS OF INDIVIDUAL PATIENT DATA FROM NINE ISCHEMIC STROKE COHORT STUDIES

Floor de Kort*[1], Geert Jan Biessels[1]
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Background and aims: White matter hyperintensities (WMH) are associated with cognitive functioning after ischemic stroke. Yet, uncertainty remains about affected domains and the role of both previous infarcts and stroke-subtypes. We aimed to disentangle these factors in a large multi-center cohort of patients with ischemic stroke.
Methods: From nine cohorts we harmonized individual data from 1568 ischemic stroke patients (67 years (SD 11,5), 40% female) with available MRI and multi-domain cognitive assessment <15 months post-stroke through the MetaVCIMap consortium (www.metavcimap.org). Mixed linear models were used to assess the independent relation between total WMH volume (processed centrally; median volume 7 mL (IQR 3-19)) and domain-specific functioning (harmonized mean Z-scores; Attention & Executive functioning, Processing Speed, Language, Verbal Memory) for the total sample and stratified by stroke-subtype.

Results: In the total sample, WMH volume was significantly related to performance on all four domains (Figure). This relation was largely independent of acute infarct volume and presence of previous infarcts/lacunes. In stratified analysis, the independent relation between WMH volume and domain-specific performance was also observed for subgroups with large supratentorial and small subcortical infarcts, but not for infratentorial infarcts (Figure).

Conclusions: These results show that both in patients with large supratentorial infarcts and small subcortical infarcts WMH volume is an independent determinant of cognitive functioning on all key cognitive domains, regardless of prior ischemic lesions.

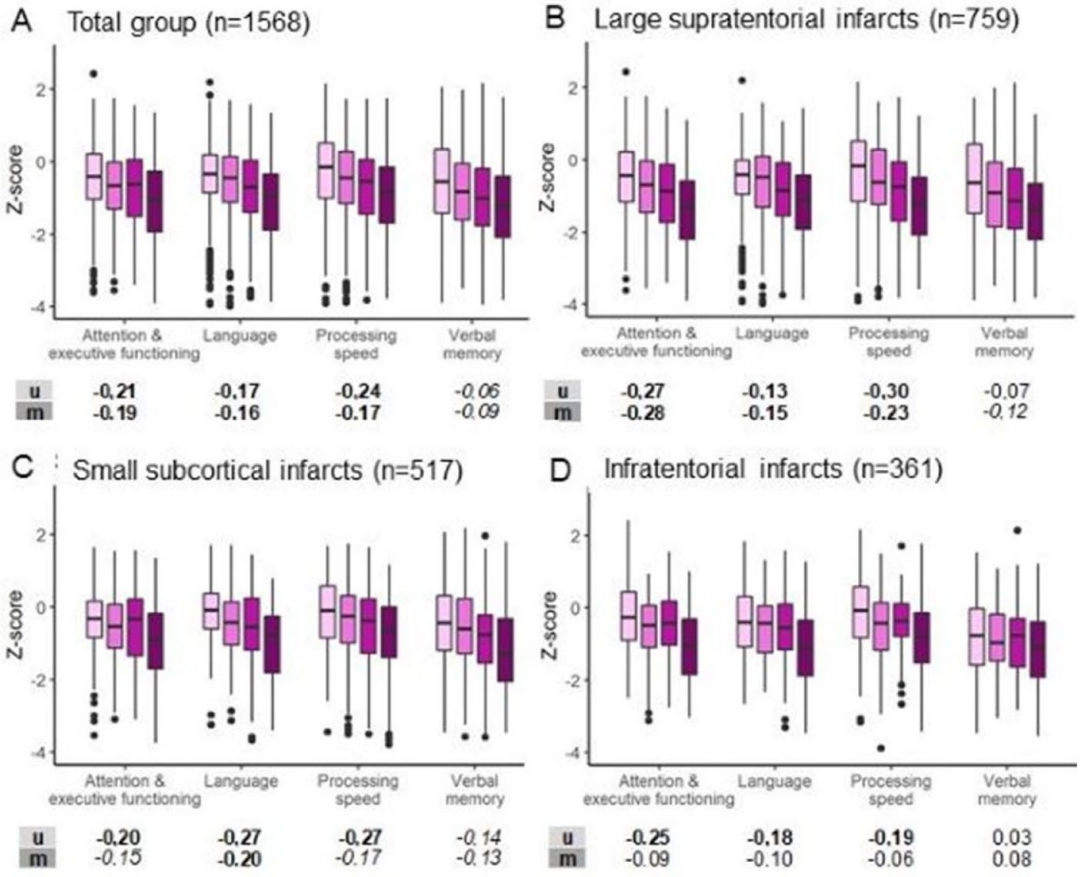

Figure. White matter hyperintensity volume versus domain-specific cognitive performance. *Panel A* Total sample, *Panel B,C,D* Stratification by stroke-subtype; participants could be attributed to more than one subgroup. *Upper part of panels* WMH volume (quartiles) versus domain-specific cognitive performance (Z-scores). *Lower part of panels* Domain-specific coefficients for WMH volume in mixed linear models. Univariate: WMH volume (fixed effect) and cohort (random effect). Multivariate: as univariate + age, sex, education, ethnicity, acute infarct volume, presence of lacunes and old infarcts (fixed effects). Coefficients with p<0.005 are shown in **bold**, p<0.05 *italic*.

Disclosure of interest: No

O042/1263

Scientific Communication SC8 - Cognition and Vascular Cognitive Impairment

CONTRIBUTIONS OF BRAIN AREAS TO POST-STROKE COGNITIVE IMPAIRMENT INFERRED BY GAME-THEORETICAL LESION ANALYSIS – A SUBSTUDY IN THE METAVCIMAP CONSORTIUM

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Background and aims: The underlying structural determinants of post-stroke cognitive impairment (PSCI), comprising a network of strategic brain areas, require further investigation. We apply a multivariate approach based on game theory (Multiperturbation Shapley value Analysis, MSA) to infer causal contributions of white and grey matter regions to PCSI in a large-scale, multi-cohort study on PSCI with increased anatomical lesion coverage.
Methods: Lesion patterns of N=2114 acute ischemic stroke patients from 9 cohorts were analysed. Lesion-deficit inferences were conducted based on normalized test scores from 5 cognitive domains (evaluated up to 15 months after stroke onset) and 295 pre-defined grey and white matter brain regions. Impairment was defined as performance lower than the fifth percentile in each domain score. We employed an iterative method coupling estimated MSA and bootstrap validations to obtain functional contributions and synergistic interactions of brain regions to PSCI and cognitive impairment in individual domains.
Results: We detect significant differential contributions of brain regions related to PSCI from both hemispheres, specifically the anterior-medial thalamus, precuneus, orbitofrontal gyrus and transcallosal fiber tracts. Impairment of language function and verbal memory were linked to left-hemispheric brain areas, whereas a non-lateralized pattern contributed to impairment in other cognitive domains. Explorative analysis indicated synergistic negative effects of subcortical and cortical brain areas on PSCI.
Conclusions: We link PSCI to a strategic, cortico-subcortical network of brain areas and white matter fiber tracts involved in cognitive functions using MSA as an innovative approach for lesion-symptom inference.
Disclosure of interest: No

O043/1802

Scientific Communication SC8 - Cognition and Vascular Cognitive Impairment

ASSOCIATIONS OF DIFFERENT BLOOD PRESSURE (BP) PARAMETERS WITH COGNITIVE DECLINE AND DEMENTIA IN PATIENTS WITH MILD COGNITIVE IMPAIRMENT (MCI) AND DIABETES

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Background and aims: Recent evidence indicates that BP variability and cumulative BP load are independently associated with the risk of cardiovascular diseases and subclinical target organ damage, over and beyond standard measures like mean systolic BP (SBP). This study aimed to investigate if different BP parameters are associated with cognitive decline and dementia in patients with MCI and type 2 diabetes in the Action in Diabetes and Vascular Disease: Preterax and Diamicron Modified Release Controlled Evaluation (ADVANCE) trial.
Methods: Logistic regression was used to estimate the odds ratio per standard deviation higher and 95% confidence intervals (CI) for cognitive decline/dementia using baseline SBP and diastolic BP (DBP), mean SBP and DBP, SBP and DBP variability and cumulative SBP and DBP load, calculated from an 18-month exposure window which comprised of 5 BP measurements at 3, 4, 6, 12 and 18 months. The results were adjusted for age, sex, education level and geographic location.
Results: Of the 11,140 ADVANCE participants, 9,586 patients had 5 complete BP measurements and 2,080 of these patients had MCI at baseline. After 5 years of follow-up, 1,674 patients were diagnosed with cognitive decline and/or dementia. Baseline SBP and SBP and DBP variability, but not BP load, were associated with cognitive decline/dementia (OR: 1.06 (95% CI 1.00-1.11); 1.11(1.06-1.17); and 1.10 (1.04-1.15), respectively).
Conclusions: Higher SBP and DBP variability and not mean SBP or BP load were associated with cognitive decline/dementia, which suggests that BP variability could be an important therapeutic target for future studies.
Disclosure of interest: No

O044/1164

Scientific Communication SC8 - Cognition and Vascular Cognitive Impairment

SUBCLINICAL INFARCTS AND INTENSIVE SYSTOLIC BLOOD PRESSURE TREATMENT: A SECONDARY ANALYSIS OF SPRINT-MIND

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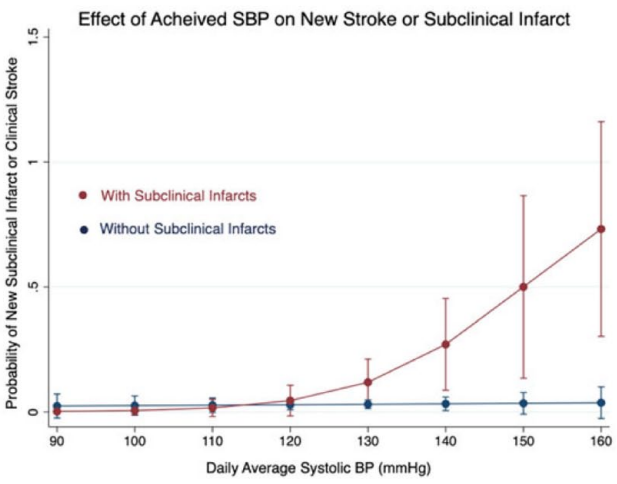
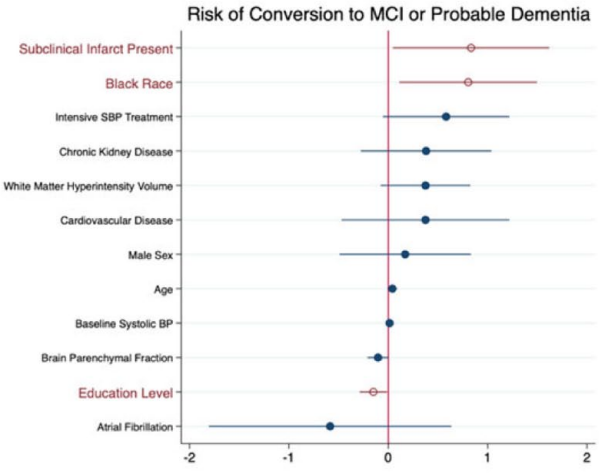
Background and aims: Subclinical brain infarcts (SBI) increase the risk for stroke and dementia, but it is unclear whether they should be considered equivalent to symptomatic stroke when determining blood pressure targets. We tested whether intensive systolic blood pressure (SBP) treatment reduced the risk of new SBI or clinical stroke.
Methods: In this secondary analysis of SPRINT-MIND, participants $\geqslant$50 years old, with SBP 130-180, but without clinical stroke or dementia were randomized to intensive ($<$120 mmHg) or standard ($<$140 mmHg) SBP treatment and underwent brain MRI at baseline and 4 years. Blinded MRIs were read for SBI by 2 readers. Conversion to mild cognitive impairment (MCI) or probable dementia (PD) was adjudicated.
Results: For 667 participants at baseline, SBI were identified in 74(11%). 457 had MRI follow-up at median 3.9 years. Eight had interval clinical stroke (4 per group) while 12 had new SBI (4 intensive; 8 standard treatment). New clinical stroke or interval SBI was associated with baseline SBI (OR:13.15 [3.46-49.94]), but not with treatment group. However, for those with baseline SBI, intensive SBP treatment reduced the risk for recurrent SBI or clinical stroke (OR:0.048 [0.004-0.632]). Baseline SBI also increased the risk of conversion to MCI or PD (n=612, OR:2.3 [1.05-5.05]) while covarying for white matter hyperintensities and brain atrophy.
Conclusions: SBI are associated with new cerebral ischemic events and poor cognitive outcomes, regardless of SBP treatment group. But when





SBI are present, intensive SBP treatment appears safe and reduces the risk for new cerebral ischemic events.
Disclosure of interest: No

O045/485

Scientific Communication SC8 - Cognition and Vascular Cognitive Impairment

MICRO-STROKES AFFECT DEGENERATION OF MEMORY CIRCUITS IN THE HIPPOCAMPUS

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Background and aims: Cerebral small vessel disease (SVD) is a major cause of cognitive impairment in older adults. However, the neuropathology between dysfunction of the brain`s arterioles, capillaries and venules and neuronal network activity- in particular in areas not directly affected by micro-lesions- are not well understood, nor does there currently exist any specific therapy preventing cognitive decline from SVD.
Methods: We here present a mouse model where we study memory circuits in the hippocampus – an area critically involved in memory formation and degeneration- in the healthy condition and after induction of cerebral micro-strokes. Mice are trained to navigate in a virtual corridor while we performed chronic 2photon calcium imaging in the same field over view during learning and after stroke. After brain-wide micro-infarcts, we observe responses to the injury on a cellular and network level.
Results: We show that globally distributed cerebral micro-strokes induce cognitive decline, while sparing motor function. Micro-strokes substantially influence functional recoding and rewiring of surviving neurons to restore lost memory engrams. The stability of coding of surviving place cells with important spatial information increases after micro-strokes, serving as anchor cells for other surviving cells to participate in repair processes. Cognitive decline can be prevented by distinct auditory-visual stimulation (40Hz) after micro-stroke induction.
Conclusions: Our approach reveals how even remote hippocampal networks are affected by globally induced cerebral micro-strokes causing cognitive decline. However, stimulating hippocampal networks early after micro-strokes enhances rewiring capacities and opens up new options for novel therapeutic strategies for vascular dementia.
Disclosure of interest: No

O046/2153

Scientific Communication SC8 - Cognition and Vascular Cognitive Impairment

STROKE RECOVERY GENOME-WIDE ASSOCIATIONS ARE DEPENDENT ON PHENOTYPE DEFINITION

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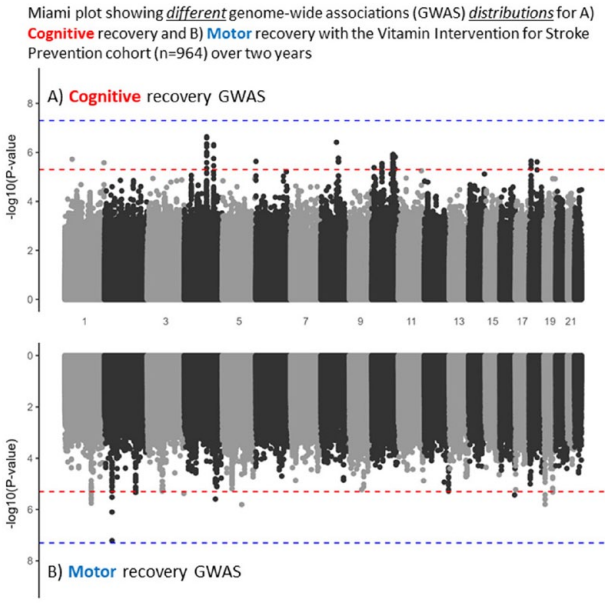
Background and aims: There are no stroke recovery studies investigating the impact of phenotype selection on genetic associations. We examined the impact of phenotype definition on genetic associations by performing GWAS for three stroke recovery phenotypes: cognition, motor and overall stroke impairment.
Methods: We utilized the Vitamin Intervention for Stroke Prevention trial cohort (n=2100) to perform three GWAS with cognition, motor, and global impairment defined as the change in Cog-4, Motor-6, and Overall scores from the NIH Stroke Scale sub-items. After quality control procedures and imputation via TOPMed (n= 6,392,745), we used a linear mixed effect model with the response variable as the change in the phenotype scores with fixed effect covariates: initial score, age, sex, trial group, race, PC1 to PC5, stroke onset to follow-up. Patient ID was the random effect, accounting for repeated measurements. We added race as a covariate because it predicted missing NIHSS scores.
Results: The cognition phenotype (n=964) had 90 suggestive SNP associations (pvalue$<$5e-6) containing 9 genes. Motor behavior (n=964) had 30 suggestive SNP associations containing 8 genes. Global stroke impairment (n=1,900) had 53 suggestive and 2 genome-wide significant

(pvalue<5e-8) SNP associations containing 11 genes. The phenotypes did not shared a SNP or gene. However, there was overlap in the protein tyrosine phosphatase gene family between cognition (*PTPRM*) and motor (*PTPRS*); linked to adult neural repair.

Conclusions: Genetic variations and their genes showed no overlap among the stroke recovery phenotypes. This suggests that stroke recovery GWASs are sensitive to how recovery is defined.



Disclosure of interest: No

O047/2177

Scientific Communication SC8 - Cognition and Vascular Cognitive Impairment

FUNCTIONAL BRAIN CONNECTIVITY IN YOUNG ADULTS WITH POST-STROKE EPILEPSY

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[1]*Radboud University Medical Centre; Donders Center for Medical Neuroscience, Department of Neurology, nijmegen, Netherlands*, [2]*Luzerner Kantonsspital Neurocentre, Department of Neurology and Neurorehabilitation, Luzern, Switzerland*, [3]*Deventer Hospital, Department of Medical Psychology, Deventer, Netherlands*, [4]*Medisch Spectrum Twente, Department of Neurology, Enschede, Netherlands*, [5]*F. Hoffmann – La Roche Ltd, F. Hoffmann – La Roche Ltd, Basel, Switzerland*, [6]*Radboud University; Donders Institute for Brain, Cognition and Behavior, Department of Psychology, Nijmegen, Netherlands*, [7]*Radboud University Medical Centre; Donders Center for Medical Neuroscience, Department of Neurology, Nijmegen, Netherlands*

Background and aims: About 10% of young stroke patients develop post-stroke epilepsy (PSE), which is associated with cognitive impairment. Little is known about the functional networks in young stroke patients with PSE and its relationship with cognitive impairment.

Methods: 164 patients with first-ever ischemic stroke (18-50 years) and 77 age- and sex-matched controls from the FUTURE study were included. All participants underwent neuropsychological testing and resting-state functional MRI to generate functional connectivity networks, followed by graph-theoretical analyses.

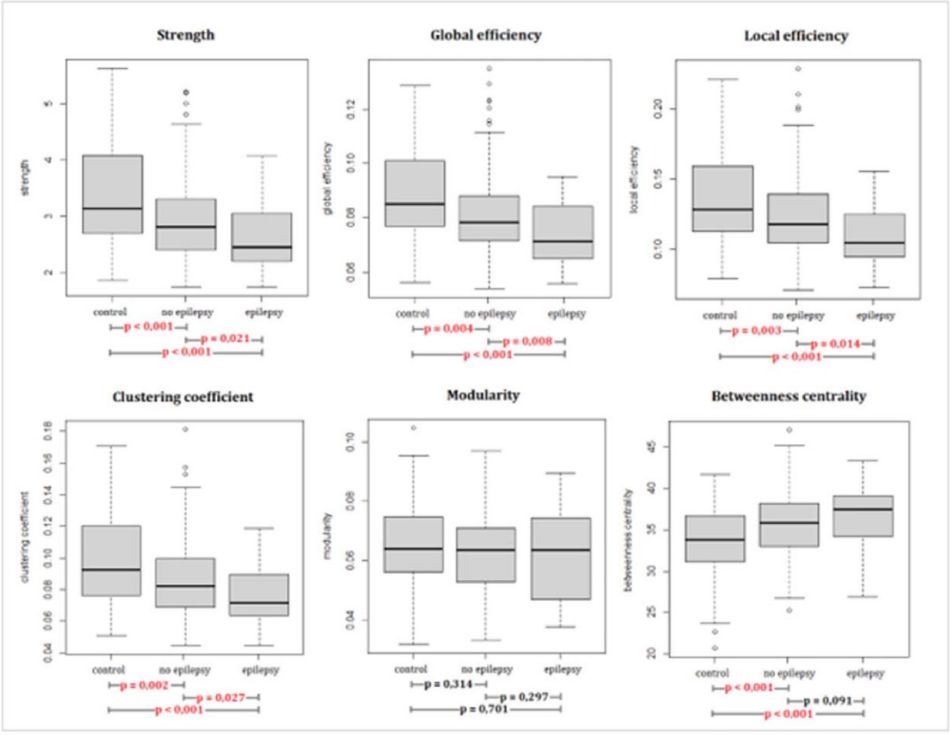

Figure 1: Boxplots of the functional network properties, divided by group. Corresponding p-values computed with ANCOVA testing, adjusted for age and sex, are added below (significant p-values are shown in red and non-significant p-values in black).

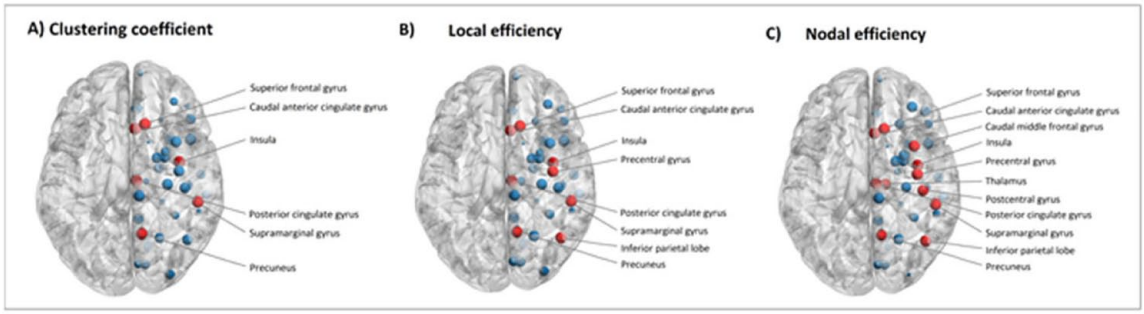

Figure 2: Brain regions (in red) of the contralateral (e.g. 'healthy') hemisphere, showing lower clustering coefficient (A), local efficiency (B) and nodal efficiency (C) in participants with post-stroke epilepsy (PSE) compared to participants without PSE (p-uncorrected<0.05). After FDR-correction for multiple comparisons, none of the brain regions remained significant.

Results: 23 of 164 participants developed PSE (mean age 50.2 at follow-up, 58% male). Graph theoretical analysis revealed (figure 1) a weaker (i.e. network strength), less integrated (i.e. global efficiency) and less segregated (i.e. clustering coefficient and local efficiency) functional network (participants with PSE vs. without PSE, $p<0.05$). Regional analysis (figure 2) showed a trend towards decreased clustering coefficient, local efficiency, and nodal efficiency in contralesional brain regions in participants with PSE compared to those without PSE. Furthermore, participants with PSE more often had impairment in processing speed domain than the group without PSE, in whom the network properties of precuneus were positively associated with processing speed performance.
Conclusions: PSE is associated with functional reorganization of the brain network after stroke that is characterized by a weaker, less integrated, and less segregated brain network in young stroke patients compared to patients without PSE. The contralesional brain regions might be particularly involved in the altered functional network and may contribute to cognitive impairment in PSE participants.
Disclosure of interest: No

O048/110

Scientific Communication SC9 - Diagnosis / Investigation of Stroke Etiology and Pathophysiology

LONG TERM OUTCOME OF ACUTE STROKE PATIENTS UNDERGOING CARDIAC CT AS PART OF THE INITIAL STROKE IMAGING PROTOCOL

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Background and aims: Cardiac CT acquired during the initial acute stroke imaging protocol (acute cardiac CT) is increasingly used to screen for cardioembolism, but there is no information on the long-term clinical implications of its findings.
Methods: We performed a prospective, single-center, observational cohort study in which consecutive patients with ischemic stroke underwent acute cardiac CT and were followed up for 2 years. Outcomes were the modified Rankin Scale (mRS) at 2-years and occurrence of major adverse cardiovascular events (MACE, defined as composite of ischemic stroke recurrence, myocardial infarction or cardiovascular death) during follow-up. We used regression analyses to assess the association between high-risk sources of embolism detected on cardiac CT and outcomes.
Results: Of 452 included patients (59% male, median age 72), 55 (12%) had a high-risk source of embolism on cardiac CT, predominantly cardiac thrombi (38 patients) and signs of endocarditis (8 patients). Follow-up was available for 430 (95%) patients. A high-risk source of embolism was associated with worse functional outcome (median mRS 6 [IQR 2–6] vs 2 [IQR 1–5], adjusted common odds ratio: 2.84, 95%CI: 1.58–5.10), increased mortality (53% vs 24%, adjusted hazard ratio[aHR]: 3.10, 95%CI: 1.84–5.21) and occurrence of MACE (39% vs 18%, aHR: 3.20, 95%CI: 1.80–5.69). We did not observe an association with recurrent ischemic stroke (11% vs 10%, aHR: 1.30, 95%CI: 0.49–3.44).
Conclusions: High-risk sources of embolism identified on acute cardiac CT in patients with ischemic stroke are strongly associated with poor functional outcome and MACE.
Disclosure of interest: No

O049/271

Scientific Communication SC9 - Diagnosis / Investigation of Stroke Etiology and Pathophysiology

HEART RATE TURBULENCE IN ACUTE ISCHEMIC STROKE: AN ANALYSIS OF HOLTER ECG DATA FROM THE HEBRAS STUDY

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Background and aims: Cardiac autonomic dysfunction after acute ischemic stroke (AIS) is frequent and associated with poor clinical outcome. Heart Rate Turbulence (HRT) is an ECG-based marker of baroreflex sensitivity, reflecting both, sympathetic and parasympathetic autonomic cardiac regulation. HRT has shown strong prognostic value regarding mortality and cardiac complications in cardiologic patients. We investigated the association of HRT with outcome and cardiac comorbidities in AIS patients.
Methods: HRT-parameters turbulence onset (TO) and turbulence slope (TS) were analyzed using Holter-ECG recordings of patients included in the prospective HEart-and-BRain-interfaces-in-Acute-Stroke (HEBRAS) study (NCT02142413). According to measurement guidelines, three categories of HRT were defined (*0*=both TO and TS normal or ⩽5 premature ventricular complexes, *1*=TO or TS abnormal, 2=TO and TS abnormal). Outcomes of interest were mortality after one year, functional outcome (mRS⩾2) after three months, atrial fibrillation and focal cardiac fibrosis in cardiovascular MRI.
Results: HRT-assessment was feasible in 335/356 patients (94%). Frequency of HRT-categories 0, 1 and 2 were 78.2% (n=262), 14.0% (n=47) and 7.8% (n=26), respectively. In adjusted logistic regression analysis, HRT parameters showed no association with functional outcome or mortality. Compared with category 0, HRT category 2 (highest HRT abnormality) was associated with atrial fibrillation detection after stroke (23.1% vs. 7.5%, adjusted OR=5.01, 95%CI: 1.60-15.66) and with focal cardiac fibrosis (69.2% vs. 25.3%, adjusted OR=6.87, 95%CI: 1.56-30.31).
Conclusions: One in five AIS patients shows pathologic TO or TS. Pathologic HRT might be indicative of unknown cardiac comorbidities and may help selecting stroke patients for prolonged AF monitoring.
Disclosure of interest: No

O050/496

Scientific Communication SC9 - Diagnosis / Investigation of Stroke Etiology and Pathophysiology

CARDIAC FINDINGS FOLLOWING ACUTE ISCHEMIC STROKE ARE DIFFERENT IN MEN AND WOMEN

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Background and aims: In patients without previous heart disease, cardiac pathologies can be associated with acute ischemic stroke (AIS) as heart and brain activities are interconnected. Further, cardiac findings are likely sex-specific. We studied the association of sex with newly diagnosed cardiac pathologies within the 1st year after AIS.
Methods: We screened 7113 patients with a first cerebrovascular event between 12/2013 and 03/2021 at the Neurology Department of the University Hospital Zurich and included 817 (39% women) patients with AIS and no previous cardiac disease. Electronic records were screened for cardiological exams (including consultations, echocardiography, results from coronary-CT, cardiac-MRI, myocardial-perfusion SPECT) within 1 year following the index event.
Results: Women were more likely to develop atrial fibrillation (AF) (OR 2.94; CI 1.78 – 4.09; p= 0.003) and tricuspid insufficiency (OR 2.25; CI 1.23 – 3.27; p = 0.016) than men following AIS. Men suffered more often from non-sustained-ventricular-tachycardia (NSVT) (OR 4.35; CI 2.95 – 5.75; p=0.006), AV-Block I° (OR 3.31; CI 2.08 – 4.54; p = 0.038), supraventricular-extrasystoles (OR 1.41; CI 0.60 – 2.22; p= 0.016), polymorphic-ventricular-extrasystoles (OR 2.26, CI 1.24 – 3.28; p = 0.003), bradycardia (OR 3.18, CI 1.98 – 4.38; p= 0.006) or left-ventricular (LV) wall-motion abnormalities (OR 2.06; CI 1.09 – 3.03; p= 0.037).
Conclusions: Cardiac findings are common after AIS and vary between sexes. AF is more likely to occur in women, while NSVT and LV wall motion abnormalities are more common in men. Considering that, these findings have an important impact on cardiovascular health and mortality, their occurrence warrants clinical appreciation.
Disclosure of interest: No

O051/2195

Scientific Communication SC9 - Diagnosis / Investigation of Stroke Etiology and Pathophysiology

MICROTHROMBI FORMED FOLLOWING ISCHEMIC STROKE OPEN THE BLOOD-BRAIN BARRIER FOR NANOCARRIERS

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Background and aims: New treatments for ischemic stroke are urgently needed. Using nanomedicines to specifically deliver drugs could increase efficacy and reduce toxicity. However, the spatial-temporal characteristics of the distribution of nanocarriers (NC) as well as whether NCs are actually crossing the BBB after stroke are still unknown.
Methods: Fluorescent super-bright lipid nanoemulsions (SBLNE; diameter: 30-nm) were loaded with a counterion-coupled rhodamine dye or with two dyes, F888 and cyanine-3.5, undergoing Förster Resonance Energy Transfer (FRET). Ischemic stroke was induced by filament middle-cerebral artery occlusion (fMCAo) or a newly developed nano-stroke model. SBLNE was injected systemically into mice after stroke and visualized by *in vivo* by 2-photon or confocal microscopy.
Results: NCs accumulated in microvascular thrombi that formed in ischemic brain and extravasated into the brain parenchyma. Using the nano-stroke model and FRET-loaded nanoparticles together with two-photon microscopy we characterized the spatial and temporal profile of this process and observed that microthrombi form in a delayed manner after reperfusion. Further, NCs disintegrate and extravasate at sites of microthrombus formation. Collectively, microthrombi open the blood-brain barrier for NCs allowing intact nanoparticles to reach the brain parenchyma.
Conclusions: Targeting of microthrombi by SBLNE could therefore represent a novel approach to investigate microvascular pathology after cerebral ischemia and to develop novel therapeutics.
Disclosure of interest: No

O052/442

Scientific Communication SC9 - Diagnosis / Investigation of Stroke Etiology and Pathophysiology

THE CONTRIBUTION OF COMPETING MECHANISMS IN STROKE DESPITE ANTICOAGULATION IN PATIENTS WITH ATRIAL FIBRILLATION

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Background and aims: For reasons that are poorly understood, strokes frequently occur in patients with atrial fibrillation (AF) despite oral anticoagulation. Better data are needed to inform randomised trials (RCTs) of strategies to prevent recurrence in these patients. We investigate the relative contribution of competing mechanisms in patients with AF who have stroke despite anticoagulation (OAC+) compared with those who are anticoagulant naïve (OAC-) at the time of their event.

Methods: We performed a cross-sectional study leveraging data from a prospective stroke registry from 2015-2022. Eligible patients had ischemic stroke and AF. Stroke classification was performed by a single stroke-specialist blinded to OAC status using TOAST criteria. The presence of atherosclerotic plaque was determined using duplex ultrasonography, computerized tomography, or magnetic resonance angiography. Imaging was reviewed by a single reader. Logistic regression was used to identify independent predictors of stroke despite anticoagulation.

Results: Of 596 patients included, 198 (33.2%) were in the OAC+ group. A competing cause for stroke was more frequent in patients with OAC+ (48.8% vs. 19.4% OAC-, $p<0.001$). After adjustment, both small artery occlusion (odds ratio [OR] 2.46, 95% CI 1.20-5.06) and arterial atheroma (⩾50% stenosis) (OR 1.78, 95% CI 1.07-2.94) were independently associated with stroke despite anticoagulation.

Conclusions: Patients with AF-associated stroke despite OAC are much more likely than patients who are OAC-naïve to have competing mechanisms. Rigorous investigation for alternative causes in stroke despite OAC has a high diagnostic yield. These data should be used to guide patient selection for future RCTs.

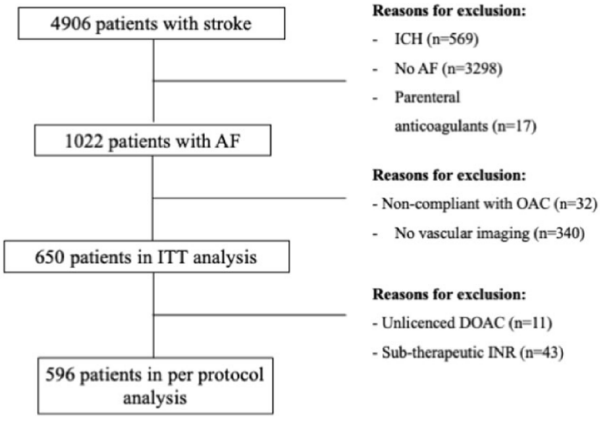

Figure 1: Derivation of final study cohort.

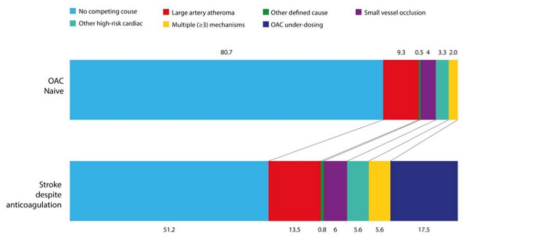

Figure 2: Stroke aetiology stratified by OAC status. Data is derived from the intention-to-treat analysis and presented as percentage of total. Multiple mechanisms refer to patients with ≥2 mechanisms in addition to AF.

Disclosure of interest: No

O053/866

Scientific Communication SC9 - Diagnosis / Investigation of Stroke Etiology and Pathophysiology

RISK OF A CANCER DIAGNOSIS IN PATIENTS WITH CEREBRAL VENOUS THROMBOSIS COMPARED WITH THE DANISH GENERAL POPULATION

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Background and aims: Cerebral venous thrombosis (CVT) is a rare manifestation of stroke. It remains uncertain whether CVT is a marker of occult cancer. We investigated the risk of a cancer diagnosis among patients with CVT compared with the expected cancer risk in the Danish general population.

Methods: We used Danish nationwide registries to construct a cohort of patients with a first-time primary, inpatient diagnosis of CVT (positive predictive value >90%) without a history of cancer (n = 811, 65% women, median age 42 years). We assessed the risk of an incident cancer diagnosis during follow-up using standardized incidence ratios (SIR). This measure contrasts the number of observed cancers among CVT patients to the number of expected cancers should CVT patients have the same cancer risk as the general population.

Results: Observing 42 cancer diagnoses during follow-up, the overall SIR was approximately unity (SIR: 1.04, 95% confidence interval [CI]: 0.75, 1.40). However, the risk was approximately seven-fold the expected level in the first three months (SIR: 7.00, 95% CI: 3.02, 13.80) and approximately two-fold the expected level from three to 12 months (SIR: 2.21, 95% CI: 0.89, 4.56) following diagnosis. After 12 months following diagnosis, the risk reached the expected level (SIR: 0.76, 95% CI: 0.50, 1.09).

Conclusions: CVT was a marker of occult cancer, particularly in the first three months after diagnosis.

Disclosure of interest: No

O054/1484

Scientific Communication SC9 - Diagnosis / Investigation of Stroke Etiology and Pathophysiology

ASSESSING THE SENSITIVITY OF THE BOSTON CRITERIA VERSION 2.0 IN DUTCH-TYPE HEREDITARY CEREBRAL AMYLOID ANGIOPATHY

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Background and aims: The Boston criteria version 2.0 for cerebral amyloid angiopathy (CAA) add presence of at least one white matter feature to current criteria; severe visible perivascular spaces in the centrum semiovale (CSO-EPVS) and white matter hyperintensities (WMH) in a multispot pattern. This study aims to determine the sensitivity of the new Boston criteria in Dutch-type CAA (D-CAA) patients.

Methods: In this cross-sectional study, we included D-CAA mutation carriers at the Leiden University Medical Center between 2018-2021. 3-Tesla scans were assessed for hemorrhagic and white matter MRI markers. Sensitivity of the Boston criteria version 2.0 was compared to the modified Boston criteria.

Results: We included 64 D-CAA mutation carriers (mean age 49 years, 45% with history of symptomatic intracerebral hemorrhage (ICH)). At least one white matter feature was seen in 55/64 patients (86%): 10/64 patients (16%) had only CSO-EPVS, 4/64 patients (6%) had only WMH in a multispot pattern and 41/64 patients (64%) had both. Fifteen (23%) patients showed only white matter features and no hemorrhagic markers. Sensitivity for probable CAA was similar to the modified Boston criteria: 11/35 (31%) in presymptomatic patients and 29/29 (100%) in patients with a history of symptomatic ICH. The sensitivity for possible CAA increased from 0/35 to 15/35 (43%) in presymptomatic patients compared to the modified Boston criteria.

Conclusions: Our results demonstrate that the new Boston criteria increase the sensitivity for detecting possible CAA in pre-symptomatic D-CAA patients and therefore improve the detection of the early phase of CAA compared to previous criteria.

Disclosure of interest: No

Characteristic	All (n=64)	no symptomatic ICH (n=35)	Symptomatic ICH (n=29)
Age, mean (SD)	49.1 (12.2)	42.1 (11.5)	57.6 (6.2)
Female sex (%)	35/64 (55%)	22/35 (63%)	13/29 (49%)
Hypertension (%)	14/64 (22%)	6/35 (17%)	8/29 (28%)
Presence of hemorrhagic markers (%)	40/64 (63%)	11/35 (31%)	29/29 (100%)
Cortical microbleeds (CMBs)	40/64 (63%)	11/35 (31%)	29/29 (100%)
Lobar macrobleed	33/64 (50%)	4/35 (11%)	29/29 (100%)
Cortical superficial siderosis (cSS)	20/64 (31%)	2/35 (6%)	18/29 (62%)
Convexity subarachnoid hemorrhage (cSAH)	0/64 (0%)	0/64 (0%)	0/64 (0%)
Presence of white matter features (%)	55/64 (86%)	26/35 (74%)	29/29 (100%)
Only multispot	4/64 (6%)	2/35 (6%)	2/29 (7%)
Only severe CSO-PVS	10/64 (16%)	10/35 (29%)	0/29 (0%)
Both	41/64 (64%)	14/35 (40%)	27/29 (93%)

Table 1: Baseline characteristics and radiological MRI-markers

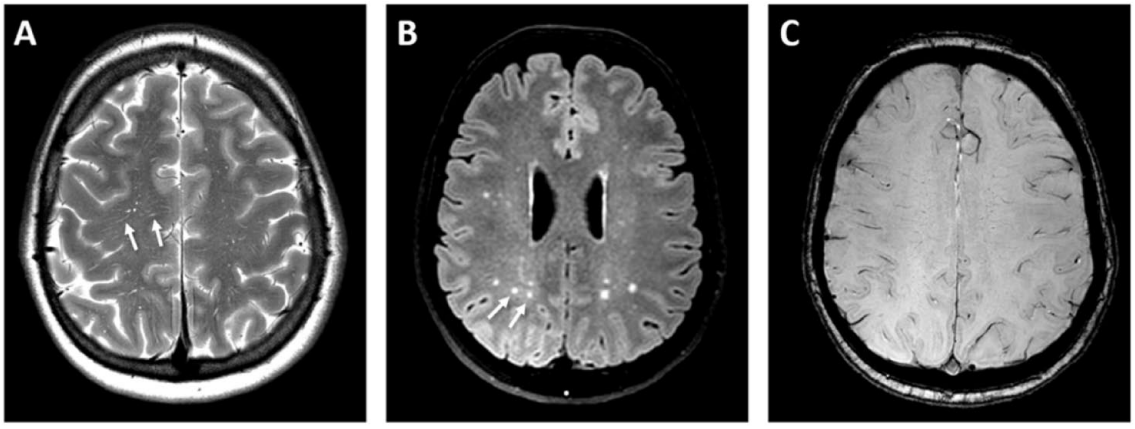

Figure 2. Example of patient with possible CAA according to the Boston criteria v2.0
3T-MRI imaging of a 36-year old female pre-symptomatic participant with D-CAA showing severe (>20 in one hemisphere) visible perivascular spaces in the centrum semiovale (CSO-EPVS) on axial T2-weighted imaging (A, 2 visible CSO-EPVS are annotated by arrows), white matter hyperintensities in a multispot pattern on axial Fluid Attenuated Inversion Recovery (FLAIR) image (B, 2 white matter hyperintensities are annotated by arrows), and no hemorrhagic MRI markers on susceptibility weighted imaging (SWI, C). According to the modified Boston criteria this patient does not fulfill the criteria of possible or probable CAA. However, due to the addition of white matter features, this patient fulfills the criteria for possible CAA according to the Boston criteria version 2.0.

O055/1168

Scientific Communication SC10 - Hyperacute Management

BLOOD PRESSURE TRAJECTORIES AND OUTCOMES AFTER ENDOVASCULAR THROMBECTOMY FOR ACUTE ISCHEMIC STROKE: AN INDIVIDUAL PATIENT DATA META-ANALYSIS

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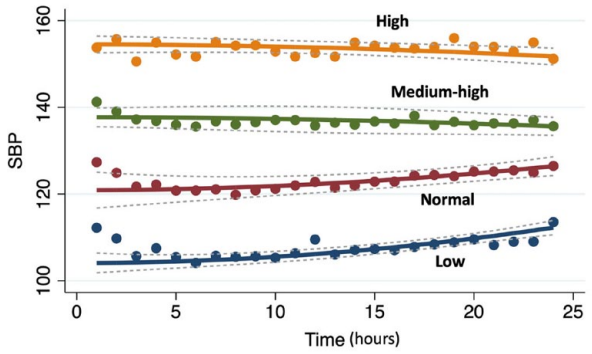
Background and aims: Data on systolic blood pressure (SBP) trajectories in the first 24 hours after endovascular thrombectomy (EVT) in acute ischemic stroke (AIS) are limited. We sought to identify these trajectories and relationship to outcomes.

Methods: We combined individual-level data from 5 studies of patients with AIS who underwent EVT and had individual BP values after the end of the procedure. We used group-based trajectory analysis to identify the number and shape of SBP trajectories post-EVT. We used mixed effects logistic regression to identify association between trajectory groups and outcomes, adjusting for age, sex, stroke severity, co-morbidities, and TICI 2b or higher recanalization.

Results: There were 4,106 total patients with AIS included in the analysis who had SBP measurements after EVT. The most parsimonious model identified 4 distinct SBP trajectories (Figure): high (mean SBP=157 mmHg; 20% of sample), medium-high (mean SBP=137 mmHg; 37% of sample), normal (mean SBP=123 mmHg; 28% of sample), and low (mean SBP=107, 16% of sample). The highest odds of 90-day disability (modified Rankin Scale scores>2) was documented in the high SBP-trajectory group (OR=1.70,95%CI: 1.36-2.13), followed by medium-high SBP-trajectory group (OR=1.35,95%CI:1.12-1.62). Compared to the normal BP trajectory group, the highest odds of 90-day mortality were found in the high group (OR=1.78,95%CI:1.37-2.32), followed by the low group (OR=1.43,95%CI:1.06-1.96), and the medium-high group (OR=1.37,95%CI:1.08-1.74). No association with symptomatic intracranial hemorrhage was identified.

Conclusions: After EVT for AIS, high or low SBP trajectories are associated with higher 90-day mortality, and high trajectories are associated with greater 90-day disability.



Disclosure of interest: No

O056/1864

Scientific Communication SC10 - Hyperacute Management

A RETROSPECTIVE STUDY ON DEEP LEARNING-ENABLED STROKE RECOGNITION FOR A MEDICAL HELP LINE

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Background and aims: Healthcare telecommunicators are the gateway to hospital admittance and advanced stroke treatment in many countries; however, many strokes are not recognised at this level. To address this issue, we designed and tested a machine learning framework for stroke recognition on audio calls.

Methods: Using data from the Danish Stroke Registry and call data from Copenhagen EMS from 2015-2019, we identified stroke recognition by healthcare telecommunicators. The 2015-2019 data was used to train a two-step machine learning framework to first transcribe the call audio and then use the text to predict the risk of stroke. The performance of the machine learning framework was evaluated on a large random sample of call data.

Results: In the machine learning framework training material, we included 807,191 contacts to the medical helpline of which 3,637 were considered strokes. The evaluation dataset contained 146,093 calls and 364 strokes.

Healthcare telecommunicators had a precision (positive predictive value) of 0.197 and a recall (sensitivity) 0.238, leading to a F1-score of 0.216. The machine learning framework had a precision (positive predictive value) of 0.323 and a recall (sensitivity) 0.452, leading to a F1-score of 0.377.
Conclusions: Using audio call data from stroke and non-stroke patients, we were able to train a machine learning framework to recognise stroke based on audio call data for medical helpline calls. The model outperformed the healthcare telecommunicators and may, in the future, become a supplemental tool for healthcare telecommunicators to aid in early and precise stroke recognition.
Disclosure of interest: No

O057/2326

Scientific Communication SC10 - Hyperacute Management

BEST REVASCULARIZATION APPROACH FOR POSTERIOR CIRCULATION STROKES WITH ISOLATED VERTEBRAL ARTERY OCCLUSIONS: RESULTS FROM THE "BRAVO" RETROSPECTIVE STUDY

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Background and aims: Best revascularization treatment of acute ischemic stroke (AIS) with concomitant isolated intra and/or extracranial vertebral artery occlusions (iVAO) is unknown. We aimed at investigating the impact of acute recanalization treatments in AIS with iVAO in a multicentric retrospective study within the EVATRISP* and BRAVO** collaborations.
Methods: We included consecutive patients with posterior-circulation AIS and iVAO from 29 centers, with variable center-specific inclusion periods between 2003 and 2021. We excluded patients with non-disabling symptoms according to the treating physician, and those with missing 3-month modified Rankin scale (mRS). We compared 1) intravenous thrombolysis (IVT) vs conservative treatment (CTx) and 2) endovascular treatment (EVT±IVT) vs best medical therapy (BMT=CTx±IVT). We assessed 3-month favorable mRS-shift applying ordinal regression analyses using other prognostic co-variates. Clinicaltrials.gov registration-number: NCT05503212.
Results: Among 526 consecutive iVAO patients (median age (IQR) 66.2years (56.7-77.2), 27.2% female, median NIHSS 4(2-7)), 171(33%) had CTx, 239(45%) IVT only and 116(22%) EVT±IVT(60 bridging). We did not find any significant difference in the mRS-shift comparing IVT with CTx (common-adjusted odds-ratio [c_{adj}OR]= 0.86,95%CI=0.60-1.24,p=0.43) nor EVT with BMT (c_{adj}OR=0.92,95%CI=0.57-1.48,p=0.73). Symptomatic intracranial hemorrhage rates were similar among the three groups (CTx=0.6%, IVT=1.7%, EVT=4.2%,p>0.05). Early neurological deterioration rates were similar between IVT and CTx (2.5% vs 5.5%), but increased with EVT vs. BMT (17% vs. 4%,p<0.01).
Conclusions: In this largest ever retrospective multicenter analysis of consecutive AIS with iVAO, performing acute revascularization by any method (IVT and/or EVT) did not seem to influence medium-term functional outcome. Randomized clinical trials are needed to establish the best acute treatment.

EVATRISP* collaborators	BRAVO ** collaborators
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Disclosure of interest: No

O058/2368

Scientific Communication SC10 - Hyperacute Management

SAFETY OF INTRAVENOUS CANGRELOR VERSUS DUAL ORAL ANTIPLATELET LOADING THERAPY IN ENDOVASCULAR TREATMENT OF TANDEM LESIONS

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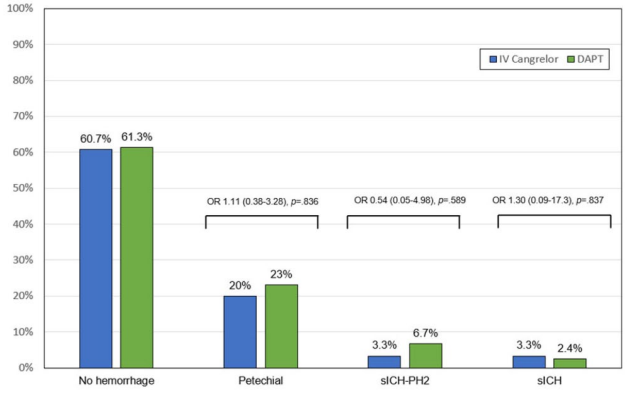
Background and aims: Procedural intravenous (IV) cangrelor has been proposed as a valuable option in the management of procedural platelet inhibition for stenting in acute ischemic stroke. We aimed to compare the safety profile of IV cangrelor versus dual oral antiplatelet therapy (DAPT) loading in patients with acute cervical tandem lesions (TLs).

Methods: We identified all cases of intraprocedural administration of IV cangrelor or DAPT loading during acute TLs intervention from a pooled patient-level data international multicenter collaboration. Safety outcomes included rates of symptomatic intracranial hemorrhage (sICH), parenchymal hematoma (PH2), petechial hemorrhage, and in-stent thrombosis. Inverse probability weighting (IPW) matching was used for comparisons.

Results: From 691 patients, we included 195 patients, 30 received IV cangrelor and 165 DAPT. The dose regimen of cangrelor was a bolus of 15mcg/kg followed by an IV infusion of 2mcg/kg/min. The DAPT regimens were aspirin 325-600mg + clopidogrel 300-600mg (93.3%) or aspirin 325mg + ticagrelor 81mg (6.6%). After IPW, we found no differences between groups for sICH (OR = 1.30; 95% CI 0.09 – 17.3; p = 0.837), sICH-PH2 (OR = 0.54; 95% CI 0.05 – 4.98; p = 0.589), nor petechial hemorrhage (OR = 1.11; 95% CI 0.38 – 3.28; p = 0.836). For in-stent thrombosis was higher with DAPT (1.8% vs. 0%; p=0.911).

Conclusions: Cangrelor at half dose of the myocardial infarction protocol showed a similar safety profile compared to commonly used DAPT loading protocols in patients with acute cervical TLs.



Disclosure of interest: No

O059/1343

Scientific Communication SC10 - Hyperacute Management

SEX DIFFERENCES IN CLOT, VESSEL AND TISSUE CHARACTERISTICS IN PATIENTS WITH A LARGE VESSEL OCCLUSION TREATED WITH ENDOVASCULAR THROMBECTOMY

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Background and aims: To improve our understanding of the worse outcome in women after EVT for large anterior vessel occlusion (LVO), we assessed sex-differences in neuroimaging characteristics on CT-(angiography) that might affect outcome.

Methods: We included patients from the MR CLEAN-Registry who underwent EVT for LVO between 2014-2017. We assessed sex-differences in clot, vessel and tissue characteristics. Radiological outcome was the extended thrombolysis in cerebral infarction score (eTICI), clinical outcome was the modified Rankin Scale score (mRS) at 90 days. Data were analyzed with multivariable regression analyses adjusted for possible confounders.

Results: 3180 patients were included (median age 72 years, 48% women). Clots in women were less often located in the intracranial internal carotid artery (ICA) (OR=0.85;95%CI:0.73-1.00). Intracranial (aOR=0.73;95% CI:0.62-0.87) and extracranial (aOR=0.64;95%CI:0.43-0.95) atherosclerosis was less prevalent in women. Vessel tortuosity was more frequent

Figure 1A. Distribution of eTICI after EVT

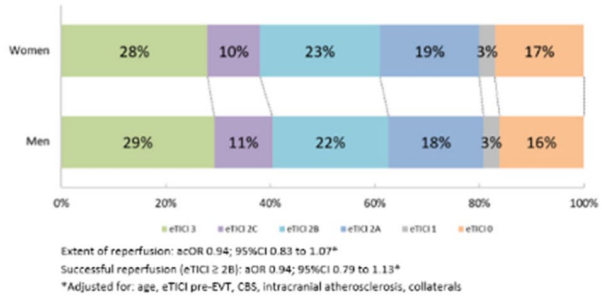

Figure 1B. Distribution of mRS at 90 days

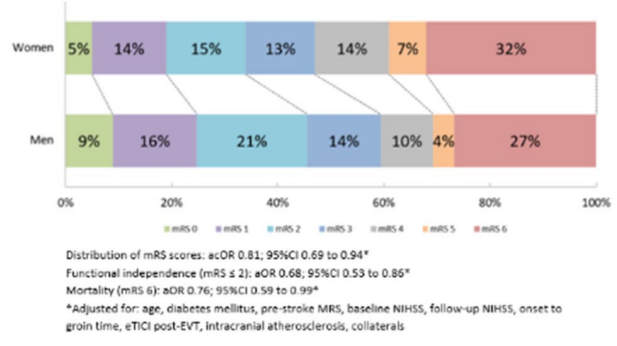

Table 1. Radiological parameters compared between women and men

Neuroimaging characteristics	Women	Men	p value
Clot characteristics			
Clot location			
Intracranial ICA / ICA-T – no. (%)	360/1458 (25)	435/1566 (28)	0.05
M1 – no. (%)	874/1458 (60)	890/1566 (57)	0.08
M2 – no. (%)	214/1458 (15)	227/1566 (15)	0.89
Other: M3/anterior – no. (%)	10/1458 (1)	14/1566 (1)	0.52
Clot extent			
Median clot burden score (IQR)	6 (4-8)	6 (4-8)	0.71
Clot burden score < 7 – no. (%)	721/1187 (61)	729/1247 (59)	0.25
Vessel characteristics			
Vessel aspects			
Presence of intracranial atherosclerosis – no. (%)	877/1462 (60)	959/1588 (60)	0.82
Presence of extracranial atherosclerosis (ICA) – no. (%)	275/398 (69)	306/421 (73)	0.26
ICA stenosis ≥ 70% – no. (%)	90/679 (13)	203/741 (27)	<0.001
ICA stenosis ≥ 99% – no. (%)	70/679 (10)	183/741 (25)	<0.001
Anatomical aspects			
≥ 1 angles > 90° in supra-aortic arteries – no. (%)	175/410 (43)	163/453 (36)	0.04
≥ 1 angles > 90° in cervical internal carotid arteries – no. (%)	226/366 (62)	155/344 (45)	<0.001
Aortic arch type III – no. (%)	129/537 (24)	88/570 (15)	<0.001
Median radius ICA – mm. (IQR)	2.3 (2.1-2.6)	2.5 (2.3-2.8)	0.002
Median radius M1 – mm. (IQR)	1.6 (1.4-1.8)	1.7 (1.5-1.9)	0.11
Collateral status			
Absent collaterals – no. (%)	69/1434 (5)	117/1544 (8)	0.002
Filling < 50% of occluded area – no. (%)	470/1434 (33)	602/1544 (39)	<0.001
Filling > 50% but less than 100% – no. (%)	593/1434 (41)	561/1544 (36)	0.005
Filling 100% of occluded area – no. (%)	302/1434 (21)	264/1544 (17)	0.006
Tissue characteristics			
Median ASPECTS (IQR)*	9 (8-10)	9 (7-10)	0.05
ASPECTS 0-4 – no. (%)*	65/1366 (5)	72/1499 (5)	0.98
ASPECTS 5-7 – no. (%)*	266/1366 (20)	321/1499 (21)	0.20
ASPECTS 8-10 – no. (%)*	1035/1366 (76)	1106/1499 (74)	0.22
ASPECTS < 8 – no. (%)*	331/1366 (24)	393/1499 (26)	0.22

Abbreviations: ICA = internal carotid artery; ICA-T = internal carotid artery terminal; M1 / 2 / 3 = middle cerebral artery segment 1 / 2 / 3; IQR = interquartile range; ASPECTS = Alberta Stroke Program Early CT Score
*Cases with an anterior cerebral artery segment 1 or 2 occlusion excluded

in women in the cervical ICA (aOR=1.89;95%CI:1.39-2.57) and women more often had severe elongation of the aortic arch (aOR=1.38;95% CI:1.00-1.91). ICA radius was smaller in women (2.3mm versus 2.5mm, mean difference (β) 0.22;95%CI:0.09-0.35), M1 radius was equal (1.6mm versus 1.7mm, β=0.09;95%CI:-0.02-0.21). Women had better collateral status (aOR=1.48;95%CI:1.29-1.70). ASPECT scores were equal (median 9 in both sexes). Successful reperfusion was similar between sexes (aOR=0.94 for eTICI⩾2B;95%CI:0.79-1.13). However, women had worse clinical outcome at 90 days (aOR=0.68 for mRS⩽2;95%CI:0.53-0.86).

Conclusions: On baseline imaging, men and women with LVO mainly differ in vessel characteristics. These differences do not result in different reperfusion rates and are not likely to explain the worse clinical outcome in women after EVT.

Table 2A. Unadjusted and adjusted effect estimates of sex on neuroimaging characteristics (imputed data)

Neuroimaging characteristics	Effect Variable	Unadjusted Value (95% CI)	Adjusted Value (95% CI)
Clot location			
Intracranial ICA / ICA-T	OR (95% CI)	0.85 (0.73 to 1.00)	X[a]
M1	OR (95% CI)	1.14 (0.98 to 1.31)	X[a]
M2	OR (95% CI)	1.02 (0.83 to 1.24)	X[a]
Other: M3 / anterior	OR (95% CI)	0.77 (0.34 to 1.73)	X[a]
Clot burden score	ß (95% CI)	-0.05 (-0.25 to 0.15)	0.10 (-0.09 to 0.30)[b]
Presence of intracranial atherosclerosis	OR (95% CI)	0.98 (0.84 to 1.13)	0.73 (0.62 to 0.87)[c]
Collateral status	cOR (95 CI)	1.40 (1.23 to 1.60)	1.48 (1.29 to 1.70)[d]
ASPECTS*	ß (95% CI)	-0.14 (-0.31 to 0.03)	-0.14 (-0.31 to 0.02)[d]

Abbreviations: ICA = internal carotid artery; ICA-T = internal carotid artery terminal; M1 / 2 / 3 = middle cerebral artery segment 1 / 2 / 3; ASPECTS = Alberta Stroke Program Early CT Score; OR = Odds Ratio; CI = confidence interval; β = mean difference; cOR = common Odds Ratio
[a]Adjustments not desirable methodologically, [b]Adjusted for age, time to groin, and collateral status [c]Adjusted for age, smoking, hypertension, hypercholesterolemia and diabetes mellitus, [d]Adjusted for age and time to groin. *Cases with an anterior cerebral artery segment 1 or 2 occlusion excluded

Table 2B. Unadjusted and adjusted effect estimates of sex on neuroimaging characteristics (unimputed data)

Neuroimaging characteristics	Effect Variable	Unadjusted Value (95% CI)	Adjusted Value (95% CI)
Presence of extracranial atherosclerosis (ICA)	OR (95% CI)	0.84 (0.60 to 1.18)	0.64 (0.43 to 0.95)[a]
ICA stenosis ≥ 70%	OR (95% CI)	0.33 (0.24 to 0.46)	0.34 (0.25 to 0.47)[a]
ICA stenosis ≥ 99%	OR (95% CI)	0.27 (0.19 to 0.38)	0.27 (0.19 to 0.39)[a]
≥ 1 angles > 90° in supra-aortic arteries	OR (95% CI)	1.30 (0.98 to 1.71)	1.11 (0.82 to 1.49)[b]
≥ 1 angles > 90° in cervical internal carotid arteries	OR (95% CI)	1.98 (1.46 to 2.67)	1.89 (1.39 to 2.57)[b]
Aortic arch type III	OR (95% CI)	1.75 (1.29 to 2.38)	1.38 (1.00 to 1.91)[b]
Radius ICA	ß (95% CI)	0.22 (0.09 to 0.35)	X[c]
Radius M1	ß (95% CI)	0.09 (-0.02 to 0.21)	X[c]

Abbreviations: ICA = internal carotid artery; OR = Odds Ratio; CI = confidence interval; β = mean difference
[a]Adjusted for age, smoking, hypertension, hypercholesterolemia and diabetes mellitus, [b]Adjusted for age and hypertension, [c]Adjustments not desirable methodologically

Disclosure of interest: No

O060/1485

Scientific Communication SC10 - Hyperacute Management

PREHOSPITAL STROKE RECOGNITION SCALES: A HEAD-TO-HEAD COMPARISON OF 12 SCALES IN PATIENTS WITH SUSPECTED STROKE

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Background and aims: Several prehospital stroke recognition scales have been developed to accelerate IV thrombolysis (IVT) and endovascular thrombectomy (EVT). We compared diagnostic performance of these scales to distinguish true strokes from stroke mimics in a large cohort of stroke code patients.

Methods: We used data from two prospective cohort studies (Leiden-PSS and PRESTO) that included consecutive stroke code patients between 2018 and 2019. Assessment of neurological deficits on-site was standardised and documented in an application before hospital arrival, allowing the reconstruction of 12 prehospital stroke scales: FAST, CPSS, LAPSS, MASS, OPSS, MedPACS, FPSS, BE-FAST, PreHAST, sNIHSS, ROSIER and CIVIL-ASAP. Outcomes were (i) several diagnostic performance measures to detect stroke including accuracy, sensitivity and specificity, and (ii) the proportion of missed IVT/EVT-treated strokes.

Results: Of 3317 stroke code patients, 2240 (67.5%) had a stroke (1528 ischemic, 470 TIA and 242 haemorrhagic) and 1077 (32.5%) a stroke mimic. Of ischemic stroke patients, 715 (46.8%) received IVT and/or EVT. Sensitivity ranged from 66% (LAPSS) to 87% (BE-FAST) and specificity from 29% (PreHAST) to 49% (LAPSS). BE-FAST had the highest accuracy (69%) and lowest proportion of missed IVT/EVT-treated strokes (5.9%), whilst LAPSS had lowest accuracy (61%) and missed most IVT/EVT-treated strokes (24.9%).

Conclusions: We found that all 12 prehospital stroke recognition scales had high accuracy and sensitivity, with BE-FAST performing best. However, specificities were low and all scales missed IVT/EVT-treated strokes. Hence, adhering to a prehospital stroke scale will decrease unnecessary stroke code activations, but at a cost of missing IVT/EVT-eligible stroke patients.

Disclosure of interest: No

O061/2585

Scientific Communication SC10 - Hyperacute Management

CLINICAL VIDEO ASSESSMENT FOR STROKE (CVAS) IMPROVES PATIENT SELECTION FOR HYPERACUTE STROKE UNIT CARE WITHOUT INCREASING OVERALL TREATMENT TIMES IN UNCOMPLICATED THROMBOLYSIS CASES

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Background and aims: Pre-hospital clinical video assessment of stroke (CVAS) is reported to improve selection of patients for specialist stroke care at the potential cost of increasing time from ambulance crew arrival on scene to treatment delivery. In this study we aimed to explore whether CVAS increased time to treatment in thrombolysed cases at a high volume hyperacute stroke service.

Methods: We reviewed all cases admitted to the UCLH service between June 2020 and October 2022 with or without CVAS. Detailed data were captured for all patients. Treatment times were compared for the cohort receiving thrombolysis and prior CVAS against a contemporaneous cohort without prior CVAS. Further distribution analyses were performed, including Fligner Killeen test to assess the homogeneity of variance between the two groups.

Results: 4597 patients were triaged with CVAS (51% female) with average age 68 years. The accuracy of CVAS decision making was 75% compared to 57% using the FAST screen only. 130 patients with prior CVAS and 93 cases without CVAS received thrombolysis. Median door to needle time was shorter in the CVAS group (32 min vs 37 min, p=0.020). The variance of door to needle time in the CVAS group was also significantly smaller (p=0.029). Median Arrival-On-Scene to treatment time was equivalent for the two groups (90 versus 91 minutes).

Conclusions: CVAS improves patient selection with stroke for transfer to the HASU. Door to Needle times were faster with prior CVAS with less variance. CVAS did not cause an overall increase in time to treatment.

Disclosure of interest: No

O062/243

Scientific Communication SC11 - Neurointervention – Organisation and Outcome

ENDOVASCULAR VS MEDICAL MANAGEMENT OF POSTERIOR CEREBRAL ARTERY OCCLUSION STROKE: THE PLATO STUDY

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Background and aims: The best management of patients with posterior cerebral artery (PCA) occlusion is uncertain. We compared clinical outcomes for endovascular therapy (EVT) versus Medical Management (MM) in patients with isolated PCA occlusion.

Methods: This case-control study conducted at 27 sites included consecutive patients with isolated PCA occlusion within 0-24h onset. Patients treated with EVT or MM (with or without intravenous thrombolysis) were compared using multivariable logistic regression and inverse

probability of treatment weighting. Co-primary outcomes were 90-day ordinal mRS and ⩾2-point NIHSS decrease at 24h or discharge.
Results: We included 1,023 patients (median age (IQR) 74 (64-82) years, 57.6% male, median NIHSS 6 (3-10), 379 (37%) received EVT). PCA occluded segments were: P1 41.2%, P2 49.2%, P3 7.1%. There was no difference in 90-day ordinal mRS (aOR 1.13 95% CI 0.85-1.50, p=0.41). With EVT, there were higher odds of a decrease in NIHSS ⩾2 points adjusting for age, sex, NIHSS, baseline mRS, hypertension, atrial fibrillation, diabetes, PC-ASPECTS, occlusion location, IVT (aOR 1.84 95% CI 1.35-2.52, p<0.001). EVT was associated with excellent clinical outcome (mRS 0-1) and complete vision recovery despite higher rates of SICH and mortality (sICH: 6.2% vs 1.7%, p<0.001; mortality: 10.1% vs 5.0%, p=0.002).
Conclusions: In patients with isolated PCA occlusion, compared to MM alone, EVT was associated with higher likelihood of early neurological improvement but didn't improve odds for reduced disability. There was a higher proportion of patients achieving excellent outcome and vision recovery in the EVT group despite higher rates of sICH and mortality.
Disclosure of interest: Yes

O063/1007

Scientific Communication SC11 - Neurointervention – Organisation and Outcome

PROFILING ACUTE STROKE PATIENTS REQUIRING INTRACRANIAL STENTING DURING ENDOVASCULAR TREATMENT. AN OBSERVATIONAL STUDY FROM THE CATALAN STROKE REGISTRY

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Background and aims: In stroke patients undergoing Endovascular Treatment (EVT), pre-procedure identification of those requiring intracranial stenting as rescue therapy may allow anticipating procedural strategies. This study aimed to determine clinical and radiological features associated to receiving intracranial stenting during EVT.
Methods: We analyzed stroke patients who received EVT included in the Catalan Stroke Registry (CICAT) between 2019-2022. Univariate and multivariate analysis were performed to determine factors associated to intracranial stenting. A logarithm was used to create a predictive model using variables previously selected.
Results: From 984 included patients, 67(6.8%) received intracranial stenting. In 54% of these, at least 3 attempts with conventional thrombectomy-devices were performed before intracranial stenting. Final recanalization TICI2c-3 was achieved in 46(68.6%). Stenting patients were younger (66.1years vs.72.3, p<0.001), had lower baseline NIHSS (12 vs.16, p=0.003), less frequently in female sex (35.8% vs 48.6%, p=0.043), atrial fibrillation (2.9% vs.24.1%, p=0.001) M2-MCA occlusions (9.6% vs.23.8%, p=0.008). In a logistic regression, lower baseline NIHSS (OR:0.953, 95%CI:0.918-0.99, p=0.012), absence of atrial fibrillation (OR:9.657, 95%IC:2.274-41.012, p=0.002) and proximal occlusion (OR:3.094, 95%CI:1.268-7.553, p=0.013) were independent factors associated to receiving intracranial stenting. A predictive model based on age, sex, baseline NIHSS, ASPECTS, occlusion site and atrial fibrillation showed an accuracy:0.75, sensitivity:0.70 and specificity:0.76.
Conclusions: In the present study, during EVT, a non-negligible rate of patients received intracranial stenting, being performed after several attempts in more than half of them. Non-atrial fibrillation, proximal occlusion, and lower baseline NIHSS were associated to intracranial stenting. A predictive clinical-radiological model could be useful to identify these patients before intervention.
Disclosure of interest: No

O064/1750

Scientific Communication SC11 - Neurointervention – Organisation and Outcome

ENDOVASCULAR TREATMENT VS MEDICAL MANAGEMENT IN DISTAL EMERGENT VASCULAR TERRITORY OCCLUSION STROKES: ENDEAVOR STUDY

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Background and aims: Endovascular treatment(EVT) is the standard of care for proximal vessel occlusion strokes. However, the safety and efficacy of EVT for distal vessel occlusions(DVO) remain unclear. We sought to compare the clinical outcomes of EVT to medical management(MM) for isolated DVO.
Methods: Data from 7 comprehensive stroke centers were reviewed. Patients were included if they had isolated DVO stroke due to MCA-M3/M4, ACA-A2/3 or PCA-P1/2/3 segments. Propensity score matching was used to balance the two groups. The primary outcome was the shift in the degree of disability as measured by the modified Rankin Scale(mRS) at 90 days. Secondary outcomes included good outcome(90-day mRS0-2) and excellent outcome(90-day mRS0-1). Safety measures included symptomatic intracranial hemorrhage(sICH) and 90-day mortality.
Results: Among 321 patients included in the analysis, 198 were matched at a 1:1 ratio. Baseline characteristics were balanced between both groups. EVT had comparable outcomes to MM in terms of the overall degree of disability(mRS ordinal shift;aOR1.15, 95% CI[0.69-1.92],P=0.59), rates of good and excellent outcomes at 90 days, and rates of sICH. However, subgroup analyses favored EVT in achieving excellent outcome in patients with NIHSS score⩾8(aOR3.70, 95%CI[1.26-10.89],P=0.018). EVT had similar rates of 90-day mortality(aOR1.23, 95%CI[0.30-5.03],P=0.77) in

anterior circulation DVO, but significantly higher rates in posterior circulation DVO(aOR4.55, 95%CI[1.11-18.67],P=0.035) compared to MM.
Conclusions: EVT was associated with similar odds of disability by ordinal mRS, but significantly higher rates of excellent outcome in patients presenting with moderate or severe strokes. Mortality was higher with EVT in those with posterior circulation DVO.
Disclosure of interest: No

O065/21

Scientific Communication SC11 - Neurointervention – Organisation and Outcome

EFFECT OF BRIDGING THROMBOLYSIS ON THE EFFICACY OF STENT RETRIEVER THROMBECTOMY TECHNIQUES – INSIGHTS FROM THE SWIFT-DIRECT TRIAL

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Background and aims: There is little available data regarding the influence of intravenous thrombolysis(IVT) on the efficacy of different first line mechanical thrombectomy(MT) techniques.
Methods: We used the dataset of the SWIFT-DIRECT trial which randomized 408 patients to IVT+MT or MT alone at 48 international sites. The protocol required the use of a stent retriever(SR), but concomitant use of a balloon guide catheter(BGC) and/or distal aspiration(DA) catheter was left to the discretion of the operators. Four first line techniques were applied in the study population: SR, SR+BGC, SR+DA, SR+DA+BGC. To assess whether the effect of IVT+MT versus MT alone was modified by first line technique, interaction models were fitted for predefined outcomes. The primary outcome was first pass mTICI 2c-3 reperfusion(FPR).
Results: We included 385 patients, of which 172 were treated with SR+DA, 121 with SR+DA+BGC, 57 with SR+BGC and 35 with SR. There was no evidence that the effect of IVT+MT versus MT alone would be modified by the choice of first line technique. However, allocation to IVT+MT increased the odds of FPR by a factor of 1.68(95%CI 1.11-2.54). The use of SR+BGC increased the odds of FPR compared to SR+DA and SR. SR+BGC also increased the odds of functional independence and decreased the odds of hemorrhagic transformation compared to SR, SR+DA and SR+DA+BGC.
Conclusions: This post-hoc analysis does not suggest treatment effect heterogeneity of IVT+MT vs MT alone in different stent-retriever techniques, but provides evidence for increased FPR if bridging IVT is administered before stent retriever thrombectomy.
Disclosure of interest: No

O066/1394

Scientific Communication SC11 - Neurointervention – Organisation and Outcome

NEUTRAL FLUID MANAGEMENT ON ICU AFTER THROMBECTOMY IN ISCHEMIC STROKE IS ASSOCIATED WITH GOOD NEUROLOGICAL AND CLINICAL OUTCOMES

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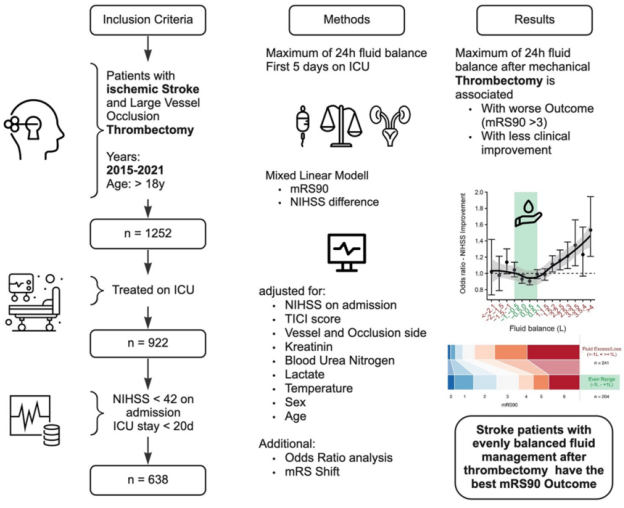
Background and aims: The standard acute treatment for ischemic stroke is a combination of intravenous lysis therapy and endovascular thrombectomy followed by ICU admission of those patients who require mechanic ventilation. Fluid management is a crucial aspect of ICU care; however, no recommendations exist regarding optimal fluid balance in stroke patients. This study aimed to define ranges of fluid balance associated with the most favorable outcome following thrombectomy.
Methods: A retrospective, single-center study was conducted at the University Medical Center Hamburg-Eppendorf in Germany between 06/2015 and 09/2020. All stroke patients who received thrombectomy and were treated on ICU. Favorable clinical outcome was defined by mRS90 $<$ 3 and an improvement in NIHSS. The maximum value from the first five days of the daily fluid balance was used to calculate a mixed linear regression model to predict favorable outcome. Additionally, Odds ratio analysis and mRS shift analysis was done for patients who were within the favorable fluid balance range.
Results: 638 patients met the inclusion criteria of this study (mean ±SD; Age: 72.9y ±13.1, Stay on ICU: 3.3d ±3.3). Unfavorable mRS90 and



NIHSS worsening were significantly associated with larger volumes of maximum fluid balance in the first five days on ICU (mRS90 P=0.0400, NIHSS P=0.0382). The fluid balance between -1L and +1L was associated with favorable outcomes. The mRS shift analysis was significant (P<0.00001) for patients inside optimal range of fluid balance.
Conclusions: Neutral fluid management on ICU in stroke patients undergoing thrombectomy is associated with favorable outcome.
Disclosure of interest: No

O067/2416

Scientific Communication SC11 - Neurointervention – Organisation and Outcome

ENDOVASCULAR TREATMENT IN OCTOGENARIANS. WHAT CAN WE EXPECT? A SECONDARY ANALYSIS OF THE ROSSETTI REGISTRY

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Background and aims: Octogenarians represent a growing proportion of candidates for endovascular treatment (EVT). Most of the evidence regarding this topic derives from retrospective or small prospective single-center observational studies and sub-analysis of clinical trials. We aim to evaluate the efficacy and safety of EVT in octogenarians in a large, prospective, multi-center registry.
Methods: Data from consecutive patients with anterior circulation stroke treated with EVT across 15 Comprehensive Stroke Centers were collected from the ROSSETTI Registry. Patients were categorized into two age groups: ⩾80 and <80 years old. Demographic, clinical data, procedural details and outcomes of both groups were compared, and multivariate analyses were performed among the subgroup of patients over 80 years old.
Results: 1,728 patients were included in the analysis. Compared to young patients, octogenarians presented similar groin-to-recanalization times (median 33 vs 35, p=0.34), rates of FPE (43.3% vs 43.3%, p=0.98), successful recanalization (92.1% vs 91.1%, p=0.46) and complete recanalization (72.6% vs 72%, p=0.75), with fewer sICH rates (6.6% vs 8.4%, P=0.02). Clinical outcomes were worse in octogenarians, although 37.5% of patients achieved a mRS 0-2 and 50.5% a mRS ⩽3 at three months
Conclusions: With modern techniques, technical outcomes of EVT in octogenarians are in line with those of younger patients, achieving similar recanalization rates. Endovascular treatment provides high rates of good functional outcome in octogenarians with severe strokes, with up to 37.5% of functional independence (mRS ⩽2) and over 50% of acceptable clinical outcome (mRS⩽3) at three months.
Disclosure of interest: No

O068/215

Scientific Communication SC12 - Epidemiology (including gender and sex topics)

DIVERGING TRENDS IN INCIDENCE OF INTRACEREBRAL HEMORRHAGE IN SWEDEN 2010–2019 – A RIKSSTROKE STUDY

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Background and aims: To investigate incidence trends in spontaneous intracerebral hemorrhage (ICH) in Sweden between 2010 and 2019 with focus on oral anticoagulant (OAC)-related and non-OAC-related ICH.
Methods: We included patients (⩾18 years) with first-ever stroke from ICH registered in the hospital-based Swedish Stroke Register (Riksstroke) 2010 to 2019. Data were analyzed for 2010–2012, 2013–2016 and 2017–2019.
Results: Between 2010 and 2019, 22,289 patients with ICH were registered; 18,325 (82.2%) patients with non-OAC ICH and 3,964 (17.8%) patients with OAC ICH. Annual crude incidence (per 100,000) of all ICH decreased by 10% from 29.5 (95% CI 28.8–30.3) to 26.7 (95% CI 26.0–27.3) between 2010–2012 and 2017–2019. The crude incidence rate of non-OAC ICH decreased by 20% from 25.7 (95% CI 25.0–26.3) to 20.7 (95% CI 20.1–21.2) whereas OAC ICH increased by 56% from 3.86 (95% CI 3.61–4.12) to 6.01 (95% CI 5.70–6.32). Age-specific proportional changes were largest in patients ⩾85 years with a decrease in non-OAC ICH by 32% from 155 (95% CI 146–164) to 106 (95% CI 98.6–113) and an increase in OAC ICH by 155% from 25.7 (95% CI 22.1–29.4) to 65.5 (95% CI 59.9–71.2).
Conclusions: The 20% decline in non-OAC ICH in Sweden between 2010 and 2019 is similar to recently reported trends in first-ever ischemic stroke. However, OAC ICH increased by 56%. Patients ⩾85 years showed the largest proportional changes in both OAC and non-OAC ICH.
Disclosure of interest: No

O069/2185

Scientific Communication SC12 - Epidemiology (including gender and sex topics)

Differences in Risk Factor Control in Patients with Stroke versus Myocardial Infarction:Combined Results from the UK Biobank and the All of Us Research Program

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Background and aims: Cardiovascular risk factor management is a central focus of prevention strategies after vascular events. We sought to

determine whether cardiovascular risk factors are similarly controlled in patients with a history of stroke and myocardial infarction (MI).

Methods: We performed a cross-sectional analysis in the UKBiobank (UKB) and All of Us Research Program (AoU). We included participants who had a prior history of stroke or myocardial infarction at enrollment. We evaluated the unadjusted and adjusted prevalence of controlled risk actors: LDL<100mg/dL, systolic<140mmHg and diastolic blood pressure<90mmHg, statin use, antiplatelet use, and a binary control score defined as the presence of at least three of the four control indicators. In AoU, we tested for effect modification of the control score by age, sex, race/ethnicity, and neighborhood deprivation levels.

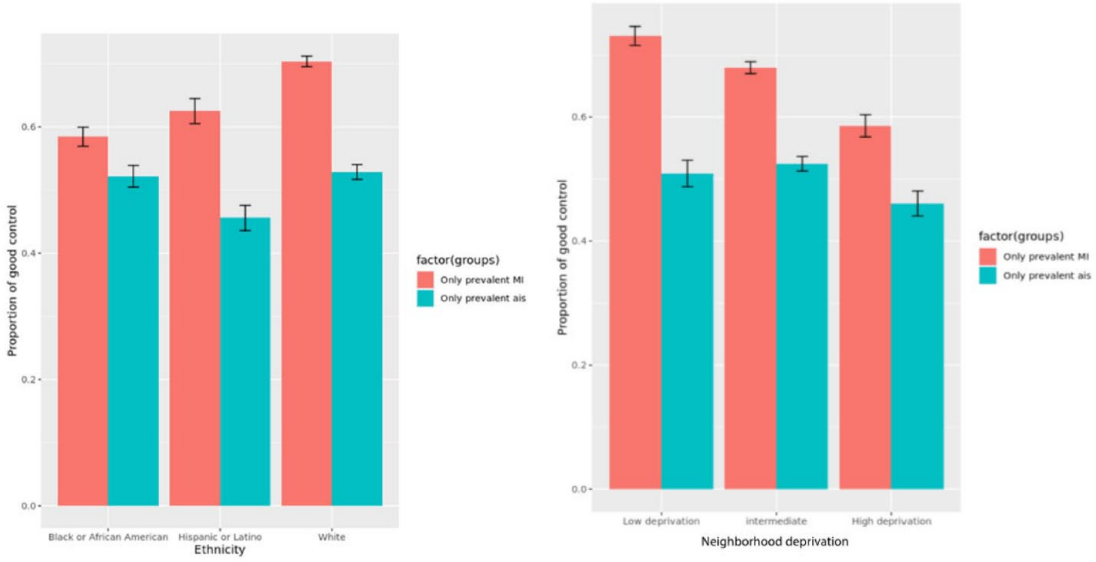
Results: We included 14,760 UKB participants and 8,608 from AoU. In UKB, compared to MI participants, those with a history of stroke had lower odds of LDL control (odds ratio[OR]:0.73;95% confidence interval[CI]:0.68-0.78;p<0.001), BP control (OR:0.63;95%CI:0.59-0.68;p<0.001), statin use (OR:0.45;95%CI:0.42-0.48;p<0.001), antiplatelet use (OR:0.54;95%CI:0.49-0.59;p<0.001), and good control score (OR:0.42;95%CI:0.39-0.45;p<0.001). All results were replicated in AoU (all p<0.001), and the odds of having a good control score were significantly modified by race/ethnicity and neighborhood deprivation levels (interaction p<0.05).

Conclusions: In two independent national cohorts, participants with a history of stroke had worse cardiovascular risk factor control and were less likely to be on guideline-directed therapies than patients with a history of myocardial infarction. Further inquiry will be required to determine the reasons behind these differences.

		UK Biobank				All of Us			
		Overall	Only prevalent MI	Only prevalent stroke	p	Overall	Only prevalent MI	Only prevalent stroke	p
n		14,760	9,193	5,567		8,608	4,999	3,609	
sex = Male (%)		10,579 (71.7%)	7,446 (81.0%)	3,133 (56.3%)	<0.001	4,338 (50.4%)	2,863 (57.3%)	1,475 (40.9%)	<0.001
Age (mean (SD))		61.23 (6.51)	61.80 (6.13)	60.28 (7.00)	<0.001	65.00 (12.41)	65.91 (11.80)	63.74 (13.10)	<0.001
Age > 65 (%)		5,658 (38.3%)	3,741 (40.7%)	1,917 (34.4%)	<0.001	4,469 (51.9%)	2,742 (54.9%)	1,727 (47.9%)	<0.001
Ethnicity	White	13,928 (94%)	8,659 (94.2%)	5,269 (94.6%)	<0.001	4,760 (55.3%)	2,923 (58.5%)	1,837 (50.9%)	<0.001
	Black	177 (1.2%)	78 (0.8%)	99 (1.8%)		1,924 (22.4%)	1,073 (21.5%)	851 (23.6%)	
	Hispanic or latino	NA	NA	NA		1,210 (14.1%)	589 (11.8%)	621 (17.2%)	
	Asian	388 (2.6%)	286 (3.1%)	102 (1.8%)		131 (1.5%)	74 (1.5%)	57 (1.6%)	
BMI (mean (SD))		29.10 (4.95)	29.36 (4.85)	28.66 (5.08)	<0.001	30.66 (7.27)	30.97 (7.34)	30.23 (7.15)	<0.001

	UK Biobank				All of Us			
	Overall	Only prevalent MI	Only prevalent stroke	p	Overall	Only prevalent MI	Only prevalent stroke	p
n	14,760	9,193	5,567		8,608	4,999	3,609	
LDL [mg/dl] (mean (SD))	108.33 (30.71)	104.51 (28.38)	114.64 (33.26)	<0.001	93.10 (29.19)	90.36 (28.77)	96.90 (29.35)	<0.001
Controlled LDL (<100 mg/dl) (%)	6557 (44.4%)	4479 (48.7%)	2078 (37.3%)	<0.001	5406 (62.8%)	3347 (67.0%)	2059 (57.1%)	<0.001
SBP [mmHg] (mean (SD))	138.02 (18.88)	138.02 (18.88)	140.00 (18.94)	<0.001	129.82 (18.51)	129.37 (18.63)	130.44 (18.33)	0.009
DBP [mmHg] (mean (SD))	79.93 (10.38)	78.58 (10.18)	82.16 (10.31)	<0.001	76.19 (11.47)	75.52 (11.50)	77.13 (11.35)	<0.001
Controlled BP (<140mmHg) (%)	8,025 (54.4%)	5,286 (57.5%)	2,739 (49.2%)	<0.001	5964 (69.3%)	3525 (70.5%)	2439 (67.6%)	0.004
statin use (%)	10,519 (71.3%)	7,267 (79.0%)	3,252 (58.4%)	<0.001	6289 (73.1%)	3888 (77.8%)	2401 (66.5%)	<0.001
antiplatelet use (%)	11,372 (77.0%)	7,947 (86.4%)	3,425 (61.5%)	<0.001	5618 (65.3%)	3557 (71.2%)	2061 (57.1%)	<0.001
Good control score	7932 (53.7%)	5786 (62.9%)	2146 (38.5%)	<0.001	5077 (61.3%)	3372 (66.6%)	1705 (53.1%)	<0.001

Outcome	UK Biobank (n=14,760)		All of Us (n=8,608)	
	Adjusted* OR (95% CI) for Stroke	p	Adjusted** OR (95% CI) for Stroke	p
Controlled LDL	0.73 (0.68-0.78)	<0.001	0.75 (0.68-0.82)	<0.001
Controlled BP	0.63 (0.59-0.68)	<0.001	0.86 (0.78-0.95)	0.002
Statin Use	0.45 (0.42-0.48)	<0.001	0.65 (0.59-0.72)	<0.001
Antiplatelet Use	0.54 (0.49-0.59)	<0.001	0.57 (0.52-0.62)	<0.001
Good control score	0.42 (0.39-0.45)	<0.001	0.52 (0.48-0.57)	<0.001



Disclosure of interest: No

O070/489

Scientific Communication SC12 - Epidemiology (including gender and sex topics)

INEQUITY IN PREHOSPITAL RECOGNITION OF WOMEN WITH STROKE

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Background and aims: Prehospital identification of stroke suspects is crucial for successful and guideline-adherent acute management leading to more patients receiving stroke recanalising treatments and lower risk of death within 3 months. Women with their higher prevalence of non-traditional stroke symptoms are prone to mis-identification. Here, we investigate differences in prehospital stroke identification and management of women compared to men.

Methods: Cohort analysis of consecutive patients with confirmed acute stroke. Primary outcome was the correct prehospital identification of suspected stroke. Secondary outcomes were times spent-on-scene, emergency call-to-hospital and modified Rankin score (mRS) outcome at discharge.

Results: 2091 patients were analysed comprising 46.5% women and 53.5% men. Women were older than men (mean women: 77y±13, men: 71y±13,p<0.001) and had more severe symptoms on admission (mean NIHSS: women: 9±10, men: 8±9,p<0.001). The majority suffered from ischaemic stroke (women: 83%, men 86%). The primary outcome was

significantly different with fewer women (89%) than men (92%) correctly identified as stroke suspects at the emergency site. The Odds ratio for correct identification of the stroke in women was 0.73 (95% CI: 0.54-0.97,p=0.03). Prehospital management times with time-spent-on-scene and time-to-hospital did not differ. Women showed a worse clinical outcome than men at discharge (mRS: women 3±1.9, men 2±1.9,p<0.001).
Conclusions: Correct stroke identification of women with acute stroke seems challenging in the prehospital setting. Further research needs to identify whether prehospital clinician skills or patient-related causes are accountable.
Disclosure of interest: No

O071/1028

Scientific Communication SC12 - Epidemiology (including gender and sex topics)

OUT-OF-HOSPITAL FATAL STROKES IN THE POPULATION-BASED MONGOLIAN STROKE INCIDENCE STUDY: FREQUENCY, CHARACTERISTICS, AND IMPACT ON EPIDEMIOLOGICAL DATA

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Background and aims: Capturing fatal stroke events without hospitalisation is a critical step in accurately estimating incidence and mortality rates attributable to stroke. We conducted a prospective population-based stroke incidence study in Ulaanbaatar, Mongolia, where a unique law requires the cause of all deaths to be verified through autopsy. The aims of our study were to elucidate the frequency, characteristics, and impact on stroke incidence and case fatality of out-of-hospital fatal strokes.
Methods: All adult cases of stroke were prospectively identified in Ulaanbaatar, Mongolia between January 2019 and December 2020. Out-of-hospital fatal strokes were registered through death certificates and the Forensic Institute.
Results: Of a total 3,803 cases (mean age 60±13 years, 38.6% females), 757 (19.9%, 95% CI 18.6-21.2%) were out-of-hospital fatal cases that were older (64±14.2 vs. 59±12.7 years, p<0.001) and had less history of stroke (14.8% vs. 23.5%, p<0.001) than hospitalised cases. Haemorrhagic stroke was more common (81.2% vs. 43.2%, p<0.001) in out-of-hospital fatal cases than hospitalised cases. When removing out-of-hospital fatal cases, the crude annual incidence (per 100,000) declined from 191.8 (95% CI 183.2-200.4) to 153.6 (145.9-161.3) for total stroke and from 116.6 (109.9-123.3) to 101.0 (94.8-107.3) for haemorrhagic stroke. Corresponding 28-day case fatality declined from 35.2% (33.6-36.8%) to 17.9% (16.5-19.3%) for total stroke and from 52.5% (50.2-54.8%) to 29.0% (26.5-31.6%) for haemorrhagic stroke.
Conclusions: Out-of-hospital fatal cases accounted for approximately 1 in 5 strokes in Mongolia. This high frequency had a significant impact on true incidence and case fatality, especially for haemorrhagic stroke.
Disclosure of interest: No

O072/1583

Scientific Communication SC12 - Epidemiology (including gender and sex topics)

CHANGES IN DEMOGRAPHICS AND THERAPIES IN PATIENTS WITH ATRIAL FIBRILLATION ASSOCIATED STROKE OVER 9 YEARS FROM THE IRISH NATIONAL AUDIT OF STROKE

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Background and aims: To characterise the changing demographics of AF associated stroke in Ireland and review changes in anticoagulation practice from 2013 to 2021 and how this impacted stroke admissions.
Methods: Data was collected from inpatient stroke admissions as part of the Irish National Audit of Stroke from 2013 to 2021.
Results: 34,630 patients with stroke were identified, 29,974(86.6%) of which were ischaemic. The proportion of strokes aged >80years over the 9-year period reduced from 36.2% to 33.3% (8% relative-reduction). While the 17-64years age-group increased from 24% to 26.78% (11.6% relative-increase). This was statistically significant (ChiSq 9.8, P=0.002).
The proportion of ischaemic strokes with atrial fibrillation(AF) reduced from 31.3% in 2013 to 26.5% in 2021 (15.3% relative-reduction). In 2013, 70% of ischaemic strokes with known AF prior to admission were on an antithrombotic, compared with 83% in 2021(18.6% relative-increase). The proportion of stroke patients (ischaemic and haemorrhagic) with known AF at admission on anticoagulation increased from 39.7% to 76.8% (93.5% relative-increase).
In 2013, 6.7% of patients admitted with known AF were taking a Direct Oral Anticoagulant (DOAC) and 33% warfarin. A dramatic change was seen in 2021, 67.3% were taking a DOAC and 9.4% warfarin.
Conclusions: The observed change in demographics from 2013 to 2021 may be related to the overall increase in anticoagulant usage given there was a decrease in AF prevalence in ischaemic strokes. The great majority of ischaemic and haemorrhagic stroke patients admitted with AF are now already receiving anticoagulation on presentation.
Disclosure of interest: No

O073/1879

Scientific Communication SC12 - Epidemiology (including gender and sex topics)

RISK OF RECURRENT STROKE IN THE GENERAL POPULATION - THE ROTTERDAM STUDY

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Background and aims: Several advances in the prevention of recurrent stroke have been introduced in the past few decades. However, recent

estimates on the risk of recurrent stroke from a Western population-based study are scarce. We therefore describe the risk of recurrent stroke in a population-based cohort study.

Methods: Study participants who developed a first-ever stroke during follow-up between 1990 and 2020 were selected and further monitored for the occurrence of a recurrent stroke. We calculated cumulative incidences of first recurrent stroke to assess recurrence risk. To reflect changing secondary preventive strategies employed in recent decades, we then stratified the risk of recurrent stroke within ten-year epochs based on first-ever stroke date (1990-2000, 2000-2010 and 2010-2020).

Results: In total, 1671 patients (mean age 80.3 years, 60.2% women) from 14165 stroke-free participants suffered a first-ever stroke between 1990 and 2020. Of these strokes, 1084 (64.9%) were ischemic, 138 (8.3%) hemorrhagic, and 449 (26.9%) undetermined. During 6494.5 person-years of follow-up, 331 (19.8%) suffered a recurrent stroke, of which 177 (53.5%) were ischemic, 34 (10.3%) hemorrhagic and 120 (36.3%) undetermined. Median time between first and recurrent stroke was 1.9 (interquartile range 0.5-4.7) years. The risk of recurrent stroke declined over time, with a ten-year risk of 21.4% (17.9%-24.9%) between 1990 and 2000 and 11.5% (8.6%-14.4%) between 2010 and 2020.

Conclusions: In this population-based study, over one in five people with first-ever stroke suffered a recurrent stroke. Furthermore, recurrence risk declined in the past 15 years, possibly due to improvements in secondary prevention.

Table 1 – Event and censoring information of study population (N=1671).

Time period	N At risk period start	N Recurrent strokes during period	N Deaths during period	N Other censoring during period	Total follow-up time at period end*	Incidence Rate of recurrent stroke within period	Cumulative Incidence of recurrent stroke at the end of period
0 – 1 year	1671	116	512	18	1163·7	65·0	6·9%
1 – 2 year	1025	53	112	20	2092·7	56·0	10·1%
2 – 3 year	840	34	93	19	2861·1	45·6	12·1%
3 – 4 year	694	32	57	19	3501·2	50·0	14·1%
4 – 5 year	587	22	66	15	4036·2	41·1	15·4%
5 – 6 year	483	20	49	19	4472·0	45·9	16·6%
6 – 7 year	395	11	42	14	4830·1	30·7	17·2%
7 – 8 year	328	6	35	10	5125·0	20·0	17·6%
8 – 9 year	277	5	29	5	5384·7	19·3	17·9%
9 – 10 year	238	7	32	7	5599·2	32·6	18·3%

*Person-years of follow-up from first-ever stroke until end of time period.

Figure 1 – Overview of the stroke subtype distribution at the first-ever and subsequent recurrence in n=331 participants with recurrent stroke, the central pie denotes the first-ever stroke subtype and the outer donut denotes the corresponding recurrent stroke subtype.

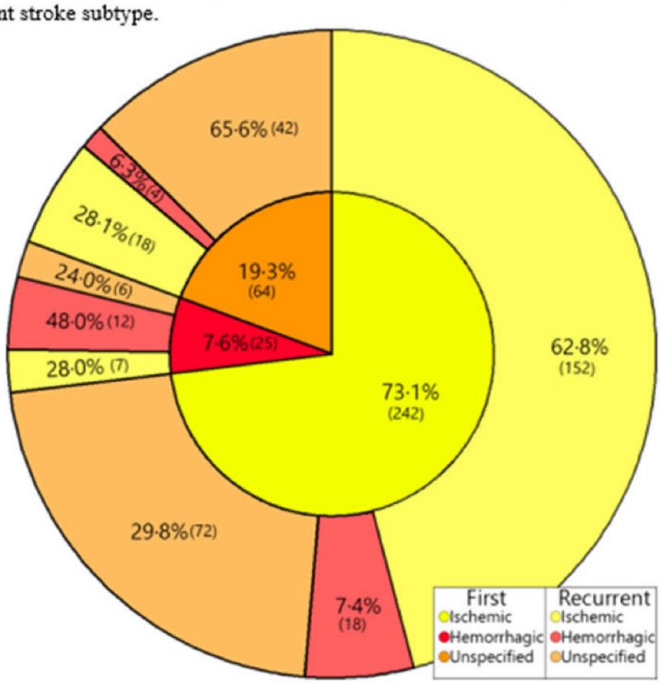


Figure 2 – Plot of overall risk of recurrent stroke over time following first-ever stroke, grey area denotes 95% confidence interval for proportions.

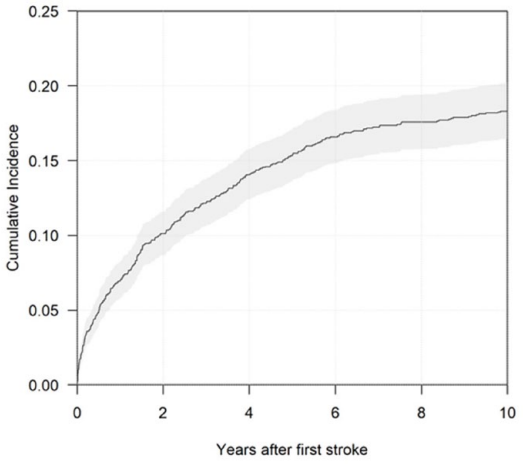
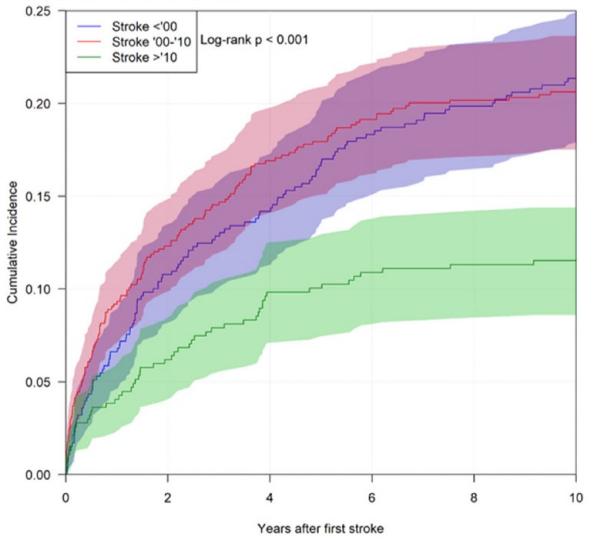


Figure 3 - Plots of risk of recurrent stroke over time, stratified for epoch where first-ever stroke occurred, coloured areas denote 95% confidence interval for proportions.



Disclosure of interest: No

O074/1820

Scientific Communication SC12 - Epidemiology (including gender and sex topics)

SEX DIFFERENCES IN MULTIMORBIDITY ASSOCIATED WITH ACUTE STROKE: RESULTS FROM THE UK BIOBANK

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Background and aims: Stroke affects women and men differently, but the influence of multimorbidity (multiple chronic conditions in an individual) on outcomes in stroke is uncertain. We explored sex differences in frequency of multimorbid conditions in individuals with stroke, and sex differences in outcomes (30-day and 1-year all-cause mortality and recurrent stroke) associated with multimorbidity.

Methods: UK Biobank is a large-scale prospective population-based cohort study of 500,000+ women and men recruited between 2006 and 2010, aged 40 to 69 years. Participants with a stroke were identified via linkage with hospital inpatient data (available between 1995-2021). Hospital episodes that occurred prior to stroke were extracted, to identify pre-specified multimorbid conditions and their associations with outcomes were modelled in logistic regression models.

Results: Of 12,994 UK Biobank participants (42% women) with a stroke diagnosis over 26-years, the most common conditions were: hypertension (60% of women vs 66% of men), atrial fibrillation (AF) (21% vs 28%), ischaemic heart disease (IHD) (19% vs 30%), and diabetes mellitus (17% vs 24%).

Crude 1-year mortality as odds ratio (95% confidence interval) for AF was 1.13(0.94-1.36) in women and 1.32(1.14-1.52) in men, and 1.00(0.83-1.21) and 1.18(1.01-1.36) with age-adjustment. For IHD corresponding ORs (95%CI) were 1.00(0.82-1.21) in women and 1.24(1.07-1.43) in men, and 0.93(0.76-1.14) and 1.15(0.99-1.33) with age-adjustment.

Conclusions: Differences were observed in the most common multimorbid conditions in women and men prior to stroke. Of the common conditions, only AF conferred a higher risk of death after adjustment for age, in men but not women.

Disclosure of interest: No

O075/937

Scientific Communication SC13 - Imaging

DEEP LEARNING BASED AUTOMATED DETECTION OF INTRACRANIAL HAEMORRHAGE USING 53,045 KOREAN POPULATION

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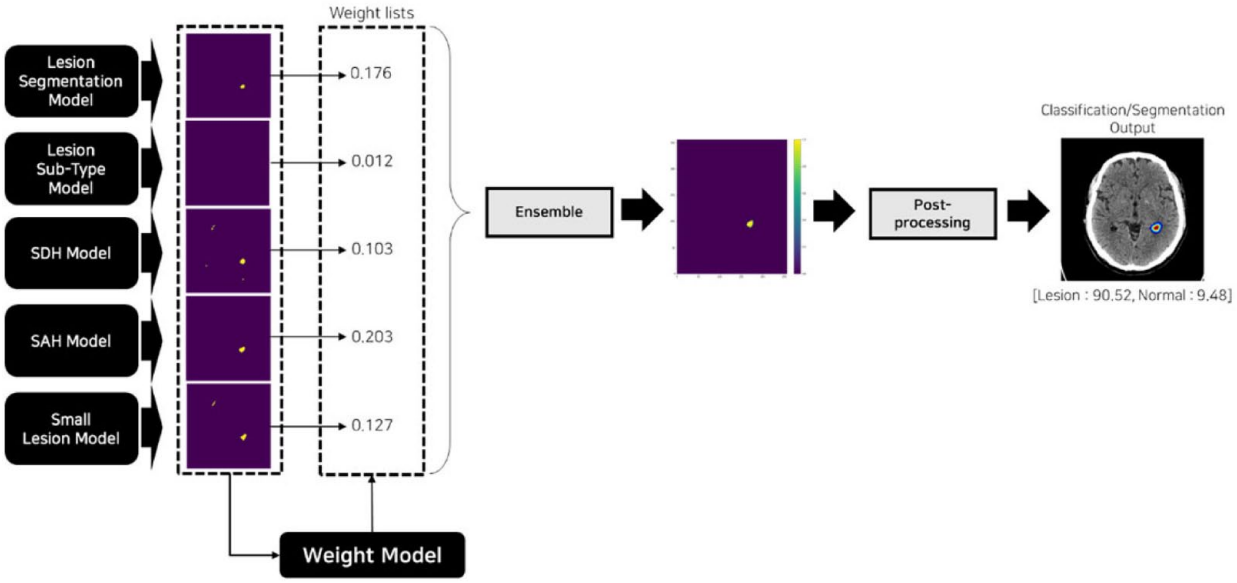
Background and aims: The performance of a deep learning algorithm is significantly dependent on the quality of the training data that comprises accurate disease labeling and a richness of information. We tested whether adding regional information to deep learning algorithms trained on large public brain CT datasets from North America (RSNA) and Korea (AI-HUB) improved their performance. We also developed the best weighted ensemble model utilizing Korean data.

Methods: RSNA dataset comprises CT from three hospitals (7,499 haemorrhage and 11,439 normal) and subtypes per slice. AI-Hub dataset includes the presence, subtype, and annotated location of haemorrhage in each slice from 6 hospitals (7,013 haemorrhage and 46,032 normal). Four neural networks trained on randomly selected 6,000 haemorrhage and 6,000 normal slices from each database to compare quality. For the best deep learning approach, we trained five networks for different purpose (lesion-segmentation, subtype, subdural, subarachnoid, and minor intracranial hemorrhage) and ensembled their output (Figure).

Results: In four networks, AI-HUB models outperformed RSNA models (all $p<0.05$; average-AUC-difference 0.030). Adding regional information improved deep learning performance (average-AUC-difference=0.059). External validation demonstrated strong sensitivity(0.966) and specificity(0.815) for the best ensemble model (AUC 0.965). For each haemorrhage subtype, sensitivity and specificity were 0.961 and 0.815 for intracerebral/intraventricular, 0.937 and 0.793 for subdural/epidural, and 0.95 and 0.88 for subarachnoid.

Conclusions: Deep learning models based on AI-HUB dataset outperformed those trained on RNSA dataset, indicating better data quality. Regional bleeding information also improved deep learning. Our best



algorithm performed well in external validation for all haemorrhagic subtypes.
Disclosure of interest: No

O076/2562

Scientific Communication SC13 - Imaging

INFARCT CORE VOLUME ESTIMATION ON NON-CONTRAST COMPUTED TOMOGRAPHY USING A MACHINE LEARNING ALGORITHM SOFTWARE

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Background and aims: A simplified patient selection paradigm can reduce time to reperfusion and widen the eligibility of large vessel occlusions (LVO) for endovascular therapy (EVT). We developed and validated a machine learning (ML) algorithm to estimate infarct core volume (ICV) on non-contrast computed tomography (NCCT) in anterior circulation LVO patients
Methods: LVO patients were identified using prospectively maintained databases at stroke centers in US and Spain. Consecutive patients who underwent NCCT and CT perfusion at admission, had post-EVT diffusion-weighted imaging (DWI-MRI) within 24 hours, and successful reperfusion (mTICI ⩾2b) were included. Final infarct volume (FIV) was measured on DWI-MRI by 2 independent neuro-radiologists. ML algorithm was trained to identify ICV from NCCT, against DWI-MRI. Pearson correlations and confusion matrices were used for comparing agreement between NCCT ICV algorithm, NCCT ASPECT and CT perfusion (CTP) Rapid volume (CBF <30%), with DWI-MRI volumes
Results: The ML algorithm was developed and trained using a cohort of 2856 stroke activations and validated in an independent cohort of 185 patients. ML ICV algorithm correlation (r= 0.53) was similar to CTP (r=0.56, p=0.36) and significantly superior to NCCT ASPECTS (r=0.39, p=0.05). Sensitivity analysis including TICI 2c/3 patients showed that ML ICV correlation increase to r=0.61. ML algorithm had 98% (84/85) concordance with the CTP based DEFUSE 3 eligibility criteria
Conclusions: ML algorithm can reliably estimate ischemic core volume using NCCT with similar accuracy to CTP and superior to NCCT ASPECT, and may represent an alternate simplified selection modality for the treatment of LVO patients
Disclosure of interest: No

O077/2465

Scientific Communication SC13 - Imaging

PERIVASCULAR SPACES IN THE BRAIN ENLARGE OVER TIME: A THREE-YEAR LONGITUDINAL STUDY

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Background and aims: Perivascular spaces in the brain can become enlarged (ePVS); their temporal dynamics remain under increasing debate. We studied automatic ePVS measurements obtained from 870 subjects along the AD continuum over the course of three years.

Table 1. Descriptive statistics for fractional CSO-ePVS and BG-ePVS volumes for four annual visits, stratified by clinical groups. We corrected estimates for age at the time of the scan. We did not observe sufficient evidence suggesting fractional ePVS volumes to vary over clinical groups.

	Baseline demographics				Baseline Fractional volume (%)		12-month follow-up Fractional volume (%)		24-month follow-up Fractional volume (%)		36-month follow-up Fractional volume (%)	
Clinical group	N	Females (%)	Age (years)	Education (years)	CSO-ePVS	BG-ePVS	CSO-ePVS	BG-ePVS	CSO-ePVS	BG-ePVS	CSO-ePVS	BG-ePVS
Normal controls	214	58.41	69.41±5.37	14.69±2.76	0.20±0.04	0.50±0.02	0.24±0.06	0.52±0.02	0.24±0.05	0.50±0.02	0.41±0.09	0.57±0.03
Subjective cognitive decline	353	46.74	70.99±6.16	14.96±2.97	0.21±0.03	0.50±0.02	0.27±0.05	0.53±0.02	0.27±0.04	0.55±0.02	0.50±0.08	0.59±0.02
Mild cognitive impairment	142	46.47	72.92±5.78	13.87±3.07	0.25±0.05	0.48±0.03	0.40±0.07	0.53±0.03	0.34±0.07	0.56±0.04	0.67±0.15	0.57±0.04
Alzheimer's disease	88	57.95	74.50±6.26	12.93±3.27	0.65±0.06	0.61±0.03	0.63±0.10	0.57±0.04	0.62±0.10	0.63±0.05	1.35±0.27	0.63±0.08
Alzheimer's disease relative	73	58.90	66.06±4.51	14.49±2.71	0.28±0.07	0.50±0.04	0.27±0.10	0.50±0.04	0.29±0.09	0.52±0.05	0.56±0.18	0.58±0.05

Table 2. Fractional ePVS volumes over follow-ups. Linear mixed effect modelling (uncorrelated random slope and intercept) indicates CSO- and BG-ePVS increase over time (CSO: B=0.02 [95%-CI 0.00-0.04], p<0.031; BG: B=0.04 [95%-CI 0.03-0.05], p<0.001). The age of the patient at baseline determines the initial volume of ePVS in the BG (B=0.13 [95%-CI 0.09-0.17], p<0.001), but not in the CSO-ePVS (p=0.245). WMH progression coincides with PVS enlargement (BG: B=0.05 [95%-CI 0.04-0.07], p<0.001; CSO: B=0.19 [95%-CI 0.15-0.22], p<0.001). Unfortunately, so does the presence of motion artefacts in the images—here quantified in terms of the background signal (CSO: B=0.22 [95%-CI 0.13-0.31], p<0.001; BG: B=0.03 [95%-CI -0.00-0.07], p=0.059).

	Fractional CSO-ePVS volume			Fractional BG-ePVS volume		
Predictors	B	CI	p-value	B	CI	p-value
(Intercept)	-2.27	-2.40 – -2.14	**<0.001**	-0.74	-0.81 – -0.67	**<0.001**
Age	-0.05	-0.13 – 0.03	0.245	0.13	0.09 – 0.17	**<0.001**
Time	0.02	0.00 – 0.04	**0.031**	0.04	0.03 – 0.05	**<0.001**
Sex	-0.25	-0.40 – -0.11	**0.001**	-0.01	-0.09 – 0.06	0.721
Education years	0.05	-0.02 – 0.12	0.174	-0.02	-0.06 – 0.01	0.206
Background intensity	0.22	0.13 – 0.31	**<0.001**	0.03	-0.00 – 0.07	0.059
age^2				-0.04	-0.08 – -0.01	**0.020**
CSO-WMH	0.19	0.15 – 0.22	**<0.001**			
BG-WMH				0.05	0.04 – 0.07	**<0.001**
Random effects						
σ^2	0.18			0.02		
τ_{00}	0.80 $_{subject}$			0.21 $_{subject}$		
τ_{11}	0.01 $_{subject.time\_ind}$			0.00 $_{subject.time\_ind}$		
ICC	0.82			0.90		
N	692 $_{subject}$			682 $_{subject}$		
Observations	2157			2154		
Marginal R^2 / Conditional R^2	0.132 / 0.841			0.138 / 0.915		

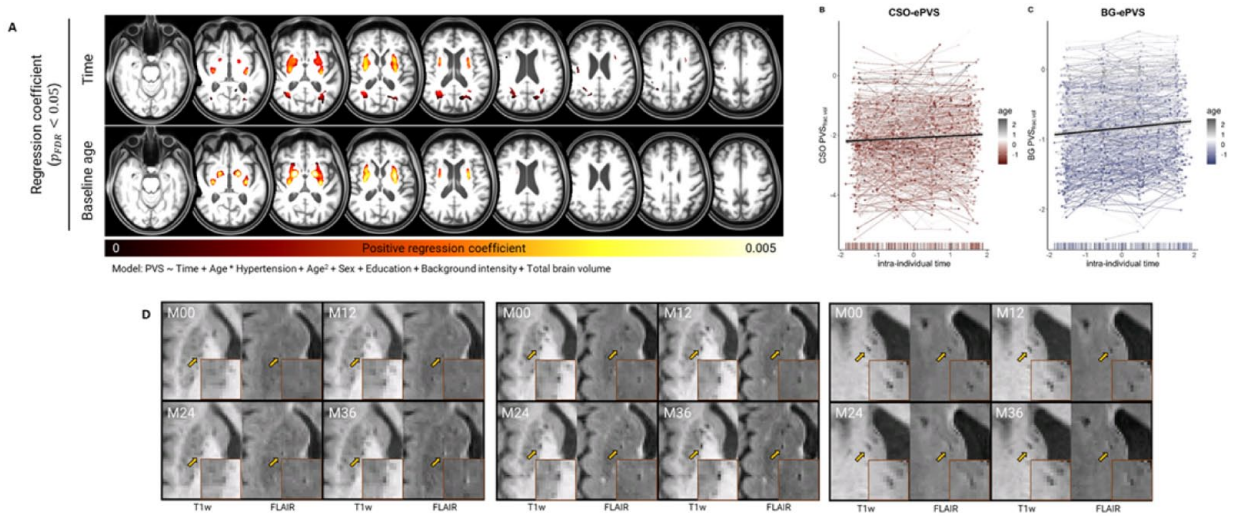

*Figure 1. **ePVS trajectories over longitudinal follow-ups.** (A) PVS become enlarged over time, especially around lenticulostriate arteries (peak: putamen, xyz_{MNI} = [29, -5, 10], B = 0.04, z = 9.13, p_{FDR} < 0.001) and parietal blood vessels radiating out and posteriorly from the lateral ventricles (peak: parietal lobe, xyz_{MNI} = [27, -56, 29], B = 0.02, z = 6.58, p_{FDR}< 0.001). (B-C) Fractional ePVS volumes ($ePVS_{volume}/ROI_{volume} \cdot 100$) increased over follow-ups in both CSO and BG (CSO: B=0.02 [95%-CI 0.00-0.04], p<0.031; BG: B=0.04 [95%-CI 0.03-0.05], p<0.001), with initial BG-ePVS volumes—not CSO-ePVS—being determined by the age of the patient at the baseline visit (B=0.13 [95%-CI 0.09-0.17], p<0.001). (D) Within a three-year period, WMH may emerge in the vicinity of ePVS.*

Methods: We measured centrum semiovale (CSO) and basal ganglia (BG) ePVS volumes computationally in the multicentre DZNE Longitudinal Cognitive Impairment and Dementia Study (DELCODE) (**Table 1**; 870 subjects; 51% female, mean age 70.85 (SD 6.16), max. 4 annual time points; 2487 sets of T1w and FLAIR). We segmented ePVS using a multi-scale Hessian-based filtering method leveraging T1w and FLAIR imaging and validated segmentation against clinical visual ratings. We studied local longitudinal changes via the sandwich estimator toolbox and linear mixed-effect modelling and tested for effects of age, hypertension, clinical diagnosis, ApoE4 status, pTau181, and Aβ42/40 on ePVS trajectories.

Results: BG-ePVS and CSO-ePVS became more voluminous over time (**Table 2** and **Figure 1A-C**; BG: *B*=0.04 [*95%-CI* 0.03-0.05], $p<0.001$; CSO: *B*=0.02 [95%-CI 0.00-0.04], $p<0.031$).

The age of the patient at baseline determined the baseline volume of ePVS in the BG (B=0.13 [95%-CI 0.09-0.17], $p<0.001$), but not in the CSO-ePVS (p=0.245).

WMH can form around ePVS (**Figure 1D**) and their progression was correlated with PVS enlargement (BG: *B*=0.05 [*95%-CI* 0.04-0.07], $p<0.001$; CSO: *B*=0.19 [*95%-CI* 0.15-0.22], $p<0.001$).

No other predictors contributed significantly to longitudinal ePVS changes.

Conclusions: Ageing is a major contributor to the volumetric expansion of ePVS over time. WMH and ePVS growth are associated, suggesting shared underlying pathological mechanisms

Disclosure of interest: No

O079/1285

Scientific Communication SC13 - Imaging

BRAIN STRUCTURAL DETERMINANTS OF LATE-LIFE FUNCTIONALITY

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Background and aims: Vascular brain injury in cerebral small vessel disease contributes to progressing structural, metabolic and functional brain changes leading to accelerated brain aging and reduced cognitive and physical performance. We investigated the determinants of a deleterious brain aging phenotype based on associations between microvascular structural brain injury and physio-cognitive capacity in two population-based cohorts.

Methods: We analyzed clinical and neuroimaging data from the UK Biobank (UKB, N=42,194) and Hamburg City Health Study (HCHS, N=2,537). Motor and cognitive functioning were acquired conducting multi-domain test batteries. Vascular structural brain changes were characterized via white matter hyperintensity (WMH) load, peak width of skeletonized mean diffusivity (PSMD) and relative brain age (RBA). Partial least squares correlation (PLS) was performed to identify a common covariance pattern relating motor and cognitive test scores with imaging markers.

Results: PLS identified a significant latent variable explaining 98% of shared variance (Fig.1a). The covariance profiles indicate that decreased motor and cognitive performance (Fig.1b) were significantly associated with increased WMH load, PSMD and RBA (Fig.1c). Linear regression supported the PLS findings (Fig.2).

Conclusions: Being based on a large-scale, multi-modal imaging analysis, our results highlight vascular structural brain changes as a key determinant of physio-cognitive performance in later life. Furthermore, our findings indicate that this relationship is of low-dimensional nature.

Disclosure of interest: No

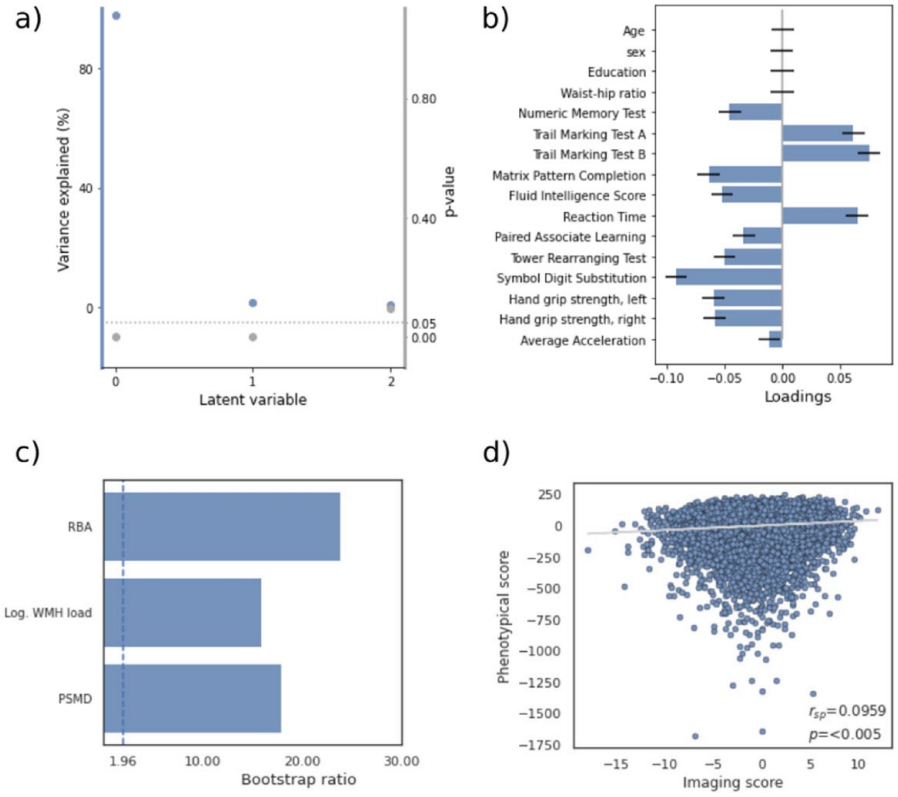

Fig 1. PLS results in the UKB.

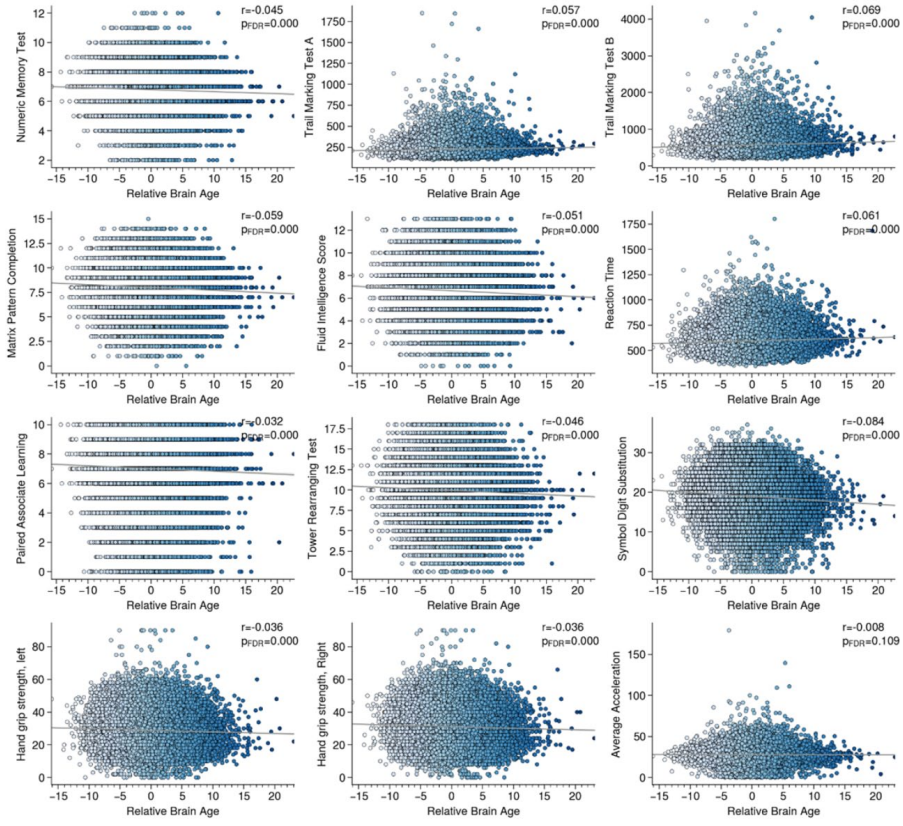

Fig. 2. Linear regression results between relative brain age and clinical markers in the UKB.

O080/1599

Scientific Communication SC13 - Imaging

ASSOCIATION BETWEEN PERFUSION METRICS AND POOR CLINICAL OUTCOME DESPITE SUCCESSFUL RECANALIZATION IN THE ESCAPE-NA1 TRIAL

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Background and aims: Although recanalization is associated with improved outcomes in acute ischemic stroke patients, many still do poorly. We sought to investigate associations between computed tomography perfusion (CTP) metrics in patients with successful recanalization and functional dependence at 90 days.

Methods: Data are from the ESCAPE-NA1 trial. Admission CTP source data were processed using RAPID software, generating Time-to-Maximum (Tmax), relative cerebral-blood-flow (rCBF) and cerebral-blood-volume (CBV) volume maps at standard thresholds. Associations between each perfusion metric and poor clinical outcome (90-day modified Rankin score [mRS] 3-6) were tested using multivariable logistic regression, adjusted for baseline imaging and clinical variables. Predictive accuracy of models with and without perfusion features were compared via area under the curve (AUC) analysis.

Results: 413 patients underwent CTP, of which 186 were successfully recanalized (modified Thrombolysis In Cerebral Infarction [mTICI] 2c-3). Of these, 54 (29%) were mRS 3-6 at 90 days. Those with poor outcomes had significantly higher volumes across all rCBF and CBV volume thresholds (e.g., CBV<42% 6mL [IQR:0-28] vs. 22mL [IQR:6-67], p<0.001). Tmax>4s was the only threshold with significantly higher volumes. In adjusted analyses, the strongest significant association for each perfusion variable type was Tmax>10s (OR1.13 95%CI[1.02-1.25]), rCBF<20% (OR1.28 95%CI[1.07-1.54]) and CBV<42% (OR1.13 95%CI[1.03-1.24]), all per 10cc. Predictive accuracy of the adjusted model improved from 0.87 AUC to 0.90 AUC (p=0.03) with the addition of perfusion variables.

Conclusions: Although predictive accuracy of poor clinical outcome improves with the addition of CTP metrics, clinical utility versus practicality should be considered on a per-patient basis.

Disclosure of interest: No

O081/62

Scientific Communication SC13 - Imaging

APICAL PULMONARY LESIONS SUSPECTED OF MALIGNANCY VISIBLE ON NECK CT ANGIOGRAPHY PERFORMED FOR ACUTE STROKE: PREVALENCE, TREATMENT AND CLINICAL IMPLICATIONS – THE PLEURA STUDY

Tolga Dittrich[1], Mara Aujesky[1], Salome Rudin[1], Annaelle Zietz[1], Benjamin Wagner[1], Alexandros Polymeris[1], Valerian Altersberger[1], Tim Sinnecker[1], Henrik Gensicke[1,2], Stefan Engelter[1,2], Philippe Lyrer[1], Viviane Hess[3], Raoul Christian Sutter[4], Christian Nickel[5], Leo Bonati[1,6], Urs Fischer[1], Marios Psychogios[7], Mira Katan[1], Gian Marco De Marchis*[1]

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Background and aims: Computed tomography angiography (CTA) of the supraaortic arteries is commonly used for acute stroke workup and may reveal incidental apical pulmonary lesions (APL). We aimed to determine the prevalence, follow-up algorithms, and in-hospital outcomes of stroke patients with APL on CTA.

Methods: We retrospectively included consecutive adult patients with ischemic stroke, transient ischemic attack, or intracerebral hemorrhage and available CTA at a tertiary hospital between January 2014 and May 2021. We reviewed all CTA reports for the presence of APL. APL were classified as malignancy-suspicious or benign-appearing based on radiological-morphological criteria. We performed regression analyses to investigate the impact of malignancy suspicious APL on different in-hospital outcome parameters.

Results: Among 2,715 patients, APL on CTA were found in 161 patients (5.9% [95%CI: 5.1-6.9]; 161/2,715). Suspicion of malignancy was present in one third of patients with APL (36.0% [95%CI: 29.0-43.7]; 58/161), 42 of whom (72.4% [95%CI: 60.0-82.2]; 42/58) had no history of lung cancer or metastases. When performed, further investigations confirmed primary or secondary pulmonary malignancy in three-quarters (75.0% [95%CI: 50.5-89.8]; 12/16), with two patients (16.7% [95%CI: 4.7-44.8]; 2/12) receiving de novo oncologic therapy. In multivariable regression, the presence of radiologically malignancy-suspicious APL was associated with higher NIHSS scores at 24 hours (beta: 0.53, 95%CI: 0.16-0.89, p=0.01) and all-cause in-hospital mortality (aOR: 2.87, 95%CI: 1.10-6.64, p=0.02).

Conclusions: One in seventeen patients shows incidental APL on CTA, of which one-third is malignancy suspicious. Further work-up confirmed pulmonary malignancy in a substantial number of patients triggering potentially life-saving oncologic therapy.

Figure 1. Study flow chart

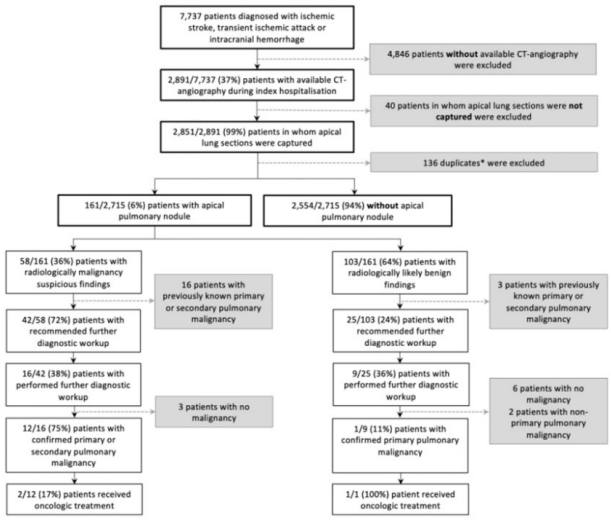
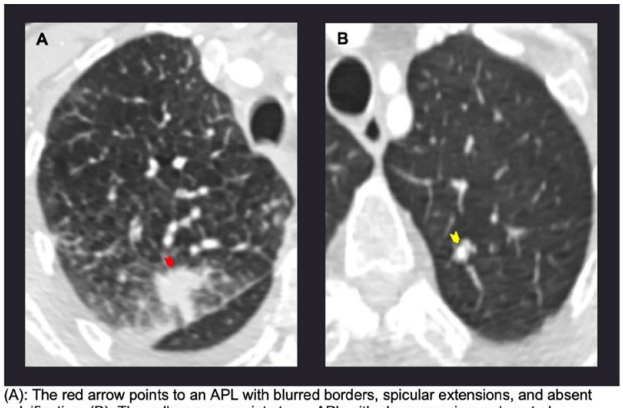


Figure 2: Example of APL classified as malignancy suspicious (A) and APL classified as probable benign (B).



(A): The red arrow points to an APL with blurred borders, spicular extensions, and absent calcification. (B): The yellow arrow points to an APL with sharp margins and central calcification.

Table 1. Baseline characteristics of patients with captured apical pulmonary segments on computed tomography angiography.

		Patients with APL		
	Patients without APL (N=2,554)	Likely benign (N=103)	Malignancy suspicious (N=58)	P value
Demographics				
Age (yr) – median [IQR]	76 [66, 84]	80 [73, 85]	78 [68, 84]	**0.048**
Female sex – no. (%)	1132 (44)	52 (51)	24 (41)	0.34
Medical history§ – no. (%)				
Previous ischemic stroke or TIA	499 (20)	16 (16)	8 (14)	0.95
Previous ICH	62 (3)	0	1 (2)	0.77
Atrial fibrillation	646 (27)	33 (32)	19 (33)	1.00
Diabetes mellitus	517 (21)	28 (27)	10 (17)	0.22
Hypertension	1845 (76)	83 (81)	44 (76)	0.62
Known cancer				
Pulmonary (primary or metastases)	31 (1)	3 (3)	15 (26)	**<0.001**
Extrapulmonary (primary)	184 (7)	19 (18)	21 (36)	**0.02**
Prior deep vein thrombosis	145 (6)	7 (7)	11 (19)	**0.04**
Smoking history	417 (17)	17 (17)	18 (31)	0.05
COPD	144 (6)	5 (5)	7 (12)	0.17
Clinical characteristics at admission#				
Admission diagnosis – no. (%)				
Ischemic stroke or TIA	2399 (94)	98 (95)	54 (93)	0.85
Intracranial hemorrhage	155 (6.1)	5 (5)	4 (7)	0.85
NIHSS score at admission – median [IQR]	5.0 [2.0, 12.0]	5.0 [2.0, 11.0]	9.5 [4.0, 15.8]	**0.03**
Premorbid mRS score – median [IQR]	0 [0, 1.0]	0 [0, 1.0]	0 [0, 1.0]	0.71
Stroke onset known – no. (%)				
Yes	1757 (69)	67 (65)	39 (68)	0.80
No				0.17
On awakening	329 (13)	21 (20)	6 (11)	
Unwitnessed during wakefulness	468 (18)	15 (15)	13 (21)	
Imaging parameters				
Diameter of pulmonary lesion (mm) – median [IQR]	—	2.0 [1.0, 2.0]	3.0 [2.3, 3.0]	**<0.001**
Emphysema – no. (%)	—	13 (13)	12 (21)	0.26
Inflammatory infiltrate – no. (%)	—	2 (2)	3 (5)	0.51
Laboratory parameters at admission& – median [IQR]				
Blood glucose at admission	6.6 [5.8, 8.1]	6.6 [5.7, 8.4]	7.1 [6.0, 8.7]	0.25
INR at admission	1.1 [1.0, 1.1]	1.1 [1.0, 1.1]	1.1 [1.0, 1.3]	0.08
First CRP after admission	2.8 [1.2, 7.2]	3.0 [1.4, 9.7]	8.1 [3.1, 34.3]	**<0.001**
First d-dimer after admission	0.94 [0.4, 2.4]	1.2 [0.4, 2.1]	4.6 [0.8, 20.0]	0.11
Treatment characteristics¥				
Treatment with intravenous tPA – no. (%)	1140 (45)	43 (42)	20 (35)	0.46
Endovascular treatment – no. (%)	496 (20)	15 (15)	15 (26)	0.12

APL: apical pulmonary lesions; IQR: interquartile range

§ TIA denotes transient ischemic attack; ICH intracranial hemorrhage; COPD chronic obstructive pulmonary disease.
& INR denotes international normalized ratio; LDL low-density lipoprotein; CRP c-reactive protein.
# NIHSS denotes National Institutes of Health Stroke Scale (ranging from 0 to 42 points); mRS modified Rankin Scale.
¥ tPA denotes intravenous tissue-type plasminogen activator.

Table 2. Oncological diagnosis and treatment of patients with confirmed pulmonary malignancy

Case	Age at diagnosis	Oncological diagnosis			Oncological treatment
		Final diagnosis	TNM*-staging	UICC# stage	
1	78	NSCLC&	cT3 cN2 cM0	III	Refused by patient
2	85	NSCLC	cT1 cN0 cM0	I	Refused by patient
3	79	NSCLC	cT1 cN0 cM0	I	Refused by patient
4	94	NSCLC	cT3 cN2 cM0	III	Best supportive care
5	84	NSCLC (adenocarcinoma)	pT1 pN0 cM0	I	Surgical resection
6	83	NSCLC	cT1 cN2 cM0	III	Refused by patient
7	69	NSCLC	cT1 Nx Mx	N.A.	Deceased during hospitalisation
8	85	NSCLC	cT3 cN2 cM0	III	Refused by patient
9	58	NSCLC	cT1 cN0 cM0	I	Refused by patient
10	88	Renal cell carcinoma with pulmonary metastasis	-	-	Palliative care setting
11	70	NSCLC (adenocarcinoma)	pT2 cN2 cM1	IV	Palliative care setting
12	72	NSCLC	cT2 cN2 cM0	III	Surgical resection

* TNM: Tumor-Nodal-Metastasis staging
# UICC: Union for International Cancer Control
& NSCLC: non-small-cell lung cancer

Disclosure of interest: No

O082/787

Scientific Communication SC14 - Atherosclerosis and Stroke

BACKGROUND ARTERIAL INFLAMMATION IMAGED BY POSITRON EMISSION TOMOGRAPHY AND LATE OUTCOME VASCULAR RECURRENCE AFTER STROKE

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Background and aims: Atherosclerosis is a systemic inflammatory disease. Anti-inflammatory therapies reduce major adverse cardiovascular events (MACE) in coronary disease but are unproven after stroke. ^{18}F-fluorodeoxyglucose-positron-emission-tomography (^{18}FDG-PET) quantifies plaque inflammation and predicts ipsilateral stroke recurrence in symptomatic carotid stenosis. It is unknown if background vascular inflammation imaged by ^{18}FDG-PET predicts late-outcome vascular recurrence in other arterial beds.

Methods: We pooled individual-participant-data from three prospective studies with near-identical methods. Patients had recent non-severe (Rankin ⩽3) ischaemic stroke/TIA, ipsilateral carotid stenosis (30-99%), and underwent carotid ^{18}FDG-PET/CT angiography ⩽14 days after recruitment. Background arterial inflammation was identified as ^{18}FDG-uptake in the contralateral asymptomatic internal carotid artery. The whole-vessel average of each maximum standardized uptake value (WV-SUV_{max}) measured over fifteen arterial slices (1mm), defined relative to the carotid bifurcation, was the primary exposure variable. The co-primary endpoints were 3-year recurrent ischemic stroke and MACE.

Results: Of 194 patients, 20 had recurrent stroke and 34 experienced MACE (cumulative follow-up 481 years). On crude analysis, WV-SUV_{max} in the asymptomatic carotid artery was associated with 3-year recurrent ischemic stroke (HR 2.60, 95% CI 1.05-6.40, p=0.04, per 1g/mL), with a trend for MACE (HR 1.90, 95% CI 0.94-3.81, p=0.07). After adjustment for sex, carotid revascularization, stenosis severity, and hypertension; WV-SUV_{max} was associated with recurrent stroke (HR 3.90. 95 % CI, 1.42-10.69, p=0.008) and MACE (HR 2.24, 95% CI 1.07-4.71, p=0.03).

Conclusions: Background vascular inflammation imaged by ^{18}FDG-PET is independently associated with late-outcome vascular recurrence after large-artery stroke. Randomised trials of anti-inflammatory therapies after stroke are needed.

Disclosure of interest: No

O083/460

Scientific Communication SC14 - Atherosclerosis and Stroke

IS PERIODONTITIS ASSOCIATED WITH STROKE? THE UNITED STATES NATIONAL HEALTH AND NUTRITION EXAMINATION SURVEY 2009 -2014

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Background and aims: Periodontitis is considered as a risk factor for cardiovascular diseases and atherosclerosis. However, the relationship between periodontitis and stroke is rarely studied. Therefore, we aimed to explore the relationship between periodontitis and stroke.
Methods: We analysed data on 6,460 participants aged 30 years or older, who had valid data on periodontitis and stroke from the National Health and Nutrition Examination Survey (NHANES) 2009 to 2014. Statistical analysis was performed using the complex sampling design.
Results: 39.9% of participants had periodontitis and 2.1% of participants had a record of stroke diagnosis. Stroke was associated with severity levels of periodontitis (p for trend=0.018). The odds ratio for stroke was significantly elevated in the moderate and severe periodontitis participants compared to participants without periodontitis (OR for moderate periodontitis: 1.71, 95% CI: 1.17-2.50; OR for severe periodontitis: 2.55. 95%: 1.25-5.21). After adjusting for race/ethnicity and sex, the association remained significant (p for trend=0.009). After further adjusting for BMI, hypercholesterolaemia, diabetes, alcohol consumption and physical activity, the association still existed (p for trend=0.027). The association was significant consistently after further adjusting for age (p for trend=0.033).
Conclusions: Periodontitis is associated with stroke. The risk of stroke with moderate periodontitis and severe periodontitis is 1.71 times and 2.55 times as high as that without periodontitis. Dental health management may be of benefit to stroke prevention.
Disclosure of interest: No

O084/1932

Scientific Communication SC14 - Atherosclerosis and Stroke

CAROTID GEOMETRY IS ASSOCIATED WITH COMPLICATED CAROTID ARTERY PLAQUES

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Background and aims: Complicated carotid artery plaques (cCAP) are associated with an increased risk of rupture and subsequent stroke. Geometry of the carotid bifurcation determines the distribution of local wall shear and plaque stress and could thus contribute to the development of these plaques. Therefore, we studied the role of carotid bifurcation geometry on the presence of cCAP.
Methods: 354 carotid arteries from 182 patients from the Carotid Plaque Imaging in Acute Stroke (CAPIAS) study were analyzed. Individual parameters of carotid geometry (i.e., internal carotid artery [ICA]/common carotid artery [CCA]-ratio, bifurcation angle and tortuosity) were derived from time-of-flight MR images. The lesion types of carotid artery plaques were determined according to the American Heart Association lesion type classification by multi-contrast 3T-MRI. Association of carotid geometry and cCAP was studied using logistic regression adjusting for age, sex, wall area and cardiovascular risk factors.
Results: Low ICA/CCA-ratio (OR per SD increase 0.60 [95%-CI: 0.42-0.85]; p=0.004) and low bifurcation angle (OR 0.61 [95%-CI: 0.42-0.90]; p=0.012) were significantly associated with presence of cCAP after adjustment for age, sex, cardiovascular risk factors and wall area. Only ICA/CCA-ratio remained significant in a model containing all three geometric parameters (OR per SD increase 0.65 [95%-CI: 0.45-0.94]; p=0.023).
Conclusions: A steep tapering of the ICA relative to the CCA and, to a lesser extent, a low angle of the carotid bifurcation were associated with presence of cCAP. Our findings highlight the contribution of bifurcation geometry to plaque vulnerability.
Disclosure of interest: No

O085/190

Scientific Communication SC14 - Atherosclerosis and Stroke

INDIVIDUALIZED MRI-BASED PLAQUE RISK SCORE FOR (RECURRENT) STROKE IN SYMPTOMATIC PATIENTS WITH CAROTID ARTERY DISEASE (IMPACT)

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Background and aims: In symptomatic patients with carotid stenosis, (recurrent) stroke risk estimations are currently primarily based on the degree of stenosis and sex. Intraplaque hemorrhage (IPH) on carotid MRI is a strong and independent predictor for ipsilateral stroke, stronger than any clinical risk factor. We developed a novel clinical prediction model (IMPACT) incorporating MRI-based scoring of IPH.

Methods: We pooled data from 6 cohort studies with patients (n=801) with a recent (<6 months) TIA or minor stroke and a carotid plaque (>2 mm). A Cox proportional hazards model was developed and internally validated using bootstrapping. The performance of the IMPACT score was compared to a Care As Usual (CAU) scenario based on degree of stenosis, sex, and the time since last event.

Results: The IMPACT model includes 6 predictors: age, sex, time since last event, classification of last event, degree of stenosis, and presence of IPH on MRI (Figure 1). Discrimination of the IMPACT score was good (C-statistic: 0.81; 95% CI: 0.78–0.87) after internal validation. The sensitivity of the IMPACT score was much higher than CAU (78%; 95% CI: 71-83% versus 66%; 95%CI: 64-71%), while maintaining a similar specificity (68%; 95% CI: 65-71% versus 68%; 95% CI: 64-71%). Discrimination of high-risk individuals is improved when using the IMPACT score versus the CAU (Figure 2).

Conclusions: We demonstrate excellent predictive capability with the IMPACT score using only 6 parameters. The IMPACT score outperforms CAU when it comes to identifying individuals at risk of a recurrent stroke.

Disclosure of interest: No

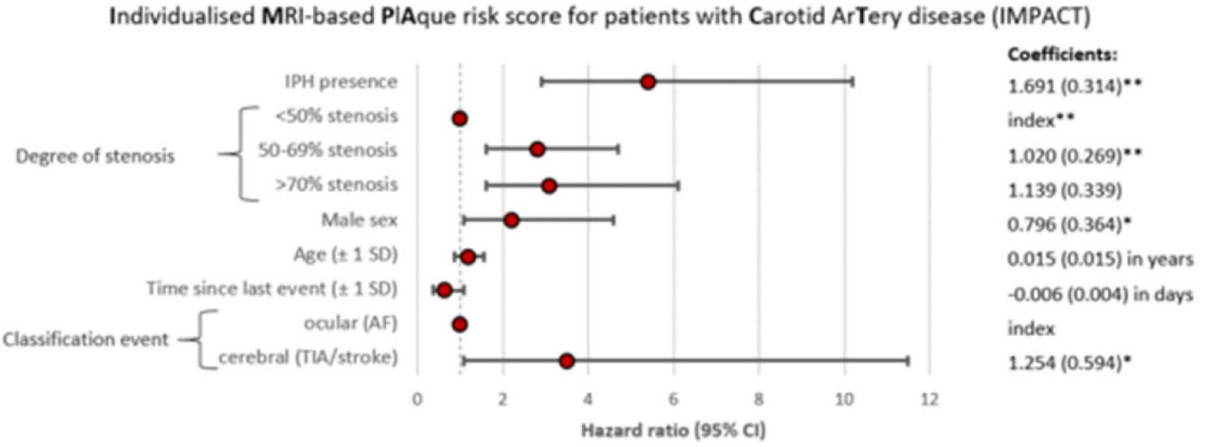

Fig. 1. Hazard ratio's of the model's parameters are presented with 95% confidence interval. Coefficients are presented including standard error. IPH= Intraplaque hemorrhage. AF= Amaurosis Fugax. TIA= Transient Ischemic Attack. *p-value of variable <0.05. ** p-value of variable <0.001.

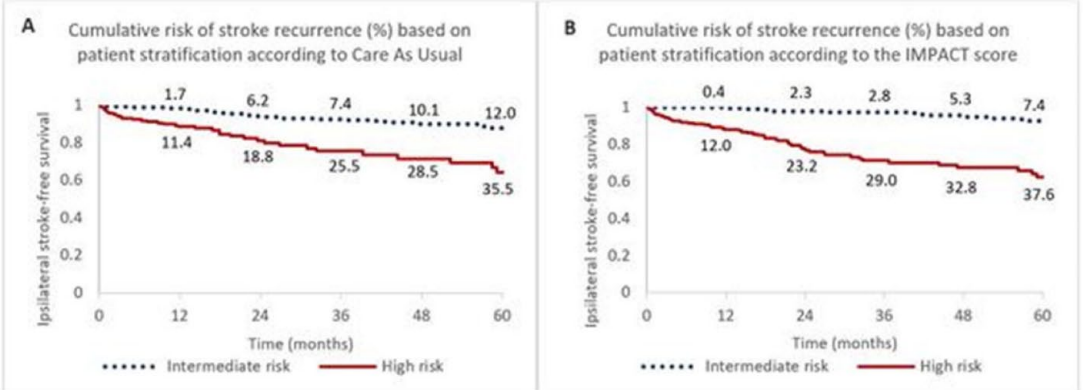

Fig. 2. For Care As Usual, patients were considered as high risk and eligible for carotid revascularization when they had a high degree of stenosis (male patients > 50%, female patients >70%).
For the IMPACT score, patients were categorized at high risk when the 2-year ipsilateral stroke risk based on the IMPACT score was over 23%. The remaining patients were categorized at intermediate risk.

O086/464

Scientific Communication SC14 - Atherosclerosis and Stroke

REMODELLING AND STROKE RELAPSE IN SYMPTOMATIC INTRACRANIAL ATHEROSCLEROTIC DISEASE: A LONGITUDINAL 3D ROTATIONAL ANGIOGRAPHY STUDY

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Background and aims: To depict remodeling of intracranial plaques (ICAD) and investigate if morphometric feature might predict stroke relapse or plaque progression.
Methods: We prospectively recruited patients within 4 weeks from strokes attributed to a 60-99% ICAD stenosis in 3-dimensional rotational angiography (3DRA). All patients had guideline-based medical therapy and risk factors monitored in 1, 3, 6 and 12 months. Follow-up 3DRA was performed at one year or strokes relapse. Primary outcome was 'progressive ICAD', defined as: 1) relevant ischemic stroke or transient ischemic attack (TIA) relapse in the first year; or 2) plaque progression (i.e., >10% increase in luminal stenosis or new ulceration) in follow-up 3DRA.
Results: Among 90 ICAD patients (median age 61 years), 25 (27.8%) had primary outcome. Among the 17 patients (18.9%) who had ischemic stroke/TIA relapse, 15 occurred within 4 months from the index event (IQR 1- 4 months). Yet, none of these 17 patients had plaque progression found at stroke relapse. By 12 months, 8 patients (8.9%) had plaque progression without stroke/TIA relapse. Higher plaque thickness (adjusted OR=8.94; p=0.001 with 5,000 bootstrap samples), smaller angulation at upstream shoulder (0.97; 0.037) and maximum stenotic severity at the distal plaque end (3.89; 0.007) independently predicted the primary outcome. A derivative 3-factor model was highly associated with the primary outcome (c-statistic 0.774). Patients with or without 'progressive ICAD' had comparable intensity of risk factor control.
Conclusions: Plaque thickness, upstream angulation and skewed plaque load to the distal end were associated with ICAD stroke recurrence and plaque progression.
Disclosure of interest: No

O087/1327

Scientific Communication SC14 - Atherosclerosis and Stroke

STROKE INDUCES EARLY RECURRENT VASCULAR EVENTS BY INFLAMMASOME-DEPENDENT ATHEROSCLEROTIC PLAQUE RUPTURE

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Background and aims: Patients with large artery atherosclerosis have the highest risk of recurrent event after stroke onset. However, the mechanism of how stroke leads to atherosclerotic plaque rupture and ischemia is largely unknown.
Methods: Rupture-prone plaques were induced by tandem stenosis ligation (TS) of the RCCA in HFD-fed *ApoE*$^{-/-}$ mice. 4 weeks after TS, transient left MCA occlusion was conducted. Secondary brain lesions were detected by MRI scan and confirmed by histology. Morphological features of plaque and vascular inflammation were studied using histology, western blot and FACS. For investigating the inflammasome impact, caspase-1, AIM2 and NLRP3 inhibitors were administered systemically.
Results: Stroke leads to activation of the AIM2 inflammasome in vulnerable atherosclerotic plaques via an increase of circulating cell-free DNA from the ischemic tissue. Enhanced morphological changes (more plaque macrophages and necrotic cores, less collagen) and plaque inflammation (elevated caspase-1 expression) post-stroke results in plaque destabilization, finally leading to arterio-arterial embolism and recurrent stroke within days after the index stroke. We confirm key steps of plaque destabilization also after experimental myocardial infarction and in carotid artery plaque samples from patients with acute stroke. Neutralization of cell-free DNA by DNase treatment or inhibition of inflammasome activation reduced the rate of stroke recurrence after experimental stroke.
Conclusions: Here we provide for the first time a mechanistic explanation for high recurrence rate in atherosclerotic stroke. Stroke leads to exacerbated plaque inflammation and rupture by activation of the inflammasome. Inhibition of inflammasome could be a novel and potent therapy for preventing recurrent ischemic events.
Disclosure of interest: No

O088/1000

Scientific Communication SC14 - Atherosclerosis and Stroke

CAROTID PLAQUE SCORE FOR CARDIOVASCULAR RISK PREDICTION IN A MIDDLE-AGED COHORT FROM THE GENERAL POPULATION: THE AKERSHUS CARDIAC EXAMINATION 1950 STUDY

Håkon Ihle-Hansen*[1,2], Thea Vigen[3,4], Trygve Berge[1], Marte Walle-Hansen[1], Guri Hagberg[1,5], Hege Ihle-Hansen[1,5], Bente Thommessen[3,4], Inger Ariansen[6], Helge Røsjø[3,7], Ole Morten Ronning[3,4,7], Arnljot Tveit[1,7], Magnus Nakrem Lyngbakken[3,7]
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Background and aims: We aimed to explore the predictive value of the carotid plaque score compared to the Systematic COronary Risk Evaluation (SCORE) 2 risk prediction algorithm, on stroke and major adverse cardiovascular events (MACE), as well as establish a prognostic cut-off for the carotid plaque score.
Methods: In the prospective Akershus Cardiac Examination 1950 birth cohort study, carotid plaque score was calculated at inclusion, 2012-2015. The largest plaque diameter in each extracranial segment of the carotid artery both sides was scored from 0-3 points. The sum of each segment provided the plaque score. The cohort was follow by linkage to national registries for stroke and MACE (nonfatal stroke, nonfatal myocardial infarction, and cardiovascular death) throughout 2020.

Results: Carotid plaque score was available in 3650 (98.5%) of the participants, with mean age at inclusion 63.9±0.64 years. Only 462 (12.7%) were free of plaque and the median plaque score was 2 (IQR 3). By the end of 2020, 42 (1.2%) subjects had experienced a stroke, and 145 (4.0%) a MACE. Carotid plaque score predicted stroke (HR 1.25, 95%CI 1.15-1.36) and MACE (OR 1.21, 95%CI 1.14-1.27) after adjustment for SCORE2, and outperformed SCORE2 in predicting stroke (p=0.001). The best cut-off value for plaque score determined by receiver operator characteristics area under the curve was ⩾4 with a PPV 3.1% and NPV 99.0%.
Conclusions: Carotid plaque score is a strong predictor of stroke and MACE and outperforms SCORE2. A cut-off score of ⩾4 seems to be suitable to discriminate high-risk subjects.
Disclosure of interest: No

O089/2252

Scientific Communication SC15 - Small Vessel Disease

POPULATION RISK FACTOR FOR SMALL VESSEL DISEASE OR HIGHLY PENETRANT MONOGENIC STROKE AND VASCULAR DEMENTIA: GENETIC RISK STRATIFICATION IN NOTCH3-ASSOCIATED SMALL VESSEL DISEASE

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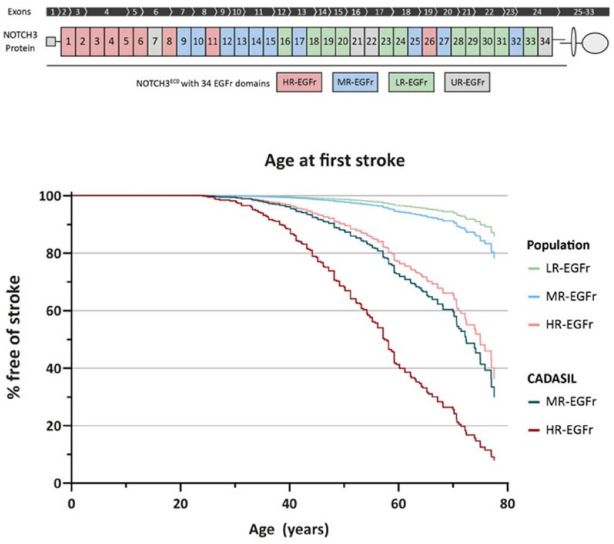
Background and aims: Pathogenic *NOTCH3* variants have a population frequency of 1 in 300, affecting millions of people worldwide. The phenotype associated with pathogenic *NOTCH3* variants ranges from early onset strokes and vascular dementia (CADASIL), to a much milder late onset small vessel disease. Here, we aimed to improve genetic risk stratification in *NOTCH3* small vessel disease.
Methods: Individuals with *NOTCH3* pathogenic variants were ascertained from multiple CADASIL cohorts (total n=2574) and population databases (total n=1647). Based on the relative difference in *NOTCH3* variant frequency between CADASIL cohorts and the population, variants were classified as high, medium or low risk (HR, MR and LR). Small vessel disease neuroimaging markers (Peak Width of Skeletonized Mean Diffusivity, normalized white matter hyperintensity volume, lacune volume) and clinical outcomes (stroke and disability) were compared between the genetic risk categories using multiple linear, logistic and Cox regression models including cardiovascular risk factors.
Results: Genetic risk category was significantly associated with all neuroimaging and clinical outcome measures and was the most important disease modifier, followed by hypertension and male sex. HR-individuals had a 10-fold higher stroke risk than LR-individuals (95%CI:5.46 – 21.37). Community dwelling individuals with HR-variants had a similar stroke risk as individuals from CADASIL pedigrees with MR-variants.
Conclusions: Stratification of *NOTCH3* variants into high medium and low risk leads to improved individualized disease prediction in individuals in whom a *NOTCH3* pathogenic variant is identified, either in a CADASIL- familial setting or as chance finding in diagnostic whole exome sequencing.



Disclosure of interest: No

O090/2301

Scientific Communication SC15 - Small Vessel Disease

VASCULAR NOTCH3 AGGREGATION IN SKIN AS AN EARLY BIOMARKER FOR NOTCH3-SMALL VESSEL DISEASE: ASSOCIATION WITH GENETIC RISK CATEGORY AND WHITE MATTER MICROSTRUCTURAL DAMAGE

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Background and aims: NOTCH3-small vessel disease (NOTCH3-SVD) is a cerebral microvascular aggregopathy caused by *NOTCH3*-cysteine altering variants, with CADASIL at the severe end of the spectrum. NOTCH3-SVD severity is primarily driven by *NOTCH3* variant position classified as high-, medium- or low risk (HR, MR, LR) for developing severe disease. The focus of pre-clinical therapy development is reducing the rate of NOTCH3 aggregation. Clinical trials can benefit from biologically relevant biomarkers for analyzing target engagement. Here, we aim to investigate whether NOTCH3 aggregation load in skin vessels is associated with relevant neuroimaging outcomes.
Methods: Skin biopsies were taken from 176 NOTCH3-SVD patients enrolled in DiViNAS, a prospective cohort study. The NOTCH3 score was calculated by dividing the area with positive NOTCH3 immunostaining by the total vascular surface area. Multiple linear regression was used to investigate the relationship between NOTCH3 score, variant position and MRI markers (normalized White Matter Hyperintensity Volume (nWMHv); normalized Lacune Volume (nLV); Peak Width of the Skeletonized Mean Diffusivity (PSMD)), after correction for age, sex and cardiovascular risk factors.

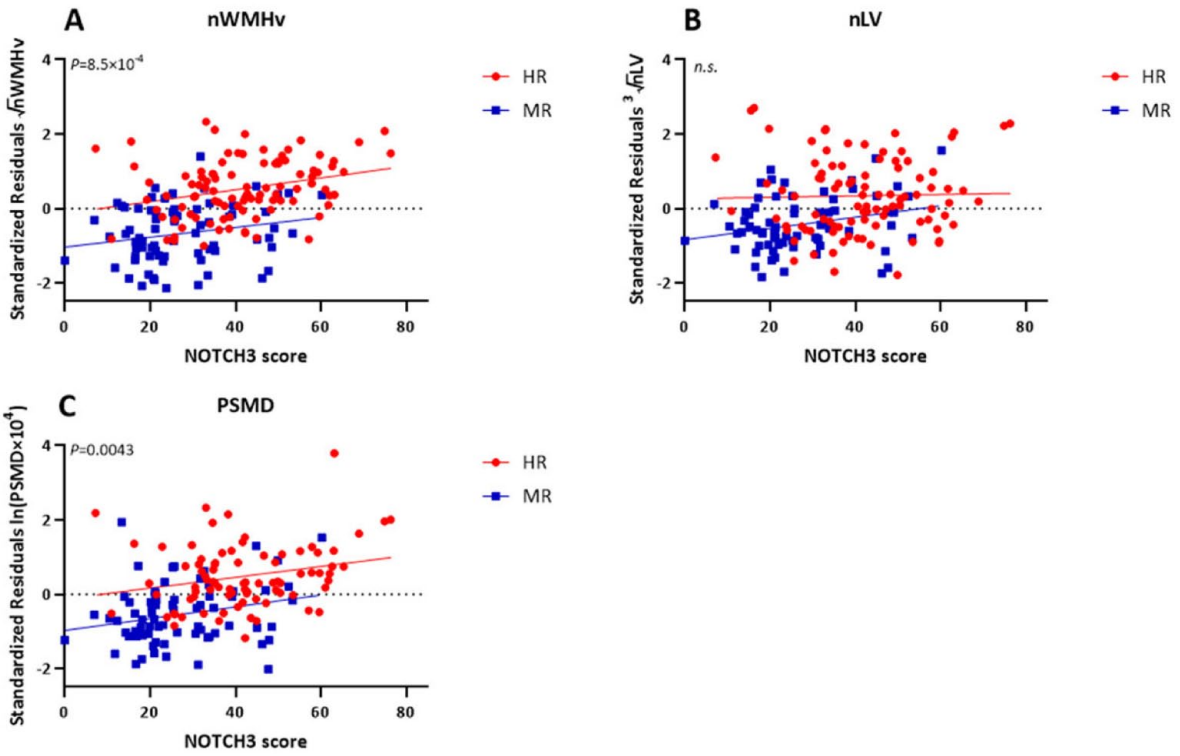

Figure 1. Correlation per genetic risk category between NOTCH3 score and neuroimaging markers nWMHv (**A**), nLV (**B**) and PSMD (**C**), after correction for age, sex and cardiovascular risk factors.

Results: The mean NOTCH3 score was higher in patients with HR variants (n=99) than MR variants (n=77) ($P=1.2\times10^{-9}$). Higher NOTCH3 scores were associated with higher nWMHv ($P=5.1\times10^{-11}$), nLV ($P=3.1\times10^{-4}$) and PSMD ($P=6.0\times10^{-9}$). After stratifying for genetic risk category, NOTCH3 score was associated with nWMHv ($P=8.5\times10^{-4}$) and PSMD ($P=0.0043$), but not with nLV.
Conclusions: Higher NOTCH3 aggregation load in skin vessels is associated with a higher burden of MRI SVD markers, including PSMD, even after correction for genetic risk category.
Disclosure of interest: No

O091/1897

Scientific Communication SC15 - Small Vessel Disease

WHITE MATTER HYPERINTENSITIES ARE ASSOCIATED WITH CEREBRAL PULSATILITY WHICH REFLECTED VASCULAR AGING, IN CONTRAST TO IMPAIRED CEREBROVASCULAR REACTIVITY REFLECTING DISEASE SEVERITY: OxHARP TRIAL BASELINE RESULTS

Alastair Webb*[1], Osian Llywd[1], Catriona Stewart[1], James Thomas[1], Karolina Wartolowska[1]
[1]*University of Oxford, Wolfson Centre for Prevention of Stroke and Dementia, Department of Clinical Neurosciences, Oxford, United Kingdom*

Background and aims: OxHARP is testing effects of phosphodiesterase inhibition on cerebral pulsatility (gPI) and cerebrovascular reactivity (CVR) in patients with mild-moderate white matter hyperintensities (WMH). We determined potential pathophysiological differences between gPI and CVR through baseline associations with WMH.
Methods: OxHARP (NCT03855332) was a double-blind, randomised, placebo-controlled, crossover trial of phosphodiesterase inhibitors in patients with mild-moderate WMH (Fazekas $\leq$4) and lacunar or cryptogenic TIA/stroke. Middle cerebral artery TCD endpoints included Gosling's pulsatility index (gPI) and mean velocity change to inhaled 6% CO2 (CVR). WMH were classified as mild, moderate or moderately severe (Fazekas/modified Blennow scores), and by WMH-volume in the MRI-substudy (BIANCA-FSL). Associations were determined by linear and ordinal regression, with or without adjustment for age and gender.
Results: In 75/75 patients at randomisation (median 70 years, 79% male), WMH-severity was associated with gPI (p=0.006) and reduced CVR (p=0.03). gPI was strongly associated with age (r^2=0.46, p$<$0.001), arterial stiffness (r^2=0.05, p=0.03) and aortic pulse pressure (r^2=0.22, p$<$0.001), with no association with WMH after adjustment for age and gender (p=0.28). In contrast, CVR was not associated with age (p=0.23) or stiffness (p=0.18), but remained associated with WMH after adjustment (p=0.02). In 57 patients, unadjusted WMH-volume was associated with gPI (p=0.012) and CVR (p=0.016).
Conclusions: Whilst WMH are associated with pulsatility and reactivity, gPI reflected vascular aging whilst CVR only reflected disease severity, implying different systemic versus local physiological mechanisms in WMH. However, the direction of causation can only be assessed through randomised treatment effects.
Funding: Wellcome CRCDF:206589_Z_17_Z

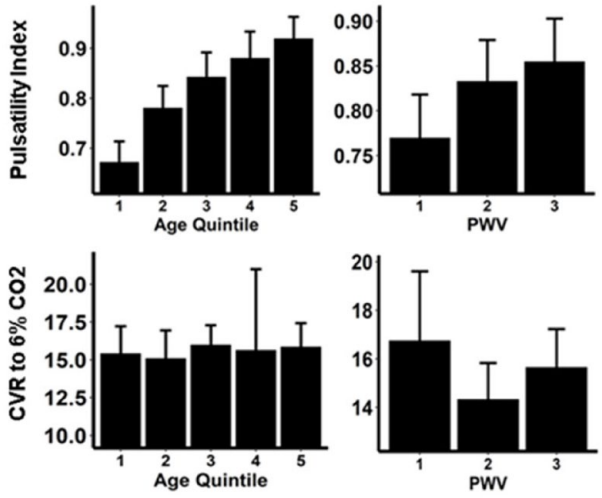

Figure 1. Associations between gPI and CVR with age and arterial stiffness (PWV)

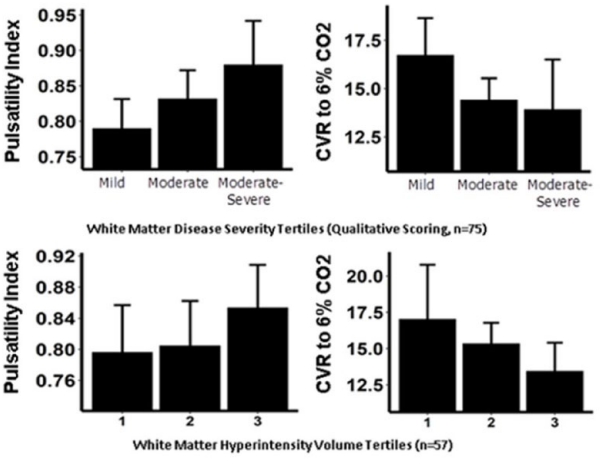

Figure 2. Associations between severity of white matter hyperintensities and gPI or CVR by qualitative categories and WMH-volume.

Disclosure of interest: No

O092/671

Scientific Communication SC15 - Small Vessel Disease

REGIONAL CORTICAL THINNING, DEMYELINATION, AND IRON LOSS RELATED TO WHITE MATTER HYPERINTENSITIES IN CEREBRAL SMALL VESSEL DISEASE

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Background and aims: To determine the association between white matter hyperintensities (WMH) and cortical thickness, and the tissue composition changes in the WMH-connected cortical regions in small vessel disease (SVD).

Methods: We included 213 SVD participants (median age 73 years, 44.6% women) who underwent multimodal neuroimaging scans and cognitive assessment (i.e., processing speed, executive function, and memory). We identified the WMH-connected cortical regions using probabilistic tractography starting from WMH at three connectivity levels (low, medium, and high, Figure 1). We calculated the cortical thickness, myelin and iron using T1-weighted, quantitative R1, R2*, and susceptibility maps. We used diffusion-weighted imaging to estimate the mean diffusivity (MD) of the connecting white matter tracts.

Results: We found that cortical thickness, R1, R2* and susceptibility values in the WMH-connected regions were significantly lower than in the WMH-unconnected regions (p-corrected$<$0.001); higher MD of the connecting white matter tracts were related to lower thickness, R1, R2* and susceptibility values of WMH-connected cortical regions at high connectivity level (p-corrected$\leq$0.001, Figure 2); slower processing speed were related to lower cortical thickness, R1, R2*, and susceptibility values of the WMH-connected regions at high connectivity level (p-corrected$<$0.050).

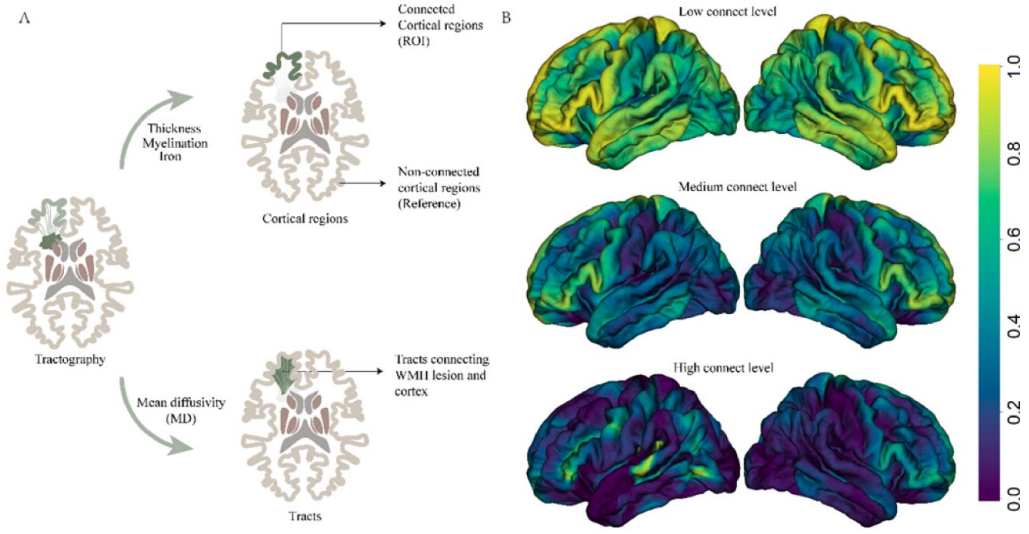
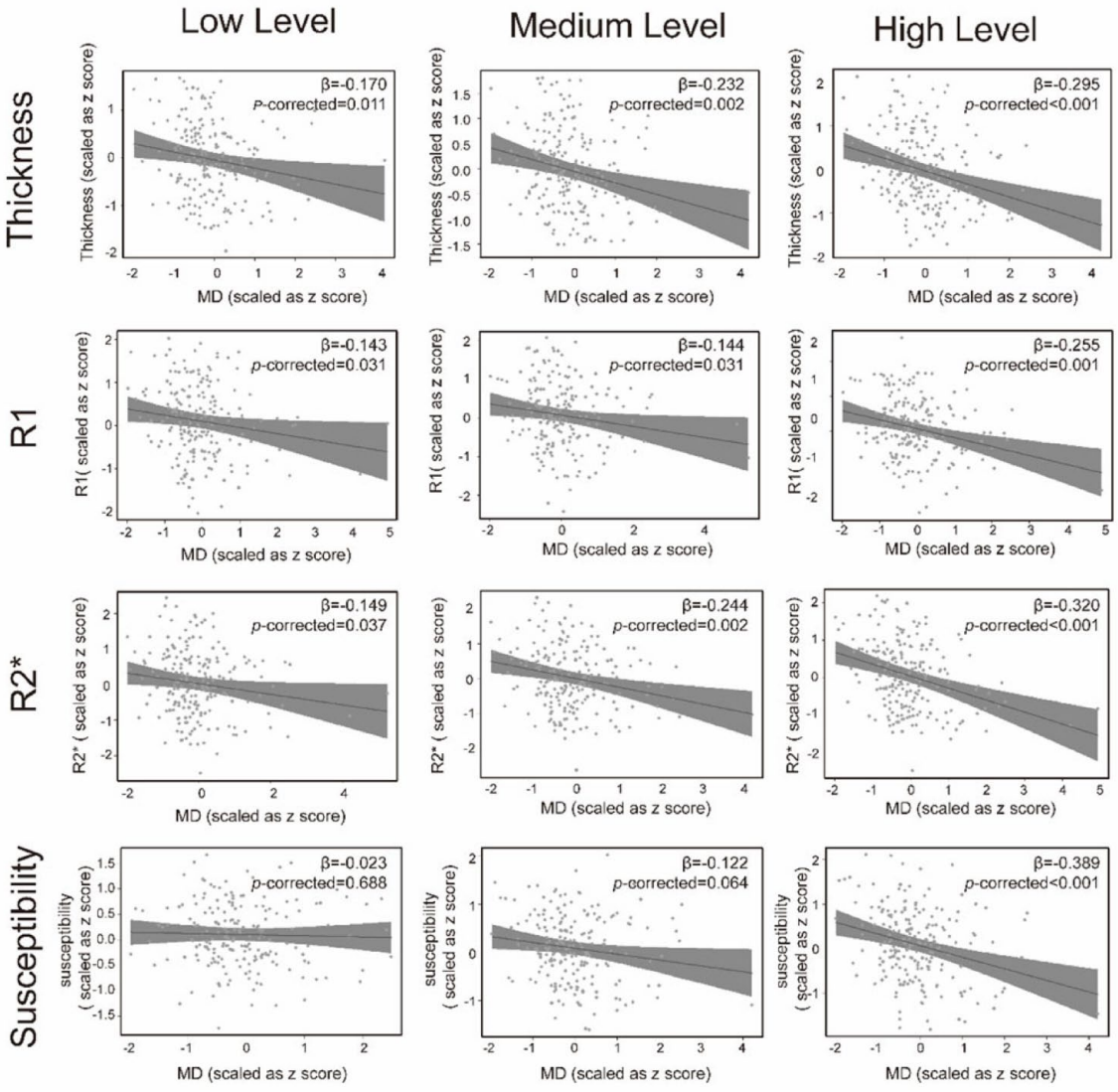


Figure 1. Study design and methods.



Conclusions: Damage of white matter tracts passing through WMH is related to regional cortical thinning, and tissue composition changes, mostly likely demyelination and iron loss, and these cortical changes contribute to processing speed dysfunction in SVD.
Disclosure of interest: No

O093/1425

Scientific Communication SC15 - Small Vessel Disease

VISIT-TO-VISIT BLOOD PRESSURE VARIABILITY AND PROGRESSION OF WHITE MATTER HYPERINTENSITIES OVER 14 YEARS

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Background and aims: There is evidence that blood pressure variability (BPV) is associated with cerebral small vessel disease (SVD) and may therefore increase the risk of stroke and dementia. It remains unclear if BPV is associated with SVD progression over years. We examined whether visit-to-visit BPV is associated with White Matter Hyperintensity (WMH) progression over 14 years and MRI markers after 14 years.
Methods: We included participants with SVD from the Radboud University Nijmegen Diffusion tensor Magnetic resonance imaging Cohort (RUNDMC) who underwent baseline assessment in 2006 and follow-up in 2011, 2015 and 2020. BPV was calculated as coefficient of variation of BP at all visits. Association between WMH progression rates over 14 years and BPV was examined using linear-mixed effects model. Regression models were used to examine association between BPV and MRI markers at final visit in participants.
Results: A total of 199 participants (60.5 SD 6.6 years) who underwent four MRI scans and blood pressure measurements were included, with mean follow-up of 13.7 (SD 0.5) years. Systolic BPV was associated with

higher progression of WMH (β=0.013, 95%CI 0.005–0.022) and higher risk of incident lacunes (OR:1.10, 95%CI 1.01-1.21). There was no association between systolic BPV and grey and white matter volumes, Peak Skeleton of Mean Diffusivity (PSMD) or microbleed count after 13.7 years.

Conclusions: Visit-to-visit systolic BPV is associated with increased progression of WMH volumes and higher risk of incident lacunes over 14 years in participants with SVD. Future studies are needed to examine causality of this association.

Disclosure of interest: No

O094/2616

Scientific Communication SC15 - Small Vessel Disease

LOW-FREQUENCY OSCILLATIONS DURING RESTING-STATE BOLD-MRI IDENTIFY DIFFERENTIAL CONTROL OF CEREBRAL BLOOD FLOW BY TISSUE TYPE IN SMALL VESSEL DISEASE: A UK BIOBANK ANALYSIS

James Thomas*[1], Alastair Webb[1], Peter Jezzard[2]

[1]*University of Oxford, Centre for Prevention of Stroke and Dementia, Oxford, United Kingdom*, [2]*University of Oxford, Wellcome Centre for Integrative Neuroimaging, Oxford, United Kingdom*

Background and aims: Progression of small vessel disease may be causally associated with endothelial dysfunction. Low-frequency oscillations (LFOs) in cerebral blood flow may provide a practical index of local and systemic endothelial function and autonomic control. We investigated differences in the frequency and tissue-specificity of LFOs in >40,000 rsMRI scans in UK Biobank by severity of white matter hyperintensities (WMH).

Methods: Resting-state BOLD-fMRI time series were motion-corrected, de-meaned, robustly normalised, segmented, and the power spectra derived (FSL). LFOs were measured as total amplitude (ALFF) from 0.05-0.1 Hz and 0.1-0.15 Hz (AFNI). WMH-load was the logarithm of WMH volume on FLAIR (FSL-BIANCA). Associations with WMH-load were determined by linear models, with and without adjustment for age, sex, and cardiovascular risk factors, with voxel-wise differences between high and low WMH-load quartiles in standard space (MNI152).

Results: In 41,380 participants (47% women; mean 55 years), LFO amplitudes at 0.1-0.15 Hz were greater in the highest versus lowest WMH quartile ($p<0.005$) in both white and grey matter and in large blood vessels (Figure 1). In contrast, LFOs in the 0.05-0.1 Hz range in grey matter were greater in the lowest WMH quartile ($p<0.005$). This was consistent with voxel-wise comparisons (Figure 2).

Conclusions: White matter LFOs were greater in patients with larger WMH-load, implying reduced compensation for fluctuations in systemic blood flow. However, in grey matter, LFOs below 0.1 Hz were significantly reduced, potentially reflecting local endothelial dysfunction affecting cerebral blood flow.

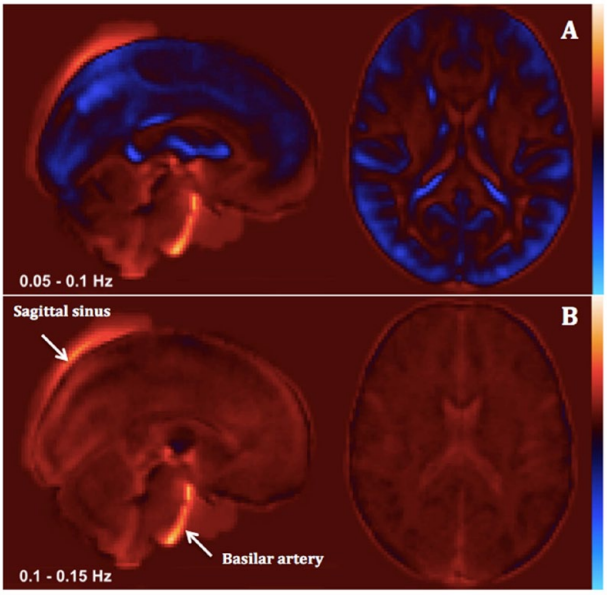

Figure 2
Amplitude of low-frequency fluctuation (ALFF) group mean spatial maps with high WMH group (Q4) signal > low WMH group (Q1) signal. Red spectrum represents higher ALFF values in Q4 and blue represents higher ALFF values in Q1. Upper pane (A), 0.05 – 0.1 Hz; lower pane (B), 0.1 – 0.15 Hz.

Disclosure of interest: No

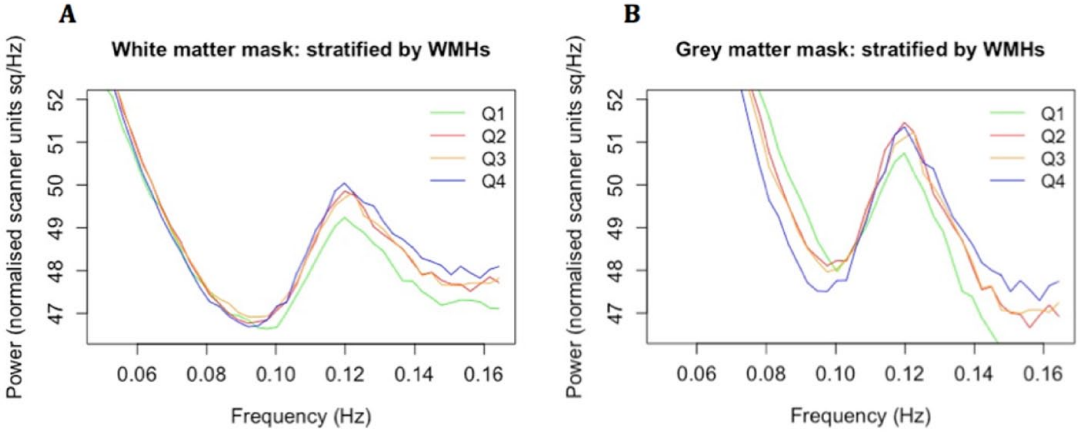

Figure 1
Group mean power spectral density for white matter mask (A) and grey matter mask (B) grouped by severity of white matter hyperintensity (WMH) load, where Q1 is the lowest and Q4 is the highest load.

O095/1304

Scientific Communication SC15 - Small Vessel Disease

ASSOCIATION BETWEEN ARTERIAL TORTUOSITY AND EARLY NEUROLOGICAL DETERIORATION IN LENTICULOSTRIATE ARTERY TERRITORY INFARCTION

BumJoon Kim*[1], Sang Hee Ha[2]

[1]*Asan Medical Center, Neurology, Seoul, South Korea*, [2]*Gachon University Gil Medical Center, Neurology, Incheon, South Korea*

Background and aims: Early neurological deterioration (END) in patients with lenticulostriate artery (LSA) infarction is associated with perforating artery hypoperfusion. As middle cerebral artery (MCA) tortuosity alters hemodynamics, we investigated the association between MCA tortuosity and END in patients with LSA infarction.

Methods: We reviewed patients with acute (< 7 d after stroke onset) LSA territory infarction, without significant stenosis. END was defined as an increase of ⩾2 or ⩾1 in the National Institutes of Health Stroke Scale (NIHSS) total or motor score, respectively, within the first 72 h. The MCA tortuosity index (actual length/straight length) was measured. Stroke mechanisms were categorized based on diffusion-weighted imaging lesions: branch atheromatous disease (BAD) and lipohyalinotic degeneration (LD), which were defined as lesions >10 mm and smaller lesions respectively.

Results: END occurred in 104/390 (26.7%) patients. A high MCA tortuosity index (adjusted odds ratio [aOR]=10.63, 95% confidence interval [CI] 2.565–44.079; p=0.001) was independently associated with END. In patients with BAD, a high initial NIHSS score (aOR = 1.40, 95% CI 1.032–1.886; p=0.031) and presence of parental artery disease (stenosis<50% diameter reduction; aOR=10.38, 95% CI 1.854–58.078; p=0.008) were independently associated with END. In patients with LD, high MCA tortuosity (aOR=41.78, 95% CI 7.369–237.04; p<0.001) was independently associated with END.

Conclusions: High MCA tortuosity might be associated with END in patients with LSA infarction, particularly in those with LD. The mechanism causing END in patients with LD and BAD may differ.

Disclosure of interest: No

O096/552

Scientific Communication SC15 - Small Vessel Disease

IMAGING NEUROVASCULAR, ENDOTHELIAL AND STRUCTURAL INTEGRITY IN PREPARATION TO TREAT SMALL VESSEL DISEASES (INVESTIGATE-SVDS):

ASSOCIATIONS BETWEEN PVS SCORE AND VASCULAR DYSFUNCTION METRICS

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Background and aims: Perivascular spaces (PVS) occur in small vessel disease (SVD) but their relation to SVD type, severity and vascular dysfunction is unknown. Sporadic SVD prevalence increases with age, while cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL) affects younger individuals. We assessed associations between PVS and vascular dysfunction metrics.

Methods: We recruited patients with sporadic SVD or CADASIL in 3 centres, acquired clinical data and 3T MRI to assess structural SVD markers, cerebrovascular reactivity (CVR), blood brain barrier (BBB) function and intracranial vascular pulsatility (https://harness-neuroimaging.org/investigate-svds). We analysed MRI centrally including PVS visual scores, CVR, BBB leakage and pulsatility index (PI). We ran linear regression models with log-transformed total PVS score as outcome, with vascular risk factors (VRFs: age, smoking status, blood pressure (BP) variability), SVD type, CVR, BBB leakage and mean diffusivity in normal-appearing white matter (NAWM) and venous PI as predictors.

Results: We recruited 77 patients (mean 59.5 years), 45 (58%) sporadic (64.2 years) and 32 (41%) CADASIL (52.9 years). PVS score were higher in patients who were older (B=0.00541, 95%CI=0.00102,0.00981, p=0.017), current/ex-smokers (B=0.0965, 95%CI=0.0156,0.177, p=0.020), had CADASIL (B=0.138, 95%CI=0.0309,0.245, p=0.012), with a tendency to higher BBB leakage (B=0.036, 95%CI=-0.010,0.082, p=0.12), lower venous PI (B=-0.189, 95%CI=-0.495,0.117, p=0.22) and lower CVR (B=-0.17, 95%CI=-1.43,1.10, p=0.79).

Conclusions: In adjusted analyses, patients with more PVS had worse VRFs and worse SVD (CADASIL). Additionally, increased PVS may be a marker of worse vascular dysfunction, and perhaps impaired glymphatic clearance.

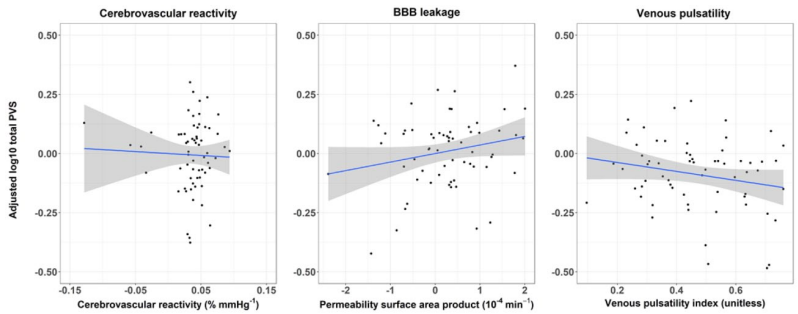

Figure 1. Adjusted log10 total PVS score versus vascular dysfunction measures.

Disclosure of interest: No

O097/2215

Scientific Communication SC16 - Clinical Practice, Management and Care

IMPACT OF STROKE ON SOCIAL CARE SYSTEMS ACROSS EUROPE

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Background and aims: Stroke survivors are at increased risk of both physical and cognitive impairment . As a result, they are likely to require input from social services. However, the European-wide financial impact of long-term social care required by patients with stroke is poorly understood.
Methods: We used data from waves 1 to 8 of the Survey of Health, Ageing and Retirement in Europe (SHARE) to assess the likelihood of institutionalization into a nursing/residential care home across all 27 countries in the EU. Logistic regressions were adjusted for age, sex, presence of other comorbidities, and country of residence, using Estonia (largest group) as the reference case. Using these results we extrapolated across Europe to quantify the economic impact of long-term institutionalization directly attributable to stroke.
Results: Among 73,286 European patients (mean age: 70 years, SD 10; 41,511 females), 3,635 (5%) had a history of stroke. Patients with stroke were more likely to be institutionalized (OR=2.43, 95%:2.05-2.88;$p<0.001$), but not those with CHD (OR=0.99, 0.85-1.15,p=0.88). Patients in Belgium were the most likely to be institutionalized (OR=2.33,$p<0.001$), whereas those in Greece the least (OR=0.07,$p<0.001$). Extrapolating across the EU, 256,000 people are currently institutionalized in long-term care directly attributable to stroke. In 2021, this resulted in annual care costs of €7.45 billion.
Conclusions: Across Europe, stroke is a major predictor of insitutitonalisation, even after adjusting for age and comorbidities, placing a substantial economic burden on under-resourced European social care budgets. Better stroke prevention or improving stroke outcomes will therefore lead to substantial savings.
Disclosure of interest: No

O098/349

Scientific Communication SC16 - Clinical Practice, Management and Care

SYSTEMATIC REVIEW AND SYNTHESIS OF GLOBAL STROKE GUIDELINES FOR THE WORLD STROKE ORGANIZATION

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Background and aims: The World Stroke Organisation Guideline committee was tasked to update its 2014 guidance for stroke.
Methods: We systematically review the literature to identify stroke guidelines (excluding primary stroke prevention and subarachnoid haemorrhage) since 1st January 2011, evaluated quality (AGREE II), tabulated strong recommendations, and judged applicability according to stroke care available (minimal, essential, advanced).
Results: Searches identified 15400 titles, 911 texts were retrieved, 203 publications scrutinized by the three subgroups (acute, secondary prevention, rehabilitation), and recommendations extracted from most recent version of relevant guidelines. For acute treatment, there were more guidelines about ischaemic stroke than intracerebral haemorrhage; recommendations addressed pre-hospital, emergency, and acute hospital care. Strong recommendations were made for reperfusion therapies for acute ischaemic stroke. For secondary prevention, strong recommendations included establishing aetiological diagnosis, management of hypertension, weight, diabetes, lipids, lifestyle modification; and for ischaemic stroke: management of atrial fibrillation, valvular heart disease, left ventricular and atrial thrombi, patent foramen ovale, atherosclerotic extracranial large vessel disease, intracranial atherosclerotic disease, antithrombotics in non-cardioembolic stroke. For rehabilitation there were strong recommendations for organized stroke unit care, multidisciplinary rehabilitation, task specific training, fitness training, and specific interventions for post-stroke impairments.
Most recommendations were from high income countries, and most did not consider comorbidity, resource implications and implementation. Patient and public involvement was limited.
Conclusions: There was extensive repetition and redundancy in guideline recommendations. Future guidelines groups should consider closer collaboration to improve efficiency, include more people with lived experience in the development process, consider comorbidity, and advise on implementation.
Disclosure of interest: Yes

O099/1853

Scientific Communication SC16 - Clinical Practice, Management and Care

PRELIMINARY COST-EFFECTIVENESS ANALYSIS OF THE SECOND EUROPEAN CAROTID SURGERY TRIAL: A MODEL-BASED APPROACH IN THE DUTCH DOMAIN

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Background and aims: The second European Carotid Surgery Trial (ECST-2) randomized patients with carotid artery stenosis ⩾50% at low or intermediate risk of recurrent stroke between optimized medical therapy (OMT) or OMT plus revascularisation. This sub study aims to assess cost-effectiveness of OMT alone when compared to OMT plus revascularisation with regard to two-year follow-up in the Dutch domain.
Methods: A Markov model was created in which modified Rankin Scales (mRS) were used as separate health states. Costs were calculated by questionnaires used in ECST-2 in the Dutch domain and were complemented with MRCLEAN-study data. EQ5D questionnaires were used to determine quality of life. Transition probabilities were calculated using mRS outcomes of ECST-2 obtained at 30 days, one year and 2-year follow-up. Incremental cost-effectiveness ratio (ICER), Tornado diagram and cost-effectiveness probabilities were calculated. A budget impact analysis for the Dutch domain was performed.
Results: OMT alone was cost-effective with a probability of 64% with an ICER of - €38,326.45, compared to OMT plus revascularisation. Tornado diagrams showed highest influence on cost-effectiveness for cost of the mRS 0-2 groups in both study arms. The impact on budget was € 1,069,600 per year.
Conclusions: OMT alone is cost-effective when compared to OMT plus revascularisation when analysed using two-year data. The Markov model showed substantial costs that could be saved in the Netherlands and less surgical procedures could be done in the low to intermediate risk group of carotid stenosis patients. Further five-year follow-up data is required to confirm these findings.
Disclosure of interest: No

O100/896

Scientific Communication SC16 - Clinical Practice, Management and Care

VALIDATION OF A CONDITIONAL PROBABILITY MODEL FOR PRE-HOSPITAL STROKE TRANSPORT USING THE RACE-CAT TRIAL DATA

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Background and aims: Common transport paradigms for patients with suspected large vessel occlusion include *drip and ship* [transport to a closer centre for thrombolysis and secondary transfer for endovascular therapy (EVT)] or *mothership* (direct transport to an EVT centre). Holodinsky et al developed a conditional probability model to determine which method yields best patient outcomes based on hospital and pre-hospital factors. These transport methods were compared in the RACE-CAT trial. We use data from the RACE-CAT trial to validate the model.
Methods: Utilizing a custom-built software the region of Catalonia, Spain was mapped. The region was divided into 1x1km sections representing the possible pick-up location of a patient. Using median hospital work-flow metrics and treatment rates from the RACE-CAT trial the model was applied to the region and the best transport option predicted for each grid. Each patient enrolled in the RACE-CAT trial was mapped along with the randomization allocation. The model output was compared to the RACE-CAT results.
Results: In most of the region there was virtually no difference in modelled patient outcomes between drip and ship and mothership (difference in probability of excellent outcome <0.01) (Figure 1). In two areas furthest from EVT centres, drip and ship was preferred. This is consistent with the overall finding of the RACE-CAT trial of no significant difference in 90-day mRS between mothership and drip and ship groups (aOR 1.05; 95%CI 0.86 – 1.27).
Conclusions: These data from the RACE-CAT trial provide external validation of the previously published model for stroke transport.

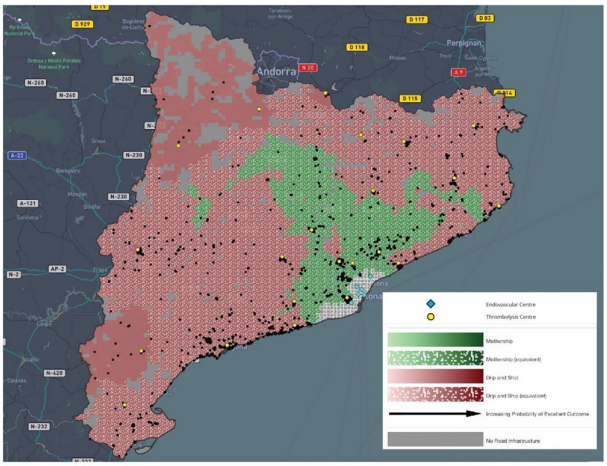

Figure 1. Transport map of Catalonia using model predicted best patient outcomes using hospital specific median treatment times and global study probabilities of receiving treatment for patients with RACE ≥5 (using diagnostic distribution derived from study). Blue diamonds represent EVT centres, yellow circles represent thrombolysis centres, black dots represent actual patient pick up locations from the RACE-CAT trial. Areas in red indicate drip and ship provides the greatest predicted probability of excellent outcome (mRS 0-1 at 90 days), areas in green indicate mothership provides the greatest predicted probability of excellent outcome, grey areas indicate no road infrastructure, white boxed area in Barcelona was not eligible for randomization in trial (EVT centre is closest). Areas with white stippling overlay indicate the absolute difference in probability of mRS0-1 at 90 days is < 0.01 (or 1%).

Disclosure of interest: Yes

O101/1132

Scientific Communication SC16 - Clinical Practice, Management and Care

DOES MEETING PERFORMANCE TARGETS IN HYPERACUTE STROKE CARE TRANSLATE INTO GOOD PATIENT OUTCOMES? RETROSPECTIVE OBSERVATIONAL HOSPITAL COHORT STUDY

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Background and aims: In the UK, the stroke clinical pathway and quality of care delivered are audited by the Sentinel Stroke National Audit Programme (SSNAP). We assessed whether meeting the expected national SSNAP hyperacute care targets is associated with better clinician or patient-reported outcome measures (PROMs) 6-months after stroke.
Methods: This retrospective study included patients with stroke admitted to University College London Hospitals between 01 November 2018 and 31 October 2019. We used the modified Rankin Scale (mRS) and the patient-reported Stroke Impact Scale 3.0 (SIS-3.0) to measure outcomes at 6-months and performed multivariable regression analysis to identify associations between meeting SSNAP targets and good outcomes.

Results: 1135 patients were included (median age 74 (IQR61-84), 81% with ischaemic stroke and 54.5% males). Stroke unit admission within 4 hours was associated with higher activities of daily living (ADL) OR-5.34 (95%CI:0.76-9.92), mobility OR-4.32 (95%CI:0.35-8.29), and physical domain OR-4.44 (95%CI:0.33-8.54) scores on the SIS-3.0 scale. Brain imaging within an hour and swallow screening within four hours of admission were associated with higher physical domain OR-4.7 (95%CI:0.80-8.60) and social participation OR-6.07 (95%CI:1.19-11.68) scores, respectively. Meeting time to therapy assessments was associated with increased scores for ADL, mobility, communication, and subjective memory. No significant association between meeting SSNAP targets and mRS scores was identified.
Conclusions: Achieving SSNAP targets is associated with better PROMs but not the mRS. These findings suggest that the quality of hyperacute stroke care is important in maximising patient-reported health outcomes but may not influence outcomes as measured by the mRS.
Disclosure of interest: No

O102/449

Scientific Communication SC16 - Clinical Practice, Management and Care

ACUTE REPERFUSION THERAPY IN LATE WINDOWS IN THE NETHERLANDS – REAL-WORLD NATIONWIDE DATA FROM THE DUTCH ACUTE STROKE AUDIT

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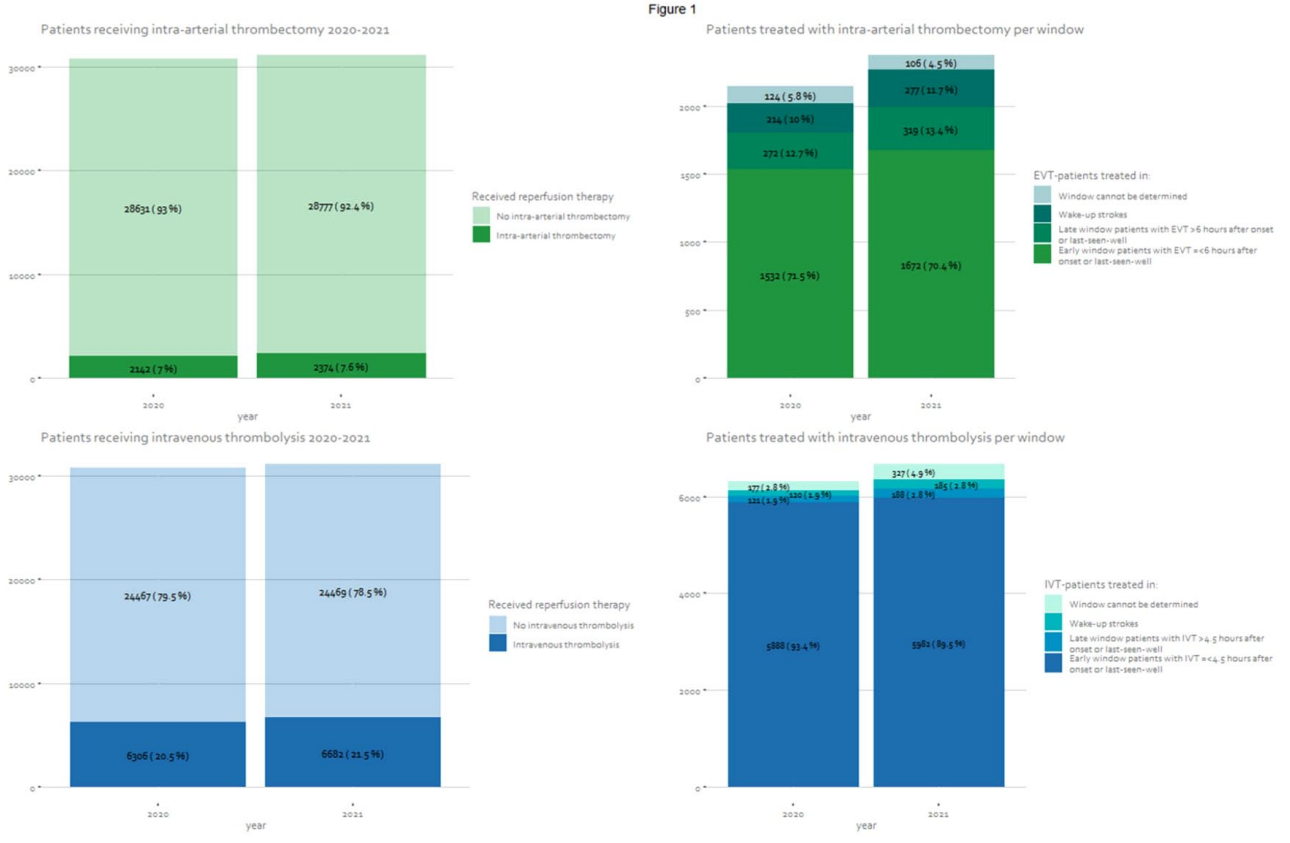
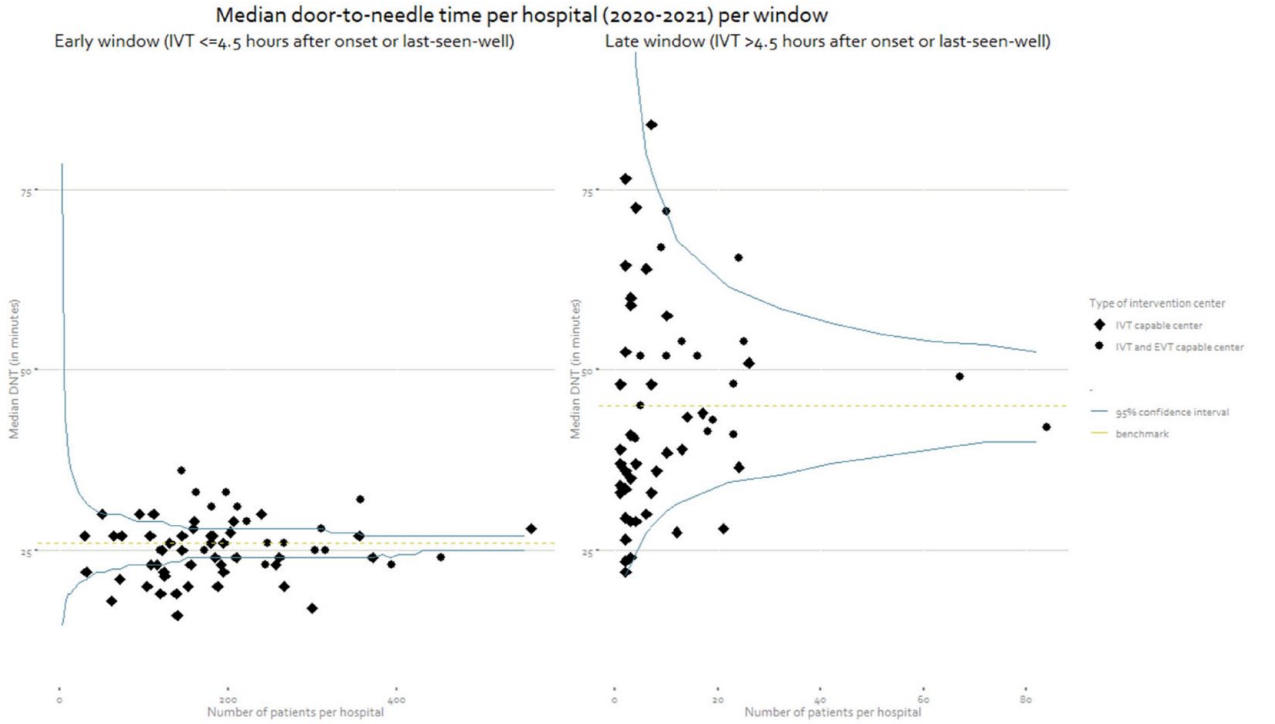
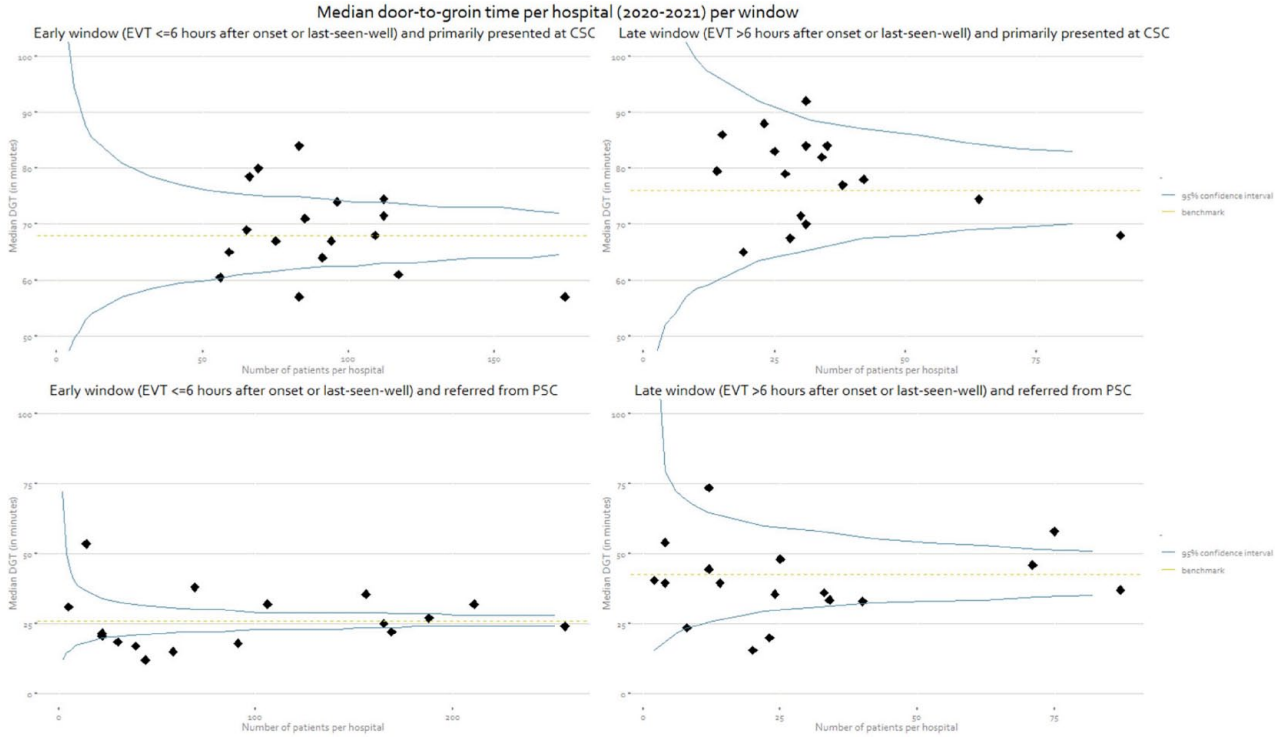
Background and aims: Trials have shown that acute ischemic stroke (AIS) patients could benefit from treatment with intravenous thrombolysis (IVT) and endovascular thrombectomy (EVT) beyond 4.5, respectively, 6 hours after symptom onset. This study aims to assess rates, characteristics and outcomes of patients treated in these late windows in daily clinical practice in the Netherlands.
Methods: All consecutive AIS-patients (⩾18 years old) presented in Dutch hospitals between 2020-2021 were included (2022 data will be presented at ESOC). Late-window patients (LWP) were compared to early-window patients. Patients were considered to be LWP if they were treated ⩾4.5 hours (IVT) or ⩾6 hours (EVT) after symptom onset or last-seen-well (LSW), or if they had a wake-up stroke.
Results: In total, 12,484 patients treated with IVT were included, of whom 614 were LWP (median onset/LSW-to-door time 6.4 hours). LWP had longer median door-to-needle times (45 vs. 26 minutes, p<0.01) and a trend towards worse outcomes at three months (mRS 0-2 56.3% vs. 60.8%, p 0.05). In total, 4,286 patients treated with EVT were included, of whom 1,082 were LWP (median onset/LSW-to-door 10.4 hours). LWP had longer median door-to-groin times (63 vs. 46 minutes, p <0.01) and worse outcomes (mRS 0-2 35.5% vs. 40.9%, p <0.01). Figure 1 shows treatment numbers per year.
Conclusions: Patients were more often treated with IVT and EVT in 2021 compared to 2020, in total and in late windows. LWP have longer median door-to-treatment times and (a trend towards) worse functional outcomes at three months.

Figure 1







Disclosure of interest: No

O103/2444

Scientific Communication SC16 - Clinical Practice, Management and Care

SMOKING CESSATION AND DEATH OR RECURRENCE OF CARDIOVASCULAR EVENTS IN A LONG-TERM, RANDOMIZED CONTROLLED TRIAL

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Background and aims: About 50% of patients continue to smoke after stroke and other cardiovascular events. We aimed to assess 1) the effect of telephone-based advice by a nurse on long-term smoking cessation and 2) association between early smoking cessation and long-term prognosis.
Methods: The NAILED trial included patients with stroke/TIA/acute coronary syndrome at Östersund Hospital during 2010-2014. Participants were randomized to nurse-based, telephone follow-up (intervention) or usual care (control) and followed until 31-dec-2017. The intervention consisted of yearly assessment of modifiable risk factors and lifestyle consultation including advice to quit smoking. Participants that reported current smoking during hospitalization and were alive at 1 month when the intervention began were included in this sub study (n=313). We used chi^2-test to compared self-reported smoking cessation at the last follow-up. Association between smoking cessation and 1) recurrence of major cardiovascular events, MACE (stroke, myocardial infarction, cardiac revascularization, cardiovascular death), and 2) all-cause mortality was analyzed using Kaplan-Meier survival analysis with log rank test.
Results: After a mean follow-up of 4.2 years, 165 participants reported non-smoking, 50.3 % and 55.2 % in the intervention and control group (p=0.387), respectively. Of these, 79.4 % had stopped smoking within 1 month after discharge. A MACE occurred in 72 participants and 59 participants died. Smoking cessation within 1 month was associated with lower incidence of MACE (p=0.039) and lower all-cause mortality (p=0.004).
Conclusions: Yearly consultation with a nurse did not improve long-term smoking cessation after stroke/TIA/ACS. Continued smoking past 1 month was associated with worse prognosis.
Disclosure of interest: No

O104/2107

Scientific Communication SC16 - Clinical Practice, Management and Care

HOW DOES A CANCER DIAGNOSIS IN THE YEAR PRECEDING STROKE ADMISSION AFFECT STROKE CARE AND OUTCOMES?

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Background and aims: Stroke and cancer are leading causes of death worldwide. There is currently limited information on how best to treat patients with both diseases and how cancer affects outcomes following stroke.
Methods: Patients with a first-ever stroke in Scotland between 2011-2018 were included through data linkage of the Scottish Stroke Care Audit, Scottish Cancer Registry, and death certification data. Two study cohorts were generated: 1) stroke only, and 2) stroke with cancer diagnosed in the year prior to or at stroke admission. Main outcomes were receipt of a stroke care bundle, 30-day discharge, and one-year survival.
Results: 55365 first-ever stroke patients from 2011 to 2018 were included in the study: those with stroke only (n=53345, median age 73 [IQR 62-82], 50.3% female) and those with cancer and stroke (n=2020, median age 76 [IQR 68-82], 47.7% female). The five most common cancer types were lung (20.9%); melanoma (18.5%); colon (10.9%); prostate (6.2%); breast (6.1%). After adjustment for age, sex, and stroke severity, outcomes for those with cancer and stroke compared to those with stroke only were: stroke care bundle [OR 0.95 (95% CI 0.86-1.04)]; discharge to patients' usual residence by 30 days [OR 0.70 (95% CI 0.63-0.78)]; one-year hazard for death from stroke admission [HR 2.69 (95% CI 2.53-2.86)].
Conclusions: Stroke patients with a cancer diagnosis were not disadvantaged in terms of receiving a stroke care bundle but were less likely to be discharged within 30 days and were at greater risk of dying in the year following stroke.
Disclosure of interest: No

O105/847

Scientific Communication SC17 - Genetics, Omics and Biomarkers

ASSOCIATION OF VARIANTS CAUSING MONOGENIC STROKE WITH MRI MARKERS OF CEREBRAL SMALL VESSEL DISEASE IN THE GENERAL POPULATION

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Background and aims: While monogenic stroke due to *NOTCH3* (CADASIL), autosomal dominant *HTRA1* and *COL4A1/2* are rare (eg 4/100,000 for CADASIL), similar pathogenic variants in the underlying genes are commoner than expected in community populations (eg 1/800 for CADASIL). We investigated whether these variants were associated with neuroimaging features of cerebral small vessel disease (cSVD).
Methods: *HTRA1* and *COL4A1/2* variants reported in familial cSVD patients were examined for pathogenicity using the ACMG guidelines. These pathogenic variants, along with the established cystine-changing *NOTCH3* variants, were identified in UK Biobank participants with whole-exome sequencing and MRI. Lacunar infarcts (LI), cerebral microbleeds (CMBs), and white matter hyperintensities (WMH) were compared between variants carriers and 1:3 matched controls. Linear regression models were fitted adjusting for age, ethnicity, sex, sequencing batch, and genetic principal components.
Results: Of 38,332 participants, we identified 92 *NOTCH3*, 44 *HTRA1*, and 28 *COL4A1/2* variant carriers. *NOTCH3* variants presented higher LI count (standardised difference: 0.58, 95%CI:0.33-0.83), CMB count (0.43, 95%CI:0.17-0.68) and WMH severity (0.51, 95%CI:0.29-0.73). *HTRA1* variants were associated with higher LI count (1.03, 95%CI:0.67-1.38) and WMH severity (0.44, 95%CI:0.11-0.76). *COL4A1/2* variants were not associated with CMBs (-0.04, 95%CI:−0.48-0.40) or WMH (0.21, 95%CI:−0.14-0.57). NOTCH3 variant carriers had a similar WMH

distribution to clinical CADASIL with involvement of the anterior temporal pole and external capsule.
Conclusions: The same *NOTCH3* and *HTRA1* variants which cause clinical familial disease are associated with MRI features of cSVD in community populations. This suggests monogenic stroke variants contribute to cSVD burden in the general population.
Disclosure of interest: No

O106/1194

Scientific Communication SC17 - Genetics, Omics and Biomarkers

DISEASE TRAJECTORY IN INDIVIDUALS WITH RARE VARIANTS IN SEVEN CEREBROVASCULAR SMALL VESSEL DISEASE GENES: A GENOTYPE-FIRST, RACE- AND SEX-STRATIFIED STUDY

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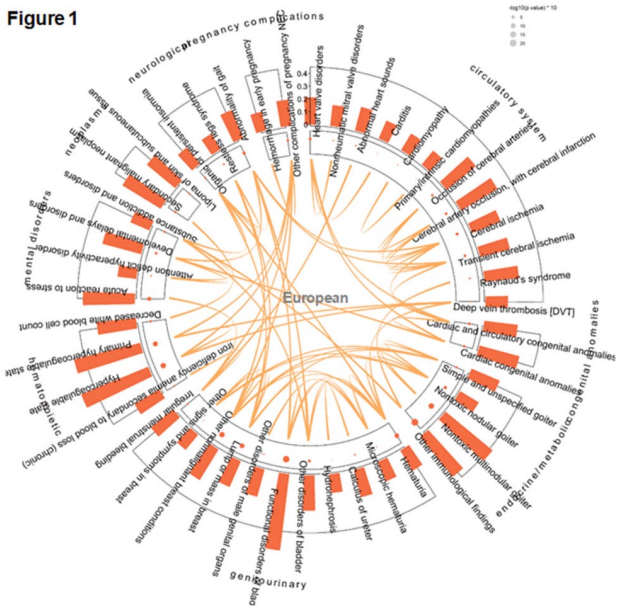
Background and aims: To explore the risk for a lifetime or early onset of cardiovascular diseases and diseases within or beyond the circulatory system observed in rare variant(RV) carriers of seven well-characterized monogenic cerebral small vessel disease (CSVD) risk genes (*COL4A1, COL4A2, NOTCH3, HTRA1, TREX1, CTC1*, and *GLA*) using a genotype-first approach within a hospital system population-based biobank cohort.
Methods: MyCode participants with sequenced exomes were temporally split into discovery (n=92,445) and replication (n=81,130) cohorts. A workflow was created to prioritize potentially pathogenic variants. The number of participants in both discovery and replication cohorts was 2738/5490 and 1695/3410 for carriers and matched noncarriers, respectively.
Results: Most of the RVs identified were in a heterozygous form and disproportionately present in participants with African ancestry. Carriers showed an increased risk for early signs and symptoms of cerebrovascular disease(Figure 1). Multivariate Cox regression model showed *NOTCH3*(European), *TREX1*(European), and *COL4A1/A2*(African) were associated with ischemic stroke ($HR_{earlyonset}$=1.378[1.01-1.881], p=0.043; $HR_{earlyonset}$=1.784[1.119-2.843], p=0.015; $HR_{lifetime}$=2.032[1.065-3.875], p=0.031, respectively). Unlike *COL4A1/A2*(African), the effect for *NOTCH3*(European) or *TREX1*(European) was predominantly from either discovery or replication cohort($HR_{earlyonset}$=2.175[1.391-3.403], p=0.001 for *NOTCH3*; $HR_{earlyonset}$ = 4.006[1.797-8.931], p=0.001 for *TREX1*). Circulatory diseases were overrepresented in both cohorts with an early-onset of cardiovascular phenotypes irrespective of race. Sex-dependent effect for cerebrovascular disease risk was detectable in *NOTCH3* ($p_{interaction}$=0.04 for Carrier*Female term).
Conclusions: Carriers for monogenic CSVD risk genes demonstrated the increased risk for the lifetime or early onset of cerebrovascular disease and diseases within or beyond the circulatory system, some of which in a race- and sex-dependent manner.

Figure 1



Disclosure of interest: No

O107/560

Scientific Communication SC17 - Genetics, Omics and Biomarkers

CARRIERS OF RARE DAMAGING CCR2 GENETIC VARIANTS ARE AT LOWER RISK OF ATHEROSCLEROTIC disease

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Background and aims: The CCL2/CCR2 axis governs monocyte trafficking and recruitment to atherosclerotic lesions. Pharmacological inhibition of CCR2 in mice protects against atherosclerosis. Whether pharmacological targeting of CCR2 would be atheroprotective in humans remains unknown.
Methods: Using whole-exome-sequencing data from 454,775 UKB participants, we searched for predicted loss-of-function (pLoF) or damaging missense variants within *CCR2*. We prioritized variants associated with lower monocyte count (MC, $p<0.05$) and tested associations with vascular risk factors and risk of atherosclerotic disease. The results were replicated in three independent biobanks and the functional consequences of the most frequent variant were experimentally validated.
Results: We identified 45 pLOF/damaging missense variants in CCR2. In a burden test using these variants, we found associations with lower MC and risk of myocardial infarction (MI; OR: 0.60, 95%CI: 0.40-0.90). Four of the variants were nominally associated with lower MC and showed an association with lower risk of MI and other atherosclerotic diseases. Experimentally, cells transfected with the most frequent CCR2 variant (M249K, frequency: 0.14%) showed a profound reduction in response to CCL2 (cAMP assay).

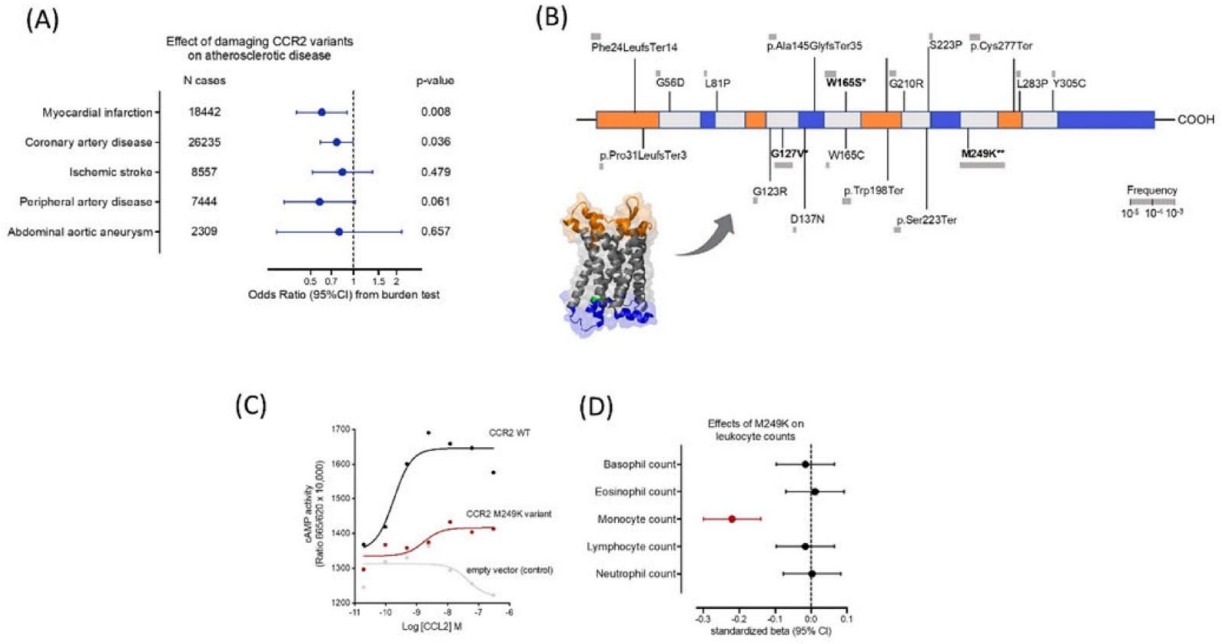

Fig 1: (A) Results of burden test of damaging CCR2 variants on atherosclerotic disease (B) identified damaging variants in CCR2 (C) functional assay of the M249K variant on CCL2-CCR2 signalling (D) Effect of M249K on leukocyte phenotypes in the UK Biobank

This variant was associated with lower MC while showing no association with vascular risk factors. Findings were replicated in samples from other biobanks (N=1,000,000) showing reductions in risk of MI (MI: OR: 0.61, 95%CI: 0.44-0.86; with similar results for ischemic stroke).

Conclusions: Heterozygote carriers of damaging CCR2 variants have a lower lifetime risk of atherosclerotic disease. Together with previous evidence from experimental and epidemiological studies, our findings highlight the translational potential of targeting CCR2 for atheroprotection.

Disclosure of interest: No

O108/627

Scientific Communication SC17 - Genetics, Omics and Biomarkers

GENOME-WIDE STUDY REVEALS NOVEL SEX-SPECIFIC LOCI ASSOCIATED WITH LACUNAR STROKE

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Background and aims: Little is known about the genetic architecture of lacunar stroke (LS) risk, and the known loci do not explain the overall complexity of the disease. We sought to identify sex specific loci that help explain the mechanistic of LS.

Methods: We included 288 MRI-confirmed LS, and 5,589 non-stroke controls with genetic data available. Single variant analyses were performed using GCTA using the additive model adjusted by age, sex and the first ten genetics principal components. Then we performed the same analysis stratifying by sex to investigate potential loci. Significant threshold was stablished at $p<5x10^{-8}$. Gene-based analysis were performed using

MAGMA. Replication was explored in MEGASTROKE and GIGASTROKE cohorts for LS in European population. *In silico* proteomic analysis was performed on whole blood from the INTERVAL cohort (3,301 individuals) for the replicated variants.
Results: We identified one locus in chromosome 5 in both sexes analysis, rs59970332-T ($p=1.99x10^{-8}$;beta(standard error)=0.08(0.01)), prioritised gene *CTNND2*, with the strongest association in male analysis ($p=5.19x10^{-8}$). In females, we identified a private a locus in chromosome 8, rs146966463-C ($p=6.60x10^{-9}$;beta(standard error)=0.08(0.01)), prioritised gene *FGFR1*. Pathways' analyses revealed the involvement of different interleukins, as well as amyloid clearance of the brain as potential players of this genetic susceptibility.
Conclusions: We found two novel loci associated with LS risk in the first stratified by sex analysis in this phenotype. We identified *CTNND2* and *FGFR1* as promising genes associated with LS risk. Further analyses are warranted to understand the role of these two genes in the disease.
Disclosure of interest: No

O109/633

Scientific Communication SC17 - Genetics, Omics and Biomarkers

GENETIC VARIATION SUPPORTS A CAUSAL EFFECT OF VALPROATE FOR PREVENTION OF ISCHEMIC STROKE

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Background and aims: Valproate is a candidate for ischemic stroke (IS) prevention due to its inhibition of histone deacetylase. Although valproate use is associated with decreased IS risk in observational studies, confounding by indication precludes causal conclusions. To overcome this limitation, we applied Mendelian randomization to determine whether among valproate users genetic variants that influence clinical response associate with incident IS.
Methods: A genetic score for valproate seizure response, derived from genome-wide association data from the EpiPGX consortium, was tested for association with incident IS among valproate users in the UK Biobank.
Results: Among 2,351 valproate users (mean 56 years, 54% females), 58 IS occurred over a median 12-year follow-up. A higher genetic score was associated with an increased effect of valproate dose on serum valproate levels (+0.4 mcg/ml per 100mg/day per one SD, 95%CI [0.1, 0.7]). After adjusting for valproate dose, a higher genetic score was associated with lower IS risk (HR per one SD 0.76, [0.59, 0.98]). Among 212 valproate users with prevalent stroke, fewer IS occurred among individuals in the highest compared to the lowest score quintile (2.4% vs. 13.5%; p-trend=0.06). The genetic score was not associated with incident IS among 484,946 valproate non-users (p=0.53), thus minimizing the risk of pleiotropic effects of the variants.
Conclusions: Among valproate users, genetically predicted elevated valproate response was associated with reduced IS risk, providing causal support for valproate utility in IS prevention. Clinical trials are warranted to identify populations that may benefit from valproate for this indication.
Disclosure of interest: No

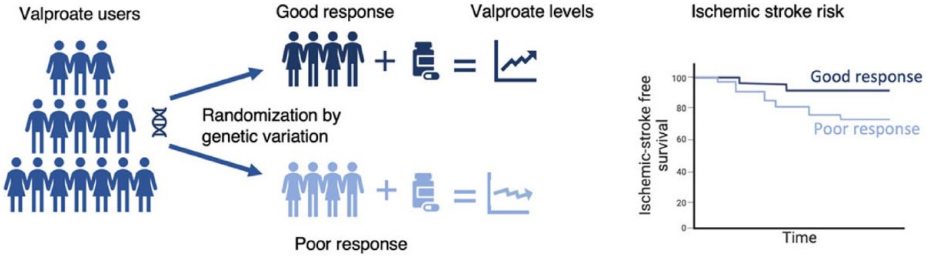

Figure 1. Study overview

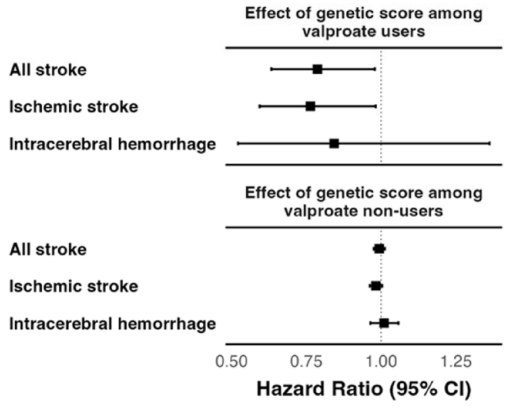

Figure 2. Effect estimates of one standard deviation of the genetic score among valproate users and valproate non-users.

O110/33

Scientific Communication SC17 - Genetics, Omics and Biomarkers

ASSOCIATIONS OF CLONAL HAEMATOPOIESIS WITH RECURRENT VASCULAR EVENTS AND DEATH IN PATIENTS WITH INCIDENT ISCHAEMIC STROKE

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[2]*Charité-Universitätsmedizin-Berlin, Oncology, Berlin, Germany*

Background and aims: Clonal haematopoiesis (CH) is common among older people and associated with an increased risk of atherosclerosis and inflammation. Age and inflammation are major risk factors for ischaemic stroke, yet the association of CH with risk of secondary vascular events and death is unknown.
Methods: We investigated CH in peripheral blood DNA from 581 patients with first-ever ischaemic stroke from the Prospective Cohort with Incident Stroke-Berlin study (PROSCIS-B) using error-corrected targeted sequencing. The primary composite endpoint (CEP) consisted of recurrent stroke, myocardial infarction, and all-cause mortality.
Results: 348 somatic mutations with a variant allele frequency $\geqslant$ 1% were identified in 236/581 patients (41%). CH was associated with large-artery atherosclerosis stroke ($P = 0.01$) and white matter lesion ($P < 0.001$). CH-positive patients showed increased levels of pro-inflammatory cytokines such as IL-6, IFN-γ, hsCRP, and VCAM-1. CH-positive patients had a higher risk for the primary CEP (HR: 1.55, 95%-CI 1.04 – 2.31, $P = 0.03$), which was more pronounced in patients with larger clones. CH clone size remained an independent risk factor (HR 1.30, 95%-CI 1.04 – 1.62, $P = 0.022$) in multivariable Cox regression. In particular, larger and *TET2*- or *PPM1D*-mutated clones are associated with increased risk of recurrent vascular events and death, a common hypomorphic germline variant of the IL-6 receptor (*IL6R* p.D358A) negates this effect partially.
Conclusions: The CH mutation profile is accompanied by a pro-inflammatory profile opening new avenues for preventive precision medicine approaches to resolve the self-perpetuating cycle of inflammation and clonal expansion.
Disclosure of interest: No

O111/530

Scientific Communication SC17 - Genetics, Omics and Biomarkers

CIRCULATING PROTEOMIC PANELS FOR CEREBRAL AMYLOID ANGIOPATHY SCREENING AND RISK STRATIFICATION

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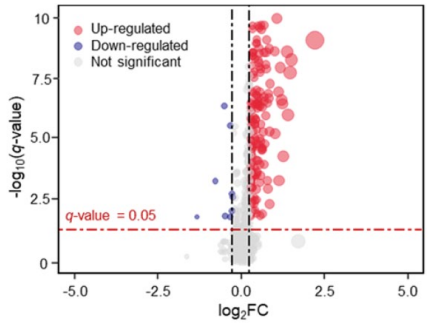
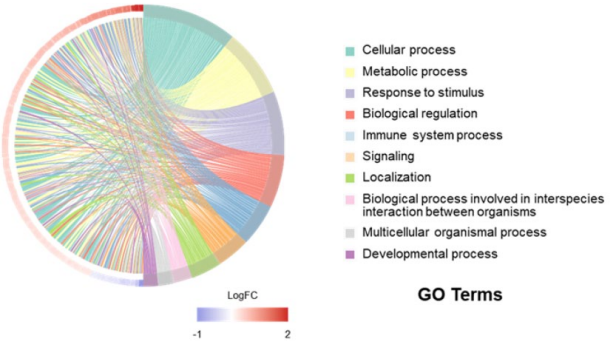
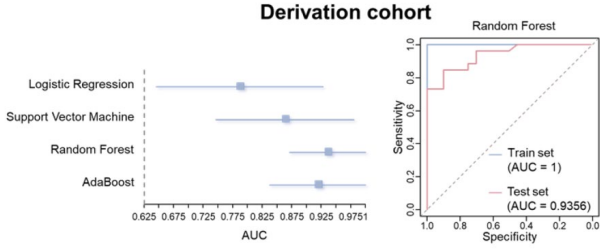
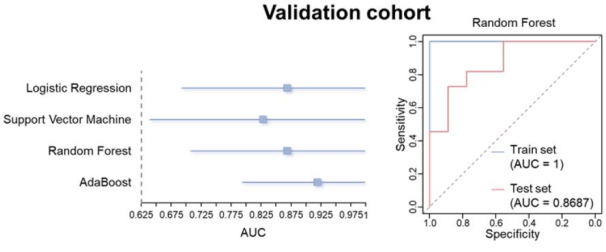
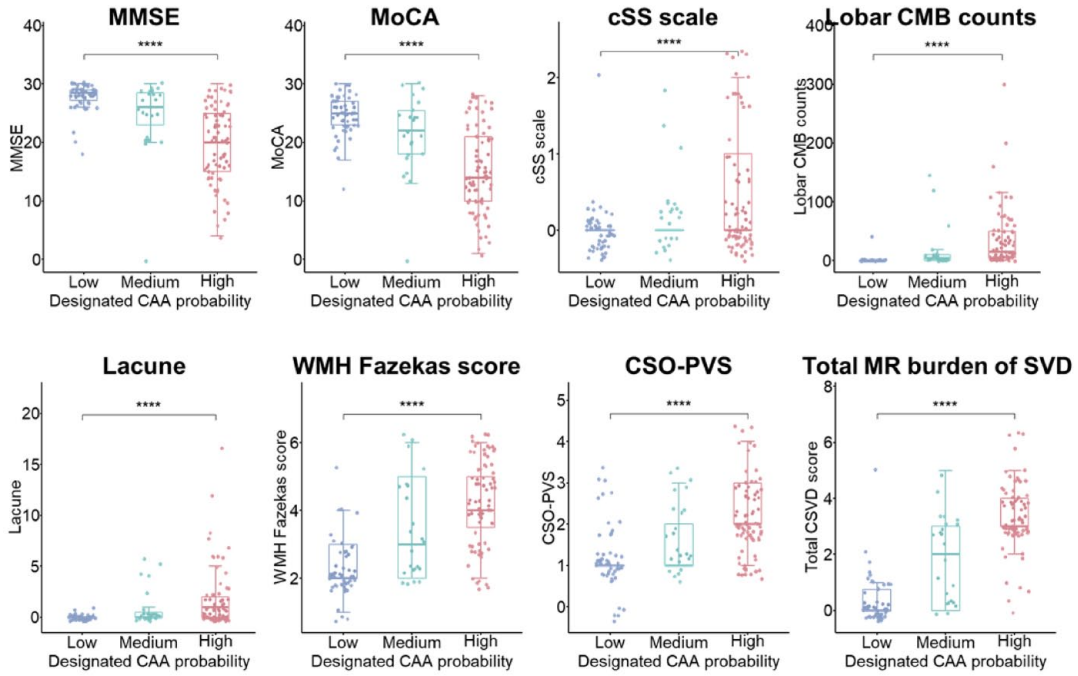
Background and aims: Blood proteins are emerging as promising biomarkers for cerebral amyloid angiopathy (CAA). We aimed to depict the plasma protein profiles of CAA with proteomics and develop a model of disease screening and risk stratification.
Methods: 119 patients with probable CAA and 98 normal controls were prospectively recruited and were divided into the derivation (70%, n=152) and validation (30%, n=65) cohorts. Proteomics with nano high-performance liquid chromatography mass spectrometry was performed on plasma samples. Machine learning algorithms were applied to establish the model of hub proteins in the derivation cohort and validate the same panel in the validation cohort.
Results: In the derivation cohort, 203 differentially expressed proteins were identified in patients with CAA compared with controls. Six hub proteins (DDAH2, USP15, ARPC4, DDK3, CTSH and FGA) were selected to establish the CAA diagnostic model with machine learning algorithms in the derivation cohort (AUC of logistic regression, 0.787; AUC of random forest, 0.936; AUC of support vector machine, 0.863; AUC of AdaBoost, 0.919) and in the validation cohort (AUC of logistic regression, 0.869; AUC of random forest, 0.869; AUC of support vector machine, 0.828; AUC of AdaBoost, 0.919). The participants were stratified into low, medium and high-risk groups based on the individual probability of CAA calculated with random forest algorithm. Cognitive function and small vessel disease neuroimaging markers were significantly different among three groups (all $P < 0.001$).
Conclusions: The plasma proteomic panel showed distinct protein signatures in CAA, which were correlated with cognitive function and disease severity.











Disclosure of interest: No

O112/60

Scientific Communication SC17 - Genetics, Omics and Biomarkers

COMPARISON OF ACUTE AND CHRONIC STAGE ISCHEMIC STROKE METABOLOME WITH CONTROLS

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Background and aims: Stroke is a major cause of disability in the United States. Separate case-control and longitudinal studies have not demonstrated a distinct metabolomic profile of acute ischemic stroke. Therefore, we performed a simultaneous comparison of the ischemic stroke metabolome in the acute and chronic stages of stroke and in controls.

Methods: Through the nuclear magnetic resonance (NMR) platform, we evaluated 271 serum metabolites from a cohort of 297 stroke patients in acute and chronic stages and 159 controls. We used Sparse Partial Least Squares-Discriminant analysis (sPLS-DA) to evaluate group disparity; multivariate regression to compare the metabolome in the acute and chronic stages of stroke with that of controls; and mixed regression for comparison of the acute and chronic stages of stroke, applying false discovery rate (FDR).

Results: The sPLS-DA revealed separation of the metabolome in acute and chronic stages of stroke and controls. Regression analysis identified 38 altered metabolites. Ketone bodies, branched-chain amino acids (BCAAs), energy, and inflammatory compounds were elevated in the acute stage, but declined in the chronic stage, often to the same levels as found in controls. Levels of other amino acids, phosphatidylcholines, phosphoglycerides, and sphingomyelins remained altered from the acute stage to the chronic stage compared with controls, reflecting a baseline difference in metabolism in stroke and non-stroke patients.

Conclusions: Our pilot study segregated metabolites driven by stroke acuity from those that have baseline alteration in stroke and non-stroke individuals. Future investigation in a larger independent cohort is needed to validate these findings.

Disclosure of interest: No

O113/1254

Scientific Communication SC18 - SAH and ICH

DECOMPRESSIVE SURGERY AFTER INTRACEREBRAL HAEMORRHAGE: SECONDARY ANALYSIS OF INTERACT3 TRIAL

Menglu Ouyang*[1,2], Xin Hu[3], Lili Song[2], Lu MA[3], Xiaoying Chen[1], Laurent Billot[1], Qiang LI[1], Alejandra Malavera[1], XI LI[1], Paula Munoz Venturelli[1,4], Asita Silva[5], Nguyen Huy Thang[6], Kolawale Wahab[7], Jeyaraj Pandian[8], Mohammad Wasay[9], Carlos Abanto[10], Antonio Arauz[11], Xia Wang[1], Chao You[3], Craig Anderson[1,2,4,12]

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Manuel Velasco Suarez, Mexico City, Mexico, [12]*Neurology Department, Royal Prince Alfred Hospital, Sydney, Australia*

Background and aims: There is ongoing controversy over the balance of benefits and risks of surgery to decompress the haematoma in acute intracerebral haemorrhage (ICH), and particularly over the optimal timing to intervene.
Methods: Pre-specified secondary analysis of INTERACT3, an international, multicentre, stepped-wedge cluster randomised controlled trial where data were collected on the type and timing of decompressive surgery. The primary outcome of functional recovery on the modified Rankin scale was assessed at 6 months. Ordinal logistic regression models were used to determine associations of decompressive surgery and functional outcome, with adjustments for study design effects and patient variables; meta-regression was used to assess the treatment effect by time.
Results: Of a total of 7064 patients (mean age 62±13 years, female 36.1%) recruited at 122 hospitals in 10 countries during 2017-2021, 1860/6998 (26.6%) had decompressive surgery performed within 7 days of hospitalisation including 31.0% on the same date as hospital arrival. The most common procedures were decompressive craniotomy (55.6%), intraventricular drainage (18.9%) and aspiration (10.7%). The outcome analyses will be presented.
Conclusions: This study included a large number of patients with a broad range of characteristics to allow exploration of the effects of decompressive surgery by time on the outcome from ICH. In the absence of surgical trial data, these results may help inform clinical practice and research.
Disclosure of interest: No

O114/1325

Scientific Communication SC18 - SAH and ICH

ANTICOAGULATION AMONG ATRIAL FIBRILLATION PATIENTS WITH THEIR FIRST-EVER HAEMORRHAGIC STROKE

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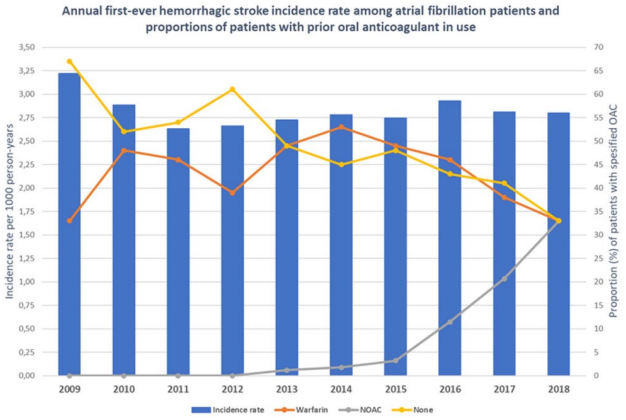
[1]*University of Helsinki, Faculty of Medicine, Helsinki, Finland,* [2]*Aalto University, Industrial Engineering and Management, Espoo, Finland,* [3]*University of Helsinki, Public Health, Helsinki, Finland,* [4]*University of Helsinki, Clinical Pharmacology, Helsinki, Finland,* [5]*Helsinki University Hospital, Heart and Lung Center, Helsinki, Finland,* [6]*Turku University Hospital and University of Turku, Internal Medicine, Turku, Finland,* [7]*University of Eastern Finland and Kuopio University Hospital, Faculty of Social Sciences and Business Studies, Department of Health and Social Management, Kuopio, Finland,* [8]*University of Eastern Finland and Kuopio University Hospital, Cardiology, Kuopio, Finland,* [9]*Turku University Hospital and University of Turku, Cardiology, Turku, Finland,* [10]*Helsinki University Hospital and University of Helsinki, Neurology, Helsinki, Finland,* [11]*Helsinki and Uusimaa Hospital District, Jorvi Hospital, Internal Medicine, Espoo, Finland*

Background and aims: Among atrial fibrillation (AF) patients, non-vitamin K anticoagulants (NOACs) approximately halve the risk for haemorrhagic stroke (HS) compared to warfarin. Scarce data exist on the risk of oral anticoagulant (OAC) associated HS over time in the NOAC era. We assessed trends in OAC usage in patients with AF at their first-ever HS over a 10-year period.
Methods: Of the nationwide registry-based Finnish AntiCoagulation in Atrial Fibrillation (FinACAF) study, we included patients with incident AF diagnosed between January 2009 and November 2017 without prior intracranial haemorrhage and observed first-ever HS (ICD-10 I60* or I61*) occurring between January 2009 and November 2018. OAC purchases within 90 days prior to HS were registered.
Results: Of the 168,121 patients (53% women, median age 79,5 [IQR 72.5-85.5]; 676,681 person-years of follow-up), 1,890 experienced HS after a median follow-up time of 2.2 years from the AF diagnosis. The crude incidence rate of HS was 2.79 per 1,000 person-years (95% confidence interval 2.67-2.92), without significant trend during ten years of observation. Towards the end of observation, fewer AF patients were without OAC or had warfarin purchased prior to HS. The proportion of patients with NOAC begun to increase in 2015 and was 33% in 2018.
Conclusions: During the era of the introduction of NOACs, the incidence of first-ever HS in patients with AF was stable in Finland. Yet we observed a profoundly increasing number of patients on NOAC among patients with AF and first-ever HS.



Disclosure of interest: No

O115/1856

Scientific Communication SC18 - SAH and ICH

COLLAGEN BREAKDOWN PRODUCTS AS BIOMARKERS FOR STRUCTURAL INSTABILITY IN INTRACRANIAL ANEURYSMS

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[1]*University Hospital Mannheim, University of Heidelberg, Department of Neurosurgery, Mannheim, Germany,* [2]*University Hospital Mannheim, University of Heidelberg, Department of Neuroradiology, Mannheim, Germany,* [3]*University Hospital Mannheim, University of Heidelberg, Institute for Clinical Chemistry, Mannheim, Germany*

Background and aims: The individual rupture risk of intracranial aneurysms (IA) is uncertain. The main molecular component in IA is collagen type I, which undergoes permanent turnover. We hypothesized that collagen breakdown products from IA could serve as a novel biomarker for the rupture risk in patients with IA.
Methods: Blood samples from patients with ruptured and unruptured IA were obtained during catheter angiography from femoral artery and intra-aneurysmal (intra-IA). Venous blood samples were obtained from IA patients and controls (no IA). Detection of collagen breakdown products c-terminal-telopeptide of type-I-collagen (ICTP) was performed by radioimmunoassay. Recently grown, symptomatic or ruptured IA were defined as instable.
Results: Between 10/2018 and 04/2022 105 subjects, 63 patients (20 stable, 43 instable IA) with 57.3±10.6 years and 42 controls with 54.6±15.8 years were included. There was a significant correlation ($r=0.65$, $p<0.001$) of intra-IA ICTP levels with venous levels. Venous

ICTP levels in patients were significantly higher compared to controls (7.14±4.46ng/ml,3.91±2.55ng/ml; p<0.001). In patients venous ICTP levels were a significant predictor for IA instability (p=0.001;OR 1.35,95%CI 1.08-1.69) with an AUC of 0.91 (ROC-analysis, p<0.001). Patients with high venous ICTP levels had a fourfold higher risk of harbouring an instable IA than a stable IA (p=0.01; OR 4.04,95%CI 1.28-12.75) and an almost sixfold higher chance of having an irregular IA than a regular IA (p<0.01; OR 5.70,95%CI 1.40-23.30).

Conclusions: ICTP could serve as a novel biomarker for prediction of the future risk of IA rupture, if our data can be replicated in an external IA cohort.

Disclosure of interest: No

O116/512

Scientific Communication SC18 - SAH and ICH

ASSOCIATION BETWEEN THE EDINBURGH CT-ONLY DIAGNOSTIC CRITERIA FOR CEREBRAL AMYLOID ANGIOPATHY-ASSOCIATED LOBAR INTRACEREBRAL HAEMORRHAGE AND RECURRENT INTRACEREBRAL HAEMORRHAGE: INDIVIDUAL PARTICIPANT DATA META-ANALYSIS

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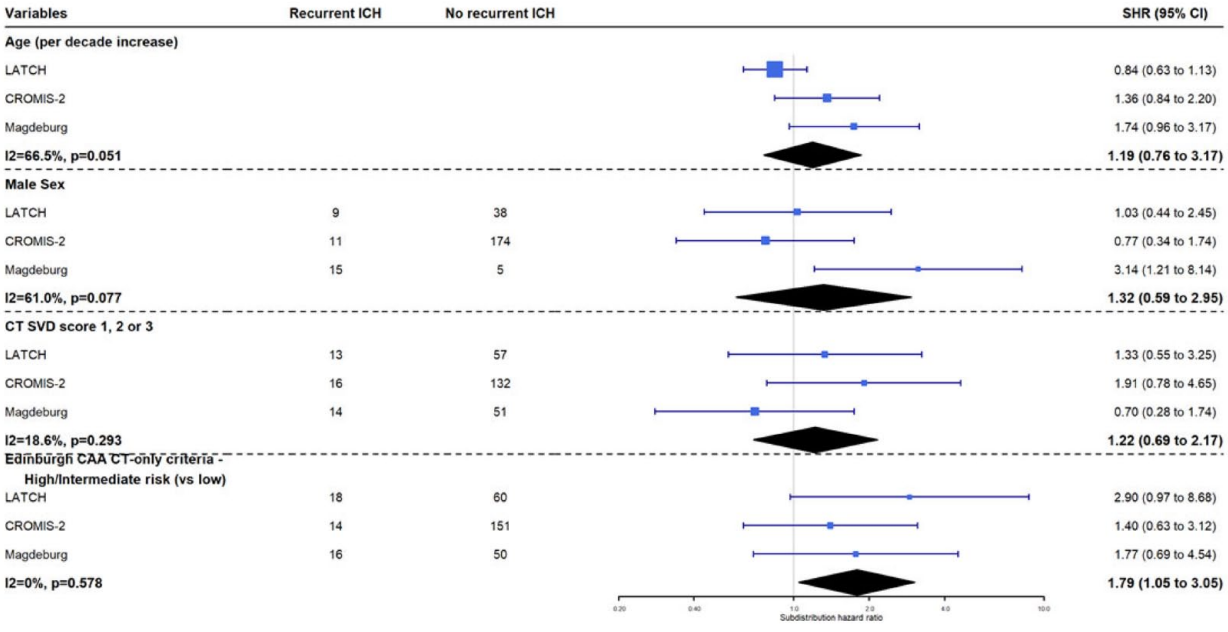
Background and aims: The association between the Edinburgh CT-only criteria for cerebral amyloid angiopathy (CAA)-associated lobar intracerebral haemorrhage (ICH) and recurrent ICH risk is unknown.

Methods: We included participants from eight ICH cohort studies (CROMIS-2, LATCH [UK], Magdeburg [Germany], Reggio Emilia [Italy], Graz [Austria], PITCH [France], ERICH and Boston [USA]) who survived ⩾30 days after spontaneous lobar ICH. Trained observers rated brain CT masked to clinical features and the primary outcome (recurrent ICH). We sought individual participant data and performed primary two-stage (cohort-level) and secondary one-stage (pooled) meta-analyses using multivariable regression with a competing risk of death, adjusted for age, sex and CT small vessel disease score. We also adjusted secondary analyses for prior ICH, dementia and hypertension, and cohort clustering.

Results: The primary analysis included 564 participants from three cohorts with first-ever lobar ICH. The intermediate/high probability Edinburgh CT-only CAA criteria had a higher risk of recurrent ICH compared with low probability (LATCH: 18/78 [23.6% five-year cumulative incidence rate] vs. 4/42 [9.8%], CROMIS-2: 14/165 [9.0% three-year cumulative incidence rate] vs. 11/177 [6.9%], Magdeburg: 16/66 [27.0% five-year cumulative incidence rate] vs. 6/36 [19.7%]; adjusted subdistribution hazard ratio [aSHR] 1.79 [95%CI 1.05-3.05], p=0.032; I^2 0%, p=0.578). Secondary meta-analysis of 1657 participants from eight cohorts showed a similar association between the intermediate/high probability Edinburgh CT-only CAA criteria compared with low probability (128/915 [20.0% five-year cumulative incidence rate] vs. 47/742 [11.9%]; aSHR 2.16 [95%CI 1.33-3.48], p=0.002).

Conclusions: The intermediate/high probability Edinburgh CT-only CAA criteria after lobar ICH are associated with recurrent ICH.

Disclosure of interest: No



O117/1713

Scientific Communication SC18 - SAH and ICH

THE NATURAL HISTORY OF PARENCHYMAL HAEMATOMA CLEARANCE AFTER INTRACEREBRAL HAEMORRHAGE AND ITS IMPACT ON FUNCTIONAL OUTCOME: PRELIMINARY RESULTS

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Background and aims: the dynamics and prognostic influence of parenchymal Haematoma Clearance after intracerebral haemorrhage (ICH) are under investigated. We aimed to quantify the parenchymal Haematoma Clearance and its impact on functional outcome.

Methods: prospectively collected, single-center cohort of consecutive patients with spontaneous ICH and Non-Contrast Computed Tomography scans available at baseline (T0), 24 hours (T1) and 7 days from onset (T7). ICH volumes (Vol) were calculated with semi-automated software. Relative parenchymal Hematoma Clearance, defined as [Vol(T1)-Vol(T7)]/Vol(T1), was quantified. The outcome of interest was good functional prognosis at 90 days, defined as modified Rankin scale 0-2, and its predictors were explored with logistic regression, accounting for confounders (FUNC score).

Results: 150 patients were included (median age 68 y.o. IQR 61-74, 47.3% males, median ICH baseline volume 12.4 mL, IQR 5.6-18.5) of whom 98 (65.3%) had good functional outcome. Median parenchymal Haematoma Clearance at T7 was 11.2% (min-max: 1.97-42.11%). Haematoma Clearance was higher in patients with good outcome (12.7% vs 7.9%, $p<0.001$) and inversely correlated with Vol(T1) (Rho=-0.706, $p<0.001$). Accounting for confounders, Haematoma Clearance remained independently associated with good functional outcome (OR=1.08, CI95% 1.016-1.152, per 1% clearance increase, p=0.015). However, this association was not linear, and the odds of good outcome were significantly increased only in patients in the fourth clearance quartile (parenchymal Haematoma Clearance$\geqslant$16%, OR=4.972, CI95% 1.283-19.261, p=0.020).

Conclusions: at T7, all patients experienced a partial parenchymal Haematoma Clearance. As a higher Haematoma Clearance was associated with good outcome, targeting Haematoma Clearance might be an interesting therapeutic strategy.

Disclosure of interest: No

O118/2347

Scientific Communication SC18 - SAH and ICH

WHITE MATTER HYPERINTENSITIES AND FUNCTIONAL OUTCOME PREDICTION AFTER MINIMALLY INVASIVE SURGERY FOR INTRACEREBRAL HEMORRHAGE

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Background and aims: Functional outcomes may vary by baseline brain imaging findings of small vessel disease in patients undergoing minimally invasive surgery (MIS) for intracerebral hemorrhage where efficacy and optimal patient selection remain controversial. We evaluated whether white matter hyperintensities (WMH) on CT and MRI modify the effect of MIS on functional outcomes.

Methods: We compared 2 visual WMH rating scales, van Swieten score (vSS) on CT and Fazekas scale (FZKS) on MRI, at enrollment in the MISTIE-III trial. We evaluated the severity of vSS and FZKS and tested for heterogeneity in the effects of all MIS and MIS with end-of-treatment (EOT) volume $\leqslant$15 mL on the trial's primary outcome of good functional outcome (mRS 0-3) at one year using multivariable models.

Results: Of 499 enrolled patients, 280 had WMH graded by both CT and MRI (40% women; median age, 62 years; IQR, 52-71). A moderate correlation was observed in paired comparisons of the 2 scales (Spearman's ρ=0.68, $P<0.0001$). In patients undergoing MIS and MIS+EOT ICH volume $\leqslant$15 mL, significant increase in odds of poor outcome was found with vSS$>$1 (adjusted OR, 7.92; 95%CI, 2.10-29.83; Pinteraction=0.002, and aOR, 12.59, 95%CI, 3.18-49.89; Pinteraction$<$0.001, respectively). Similar effect modification of WMH on functional outcomes was observed for FZKS$>$1, but only for patients with EOT volume $\leqslant$15mL.

Conclusions: Mild to moderate WMH on CT or MRI is associated with worse neurological outcomes in patients undergoing MIS for ICH. WMH may have utility for prognostication, and for patient selection in clinical trials.

Disclosure of interest: No

O119/594

Scientific Communication SC18 - SAH and ICH

COMPOSITE SMALL VESSEL DISEASE SCORES AND RISK OF RECURRENT STROKE, INTRACRANIAL HAEMORRHAGE AND DEATH: AN INTERNATIONAL MULTICENTRE VALIDATION STUDY

Jonathan Best*[1], Gareth Ambler[2], Duncan Wilson[1,3], Houwei Du[4], Keon-Joo Lee[5], Jae Sung Lim[6], Kay Cheong Teo[7], Henry Ka Fung Mak[8], Young Dae Kim[9], Tae-Jin Song[10], Derya Selcuk Demirelli[11], Masashi Nishihara[12], Masaaki Yoshikawa[13], Marta Kubacka[14,15], Annaelle Zietz[15,16], Rustam Al-Shahi Salman[17], Rolf Jäger[18,19], Gregory Lip[20,21], Leonidas Panos[22,23], Martina Göldlin[22,23], Lee-Anne Slater[24], Christopher Karayiannis[25], Thanh Phan[26,27], Maximilian Bellut[28], Jill Abrigo[29], Cyrus Cheng[30], Thomas Leung[30], Winnie Chu[29], Francesca Chappell[17,31], Stephen Makin[32], Julie Staals[33], Regis Bordet[34], Gregory Kuchcinski[34], Joanna Wardlaw[17,31], Yannie, Oi Yan Soo[30], Felix Fluri[28], Velandai Srikanth[35,36], Simon Jung[22,23], Nils Peters[14,15,16], Hideo Hara[13], Yusuke Yakushiji[13,37], Fethiye Dilek Orken[38], Ji Hoe Heo[9], Kui Kai Lau[7], Hee-Joon Bae[39], David Seiffge[22,23], David Werring[1]

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Background and aims: Cerebral small vessel disease (CSVD) is an important cause of intracranial haemorrhage (ICH) and ischaemic stroke (IS). Composite scores have been proposed to summarise the MRI burden of CSVD. We externally validated these in an international multicentre analysis.

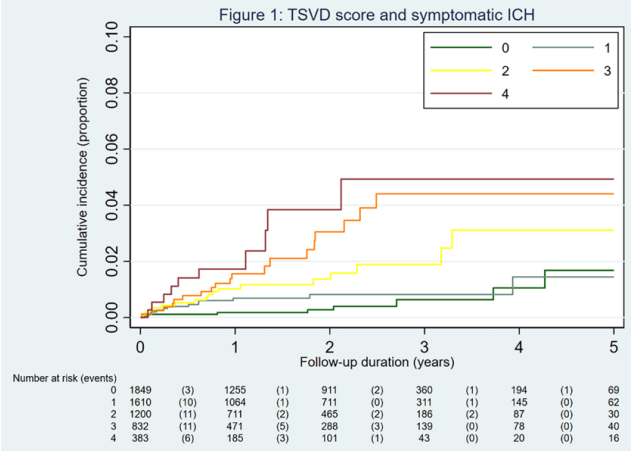
Methods: We pooled individual patient data from cohort studies of participants with recent ischaemic stroke or TIA, baseline MRI and follow-up for IS and symptomatic ICH. We calculated the Total Small Vessel Disease score (including microbleeds, white matter hyperintensities (WMH), basal ganglia perivascular spaces, and lacunes) and simplified four-point Cerebral Amyloid Angiopathy score (including lobar microbleeds, WMH, centrum semiovale perivascular spaces, and cortical superficial siderosis) for each participant. We assessed prognostic associations with ICH, IS, and mortality using Cox regression.

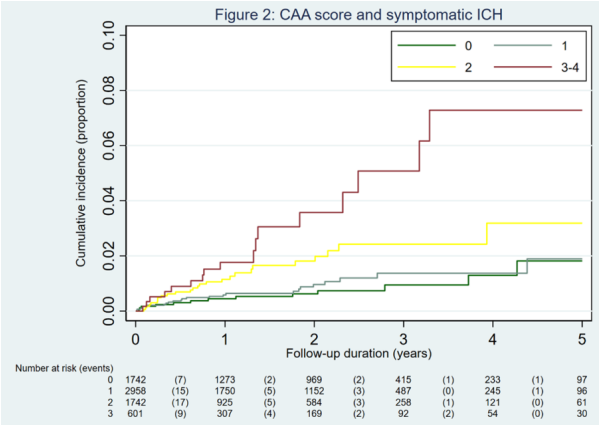
Results: 7,043 participants from 13 studies were available for validation of the CAA score and 5,874 participants from 8 studies for the TSVD score. 47.7% of participants were treated with oral anticoagulation at baseline, and 48.6% with an antiplatelet only. Both scores were significantly associated with incident ICH and mortality, but not incident IS (*Table 1*, *Figures 1* & *2*). In 5,656 participants with both scores available, the TSVD score showed numerically superior discrimination for ICH (c=0.70, 95% CI 0.64-0.76) to the CAA score (0.63, 0.56-0.70).

Conclusions: CSVD scores show moderate predictive value for ICH, but limited performance for ischaemic stroke and mortality, reflecting the close mechanistic link between CSVD and ICH. These findings emphasise CSVD as a cause of ICH in ischaemic stroke/TIA patients treated with antithrombotic drugs.

Table 1

		Hazard Ratio (95% CI)		
Predictor	**Value (n)**	**ICH**	**IS**	**Mortality**
TSVD score	0 (1,849)	1.00	1.00	1.00
	1 (1,610)	1.79 (0.73-4.38)	1.19 (0.87-1.61)	1.26 (0.83-1.90)
	2 (1,200)	3.63 (1.34-9.83)	1.54 (0.93-2.58)	1.87 (1.24-2.82)
	3 (832)	5.92 (2.13-16.4)	1.94 (1.19-3.18)	1.72 (1.13-2.61)
	4 (383)	7.60 (2.93-19.7)	2.11 (1.00-4.48)	2.25 (1.90-2.68)
	P value	<0.0001	0.096	<0.0001
	Mean follow-up (years)	1.82	1.79	1.83
	Events	66	348	898
CAA score	0 (1,742)	1.00	1.00	1.00
	1 (2,958)	1.28 (0.76-2.17)	1.09 (0.83-1.42)	1.06 (0.86-1.31)
	2 (1,742)	2.50 (1.42-4.39)	1.35 (0.92-1.97)	1.28 (0.88-1.85)
	3 (588)	4.54 (2.32-8.88)	1.56 (0.97-2.50)	1.29 (0.90-1.86)
	4 (13)	16.9 (4.16-69.0)	2.32 (0.33-16.4)	5.66 (3.40-9.42)
	P value	<0.0001	0.32	<0.0001
	Mean follow-up (years)	1.77	1.74	1.78
	Events	80	377	1023





Disclosure of interest: No

O120/2544

Scientific Communication SC19 - Prognosis and Outcome After Stroke

LOOKING BEYOND DISABILITY: SEX/GENDER DISPARITIES IN OUTCOMES AFTER STROKE

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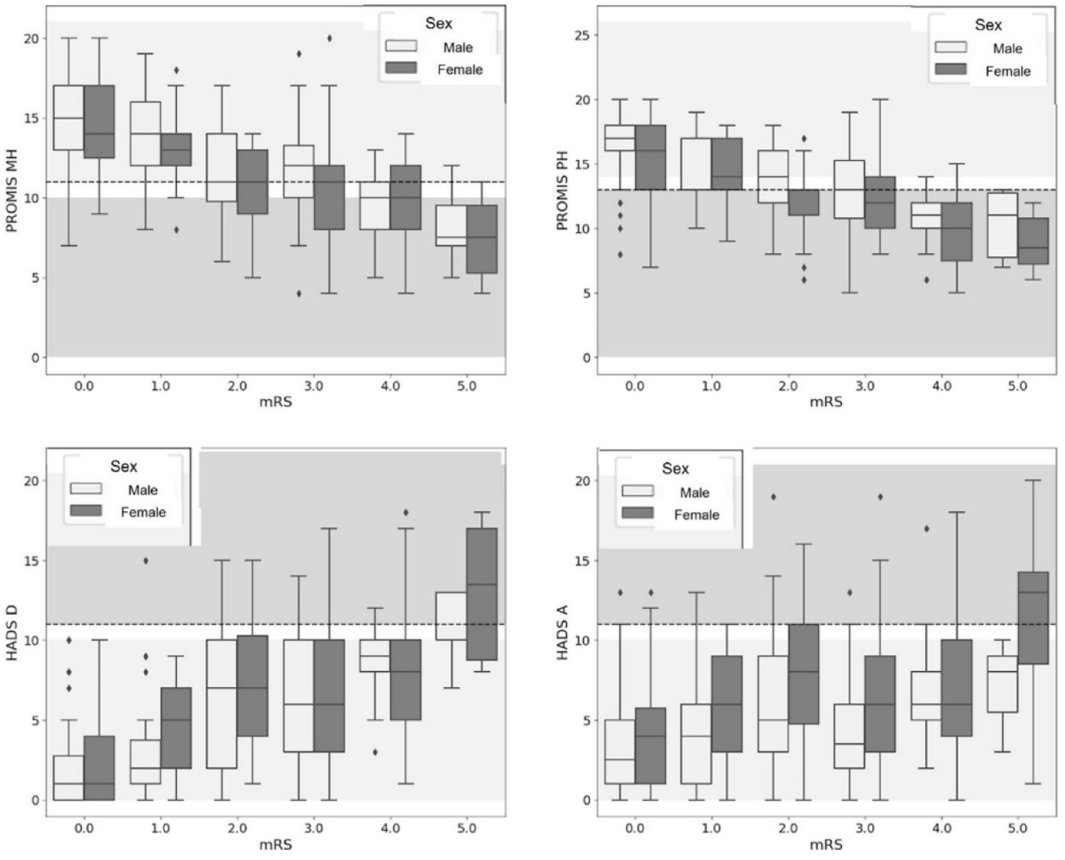
Background and aims: Sex/gender differences in stroke outcomes have been reported with conflicting results. Patient reported outcomes measures(PROMS) are key in value-based healthcare and may identify sex/gender disparities unnoticed by clinicians. We aimed to evaluate sex-focused outcomes after acute stroke.

Methods: Consecutive acute stroke patients admitted to 5 University Hospitals participating in HARMONICS (an EU-funded High-value Stroke care project in Catalonia) discharged home or to socio-rehabilitation centers were offered a harmonized multimodal digital follow-up by a PROMs-through-App program (NORA, NoraHealth Barcelona Spain). PROMs recollection at 7 and 90 days included: HADs (anxiety/depression), PROMIS-10 (global physical and mental health) and global health quality (GHQ 0-100). Additional outcomes included modified Rankin scale(mRS) at 3 months. Gender differences in outcomes were evaluated and adjusted by potential confounders.

Results: From 2020, 2268 patients followed the NORA program, 42.5% female, median age 74y. Women were older (78 vs 71y), had worse pre-stroke mRS (1 vs 0), baseline NIHSS (4 vs 3), and discharge/3months mRS (3 vs 2 both)($p<0.05$ for all). Females showed worse PROMS globally and for each mRS score (Figure). Logistic regression analysis adjusted by age, stroke severity and discharge mRS showed that female sex emerged as an independent predictor of most poor PROMs: PROMIS-physical: OR 2.4, IC 1.6-3.6; PROMIS-mental: OR 1.8, IC 1.2-2.8; HADs-anxiety: OR 2.3, IC 1.3-3.8; GHQ: 1.7, IC 1.1-2.5; $p<0.05$ for all.

Conclusions: Sex differences in outcomes reported by clinicians and patients were detected in our series. Whether specific interventions following sex or gender-perspective may reduce these disparities warrants evaluation.

Disclosure of interest: No



O121/1326

Scientific Communication SC19 - Prognosis and Outcome After Stroke

PREVALENCE OF FRAILTY IN A TIA CLINIC AND ASSOCIATION WITH MORTALITY

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Background and aims: Frailty is a clinical syndrome of increased vulnerability to stressors, associated with adverse outcomes after stroke, but its impact on outcomes after transient ischaemic attack (TIA) remains unclear.

Methods: Retrospective analysis of 1185 patients referred by the emergency department (ED) who attended TIA clinic with a Clinical Frailty Scale (CFS) score within two weeks. Records were combined from two routinely collected databases, and prevalence of frailty was determined. Frailty was classified as CFS score >/=4. Data were collected on date of death, and hazard ratios (HR) were determined through Cox proportional hazard regression, adjusted for prognostic factors.

Results: 7945 patients were referred through the ED between 01/01/2016 and 12/03/2022. 1185 patients were included. 53.5% (n=634) had frailty. Patients with frailty tended to be older (median age 81 vs 74 years, p<0.001) and female (53.9% vs 39.9%, p<0.001). TIA was diagnosed in 28.3% (n=335), 61.2% (n=205) of whom were frail. Stroke was diagnosed in 23.1% (n=274), 46.7% having frailty (n=128). In TIA patients and the whole study cohort (WC), frailty (TIA: HR 2.69 [95%CI 1.23-5.87, p=0.013], WC: 2.58 [95%CI 1.64-4.08, p<0.001]) and increasing age [HR 1.07 95% CI 1.04-1.12] were predictive of mortality. In stroke patients, only increasing age was predictive of mortality (HR 1.11 [95%CI 1.04-1.19, p=0.003]).

Conclusions: Frailty is common in TIA and is predictive of mortality. Studies are required to investigate the effects of frailty on other outcomes after TIA, including quality of life; progression to stroke; and the impact of frailty on rehabilitation strategies.

Disclosure of interest: No

O122/1419

Scientific Communication SC19 - Prognosis and Outcome After Stroke

MAJOR VASCULAR EVENTS AFTER STROKE: RESULTS FROM THE SOUTH LONDON STROKE REGISTER

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Background and aims: Survival after stroke has been improved in recent decade because of recent acute care advancements and improvements in vascular secondary prevention. We evaluate major vascular events after stroke and trends in the last 2 decades.

Methods: A population-based cohort study of patients of first stroke between 1995-2016 in South London, UK was analysed. Since having a recurrence or myocardial infarction post first stroke alters the risk of mortality, these events were analysed as semi-competing risks using the cumulative incidence function and Fine-and-Gray sub-distribution hazard model. The average percentage change (APC) in events' rates by year of first stroke were estimated utilizing join-point regression.

Results: A total of 5,359 incident strokes were registered. The rate of stroke recurrence in the first 5-year follow-up decreased significantly from 11% (95% CI 9.3%-12%) in 1995-1999 cohort to 8.3% (95% CI 6.9%-10%) in 2005-2009 (APC= -0.10% per year). The equivalent rates for other events are presented in Table1 and Figure1. A 32% increased risk of cardiovascular death was observed among survivors who had concomitant atrial fibrillation prior to the index stroke (sub-distribution hazard ratio (SHR)= 1.32, 95% CI 1.10-1.57) and a 36% decreased risk of a myocardial infarction for people of black ethnicity compared to white (SHR=0.64, 95% CI 0.43-0.96).

Conclusions: There has been a reduction in rates of cardiovascular related death and recurrence after stroke in a 5-year follow-up in the last 2 decades. Although the latter has plateaued in recent years, the rates of myocardial infarction and non-cardiovascular death surged.

Table 1: Cumulative Incidence* of 1st stroke recurrence, myocardial infarction, cardiovascular death, and non-cardiovascular death after stroke, by year of first stroke, % (95% Confidence Interval)

Year of 1st stroke	3-months	1-year	5-year
1st Stroke recurrence			
Overall	2.4 (2.0-2.8)	4.7 (4.2-5.3)	9.3 (8.5-10.0)
1995-1999	2.2 (1.5-3.0)	5.7 (4.7-6.9)	11 (9.3-12)
2000-2004	2.2 (1.5-3.1)	4.4 (3.4-5.6)	7.7 (6.3-9.2)
2005-2009	2.5 (1.7-3.5)	3.7 (2.8-4.9)	8.3 (6.9-10)
2010-2016	2.7 (1.9-3.7)	4.6 (3.6-5.9)	8.8 (7.3-10)
1st post-stroke myocardial infarction before recurrence			
Overall	0.4 (0.3-0.7)	1.6 (1.2-1.9)	4.0 (3.5-4.6)
1995-1999	0.1 (0.0-0.4)	0.4 (0.2-0.9)	0.9 (0.6-1.5)
2000-2004	0.5 (0.2-1.0)	1.3 (0.8-2.1)	4.6 (3.6-5.9)
2005-2009	0.3 (0.1-0.8)	1.4 (0.9-2.2)	4.5 (3.4-5.8)
2010-2016	1.0 (0.6-1.7)	3.3 (2.4-4.4)	6.0 (4.8-7.3)
Cardiovascular death before other events			
Overall	20 (18-21)	23 (22-24)	28 (27-30)
1995-1999	29 (26-31)	34 (31-36)	42 (39-44)
2000-2004	24 (21-26)	29 (26-31)	34 (32-37)
2005-2009	13 (11-15)	15 (13-18)	20 (18-22)
2010-2016	10 (8.8-12)	11 (9.8-13)	13 (11-14)
Non-cardiovascular death before other events			
Overall	3.2 (2.8-3.7)	5.9 (5.3-6.5)	17 (16-18)
1995-1999	1.9 (1.3-2.7)	3.6 (2.7-4.6)	13 (11-14)
2000-2004	2.4 (1.7-3.3)	5.4 (4.3-6.7)	13 (11-15)
2005-2009	4.6 (3.5-5.9)	7.5 (6.1-9.1)	19 (17-22)
2010-2016	4.3 (3.3-5.5)	7.7 (6.3-9.2)	21 (19-23)

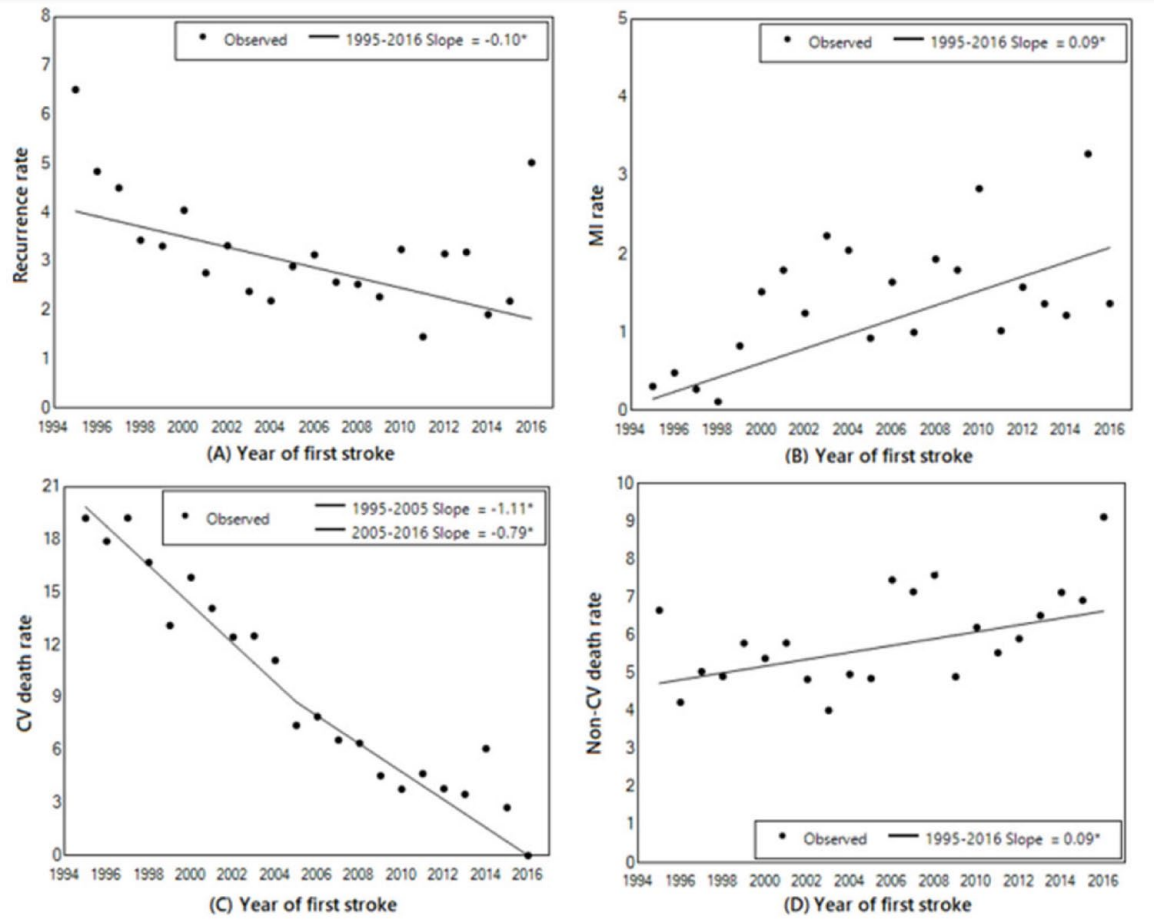

Figure 1: Trend of events' rates by year of first stroke with average percentage change (APC),
* Indicates P-value<0.05

Disclosure of interest: No

O123/1579

Scientific Communication SC19 - Prognosis and Outcome After Stroke

RECURRENT STROKE, CARDIOVASCULAR EVENTS AND DEATH 7-9 YEARS AFTER MINOR LACUNAR OR CORTICAL ISCHAEMIC STROKE: THE MILD STROKE STUDY 2 (MSS-2)

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Background and aims: Data on longitudinal outcomes of mild ischaemic stroke and small vessel disease are lacking. We report data on recurrent stroke, cardiovascular events, risk factors and death 7-9 years post lacunar or mild cortical ischaemic stroke.

Methods: We recruited patients within 3 months of non-disabling stroke (mRs ⩽2) and assessed sociodemographics, vascular risk factors, functional dependency (mRS), cognition and brain MRI. At 1, 3, and 7-9 years post-stroke, we used self, GP and central medical records to reassess adverse vascular events including recurring stroke, cardiovascular events, vascular risk factors and death.

Results: Of 264 participants recruited (at mean age 66.91[SD=11.84],41.7% female,44.7% lacunar), outcome data were available for 264 at 1 year, 246 at 3 years (16 declined,2 relocated) and 224 at 7-9 years (1 relocated; mean follow-up time= 8.5 years[SD=0.57]). In total, 63 (23.9%) participants died during the follow-up period (at mean age 79.7[SD=9.64],31.7% female,31.7% lacunar); 11 (4.2%) within 1 year,12 (5.1%) 2-3 years and 40 (18.9%) 4-9 years post-stroke, from malignancies (28.6%), vascular/cardiovascular causes (23.8%) and recurrent stroke/related complications (19%), respectively. In total, 85 (32.1%) participants had a recurrent stroke or TIA, 30 (11.4%) within 1 year, 21 (8.9%) 2-3 years and 34 (16%) 4-9 years post-stroke. During the follow-up period, 34 (12.8%) had a cardiovascular event, mostly MI (41.1%); since their initial stroke, 83 (31.4%) participants developed hypertension, 118 (44.7%) hyperlipidaemia, 34 (12.9%) diabetes and 58 (21.9%) AF.

Conclusions: Understanding the long-term impact of mild stroke is essential for directing clinical management and research priorities.

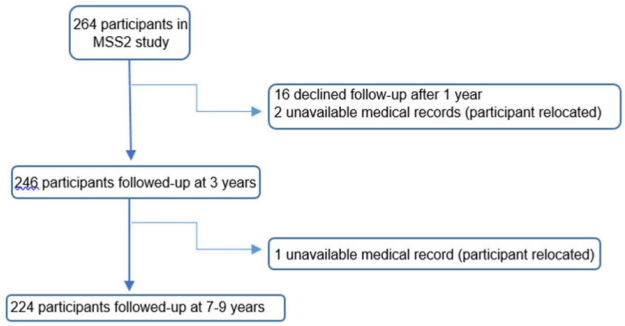

Figure 1. Data collection flow diagram.

Disclosure of interest: No

O124/1745

Scientific Communication SC19 - Prognosis and Outcome After Stroke

PREVALENCE AND PREDICTORS OF ADVERSE NON-MOTOR OUTCOME AFTER ENDOVASCULAR THROMBECTOMY AND THROMBOLYSIS FOR ACUTE STROKE

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Background and aims: Revascularisation with endovascular thrombectomy (EVT), intravenous thrombolysis (IVT) (or both) for hyperacute ischaemic stroke improves functional outcome on the modified Rankin Scale (mRS) but there are very few data on patient-reported non-motor outcomes. We investigated the prevalence and the predictors of non-motor outcomes in patients with ischaemic stroke treated with revascularisation at a comprehensive stroke center.

Methods: We included data from hospital registry which routinely collected non-motor outcomes at 6-month follow-up for patients admitted between 16th February 2017 to 30th November 2019 and treated with revascularisation. Non-motor outcomes were collected using the Patient-Reported Outcomes Measurement Information System-29 (PROMIS-29) and the Barthel Index. We used multivariable logistic regression analysis to identify predictors for each non-motor outcome.

Results: We included 642 patients; 382 received IVT, 153 patients received EVT, and 107 received both; the mean age was 71.0 and 279(43.5%) were female. There was no difference between groups pre-morbid mRS or NIH stroke scale score (NIHSS) at presentation, but at 6 months EVT group had lower mRS (median= 0, p= 0.003). Despite this, overall prevalence of non-motor outcomes across all groups were high, with most prevalent adverse non-motor outcomes being fatigue (52.96%), sleep disturbance (46.57%), and reduced social participation (49.38%). Age, high NIHSS, no support plan, and stroke recurrence were significant predictors of adverse non-motor outcome prevalence for multiple domains.

Conclusions: Adverse non-motor outcomes are common despite patients receiving time-critical revascularisation treatment, indicating an unmet clinical need; we identified predictors, which may be relevant for improving post-acute care pathways.

Disclosure of interest: No

O125/1439

Scientific Communication SC19 - Prognosis and Outcome After Stroke

IMPAIRED RECOVERY OF SURVIVING ISCHEMIC CAPILLARY PERICYTES PROMOTES NO-REFLOW DEVELOPMENT AFTER EXPERIMENTAL STROKE IN VIVO

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Background and aims: Pericytes regulate cerebral blood flow and are reported to impair microvascular flow after cerebral ischemia by dying while constricted around capillaries. However, *in vivo* evidence supporting this conclusion has remained elusive. Here, we used repetitive *in vivo* 2-photon microscopy to investigate whether pericytes survive ischemic stroke, constrict during ischemia, and are causally implicated in the no-reflow phenomenon upon reperfusion.

Methods: NG2dsRedxPDGFRbEGFP mice with fluorescent pericytes underwent transient middle cerebral artery occlusion or sham surgery and pericyte survival, vessel diameter, and cerebral blood flow were assessed after stroke using *in-vivo* 2-photon imaging, immunohistochemistry, laser-speckle imaging, and transcriptomic analyses.

Results: We show 87% of pericytes constrict during cerebral ischemia, remain constricted post-reperfusion and 50% of pericytes showing acute membrane damage. Moreover, we reveal ischemic pericytes are fundamentally implicated in capillary no-reflow by arresting blood flow within 24 hours post-stroke. Despite sustaining damage, we observe 80% of cortical pericytes recover and survive ischemia, upregulate unique transcriptomic profiles and replicate. Finally, we demonstrate delayed recovery of capillary diameter by ischemic pericytes after reperfusion predicts vessel reconstriction in the sub-acute phase of stroke.

Conclusions: In summary, our data show functional impairment of surviving pericytes dominates over cerebral pericyte death to mediate no-reflow following transient cerebral ischemia, Therefore, pericytes may represent a novel therapeutic target for the treatment of the no-reflow phenomenon after ischemic stroke.

Disclosure of interest: No

O126/863

Scientific Communication SC19 - Prognosis and Outcome After Stroke

INTERLEUKIN-6, C-REACTIVE PROTEIN, AND VASCULAR RECURRENCE RISK AFTER STROKE ACCORDING TO MECHANISTIC SUBTYPE: AN INDIVIDUAL PARTICIPANT DATA META-ANALYSIS OF 8,281 PATIENTS

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Joan Montaner[11,12,13,14], Annie Pedersen[7,8], Francisco Purroy Garcia[15,16], Peter Rothwell[10], Yuji Ueno[9], Cathie Sudlow[17,18], Mikel Vicente-Pascual[15,16], William Whiteley[17,19], Mark Woodward[5,20], Peter Kelly[1,3,21]

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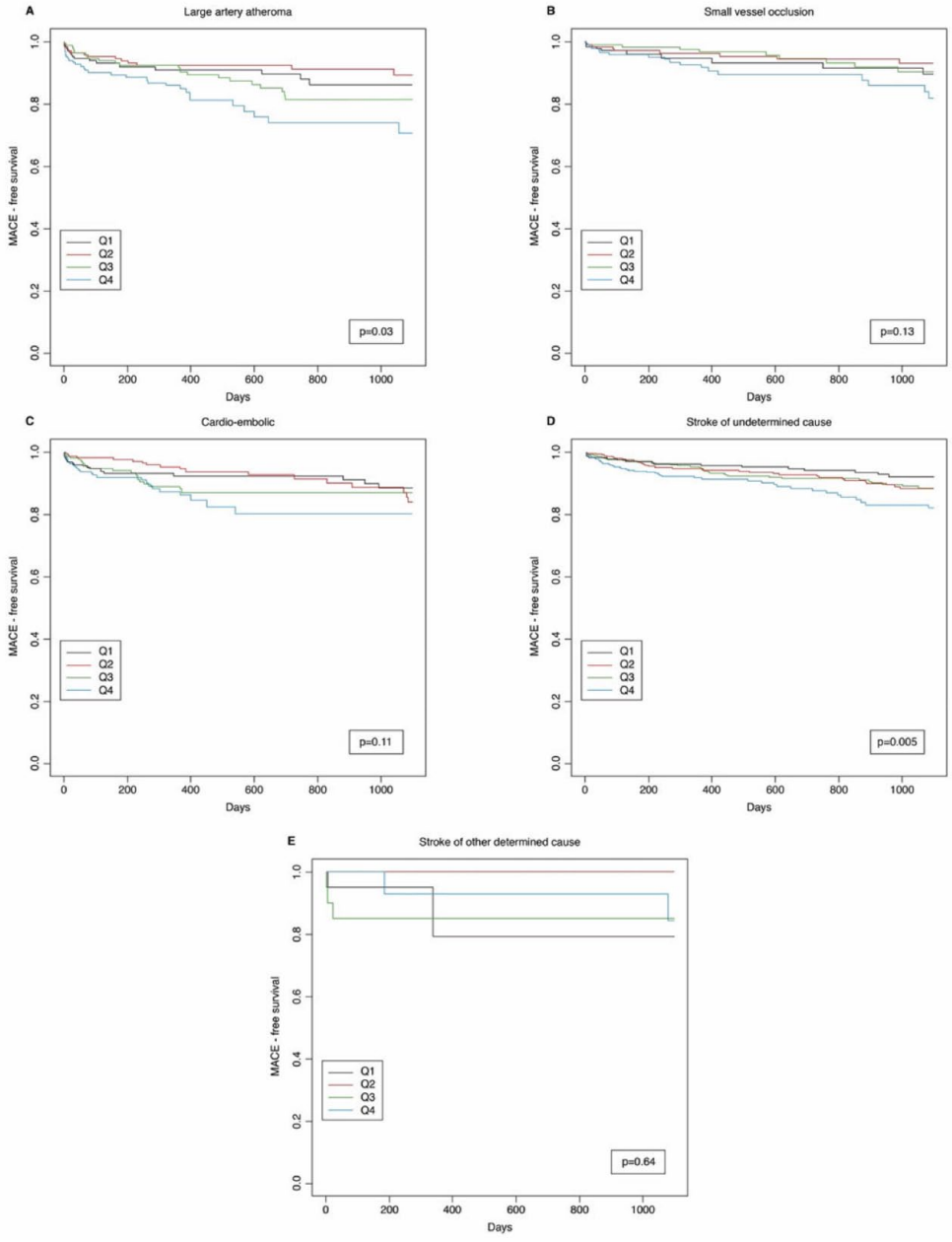
Background and aims: Randomised trials showed that anti-inflammatory therapies reduce major adverse cardiovascular events (MACE) in coronary disease, but are unproven in stroke. Interleukin-6 (IL-6) and



high-sensitivity C-Reactive protein (hsCRP) independently predict MACE and recurrent stroke after ischemic stroke. It is unknown if this association differs according to aetiological stroke subtype.

Methods: We investigated the association between hsCRP/IL-6 and MACE/recurrent stroke from individual-participant data of 8,281 patients (10 studies) with ischemic stroke/TIA. Analyses were performed according to stroke mechanism, per-quarter (Q4 v Q1) and per-unit increase in the biomarker after $\log_e$-transformation.

Results: After adjustment for risk factors and statins/anti-thrombotics, IL-6 independently predicted MACE in patients with large-artery atherosclerotic (risk ratio [RR] 2.30, 95% CI 1.21-4.36, p=0.01), cryptogenic (1.78, 1.19-2.66, p=0.005), and small-vessel (1.71, 0.99-2.96, p=0.05) stroke, but not cardiogenic (1.14, 0.61-2.14, p=0.69) or other subtypes (Q4 vs. Q1) (Figure 1). Consistent results were seen for recurrent stroke (Q4 vs Q1, large-artery RR 2.22, 1.14-4.33, p=0.02; cryptogenic, 1.65, 1.09-2.50, p=0.02; small-vessel, 1.66, 0.91-3.02, p=0.10), and when analysed per-unit increase for MACE (large-artery RR 1.26, 1.06-1.50, p=0.009; cryptogenic, 1.18, 1.04-1.34, p=0.01; small-vessel (1.22, 1.01-1.47, p=0.04). hsCRP was associated with MACE (RR 1.45, 1.04-2.03, p=0.03) in cryptogenic stroke, but no association was observed for other subtypes.

Conclusions: IL-6 was independently-associated with MACE/recurrent stroke in large-artery, small-vessel, and cryptogenic stroke. The results support the potential of IL-6 for personalised risk-stratification in clinical practice and to identify individuals at high inflammatory risk in key stroke subtypes for inclusion in future randomised trials of anti-inflammatory therapies.

Disclosure of interest: No

O127/326

Scientific Communication SC19 - Prognosis and Outcome After Stroke

EFFECT OF THE RNF213 P.R4810K VARIANT ON THE RECURRENCE OF ISCHEMIC STROKE -NCVC GENOME REGISTRY-

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Background and aims: Large-artery atherosclerosis (LAA) stroke is the predominant etiology of ischemic stroke (IS) in East Asia. We hypothesized that the *RNF213* p.R4810K variant, identified as a susceptibility gene for moyamoya disease, may affect the long-term recurrence of the ischemic event in IS patients.

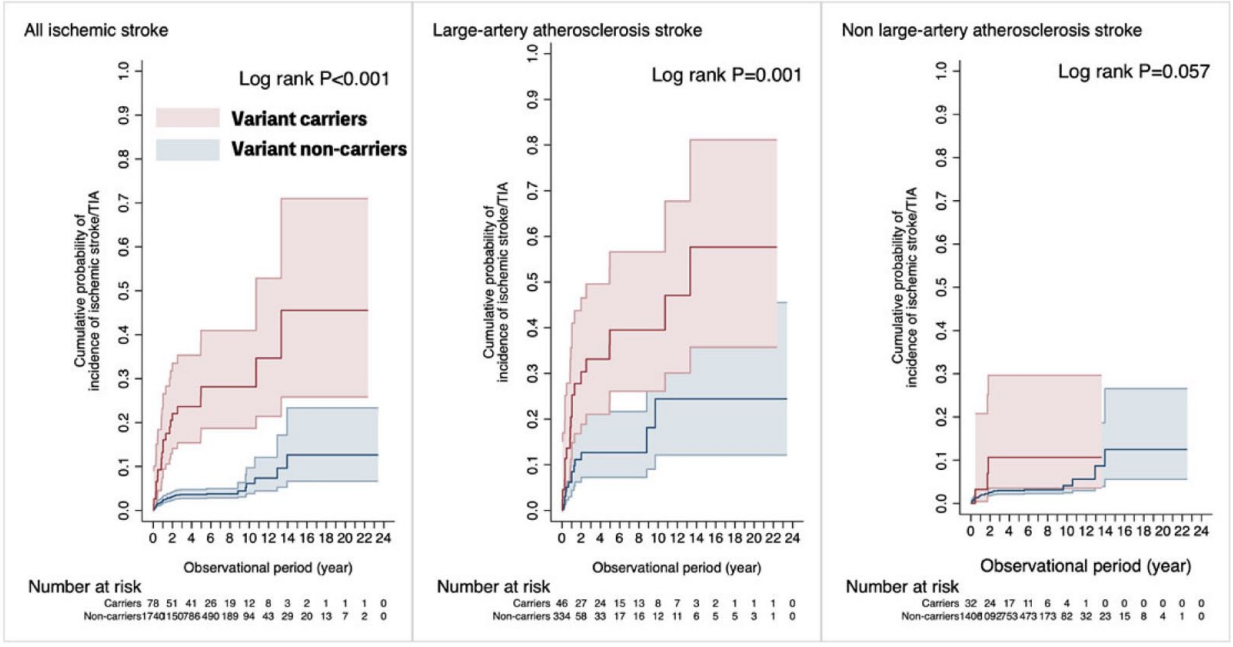
Methods: Patients with IS enrolled in the multicenter, observational National Cerebral and Cardiovascular Center GENOME Registry between 1998 and 2022, were divided into two groups; the *RNF213* p.R4810K variant carriages and non-carriages. The primary endpoint was the recurrence of IS/transient ischemic attack (TIA). Cox models were used to determine whether there was a difference in the hazard of endpoint in patients with/without the variant carriers.

Results: Among 1818 eligible patients, 78 (4.3%) had the *RNF213* p.R4810K variant. The median follow-up duration was 4.3 years. The *RNF213* p.R4810K variant carriages were younger than non-carriages (62 years vs. 74 years; P<0.001). Multivariate Cox regression analyses showed that age (hazard ratio [HR] per increasing 10 years, 1.22; 95% confidential interval [CI], 1.01–1.48) and the *RNF213* p.R4810K variant carriage (HR 8.65, 95% CI 4.76–15.72) were significantly associated with the recurrence of IS/TIA. When the analysis was limited to the LAA stroke patients (n=364), only the *RNF213* p.R4810K variant carriage (HR 3.87, 95% CI 1.61–9.33) was significantly associated with the recurrence of IS/TIA.

Conclusions: IS patients carrying the *RNF213* p.R4810K variant are at high risk for IS/TIA recurrence.

Disclosure of interest: Yes

Figure. **Kaplan-Meier curves for events in patients with/without the *RNF213* variant**



O128/1178

Scientific Communication SC20 - Stroke Complications & Outcome

HEMORRHAGIC TRANSFORMATION IN NON-CARDIOEMBOLIC ACUTE ISCHEMIC STROKE: MRI ANALYSIS OF PACIFIC-STROKE TRIAL

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Background and aims: In the phase 2 PACIFIC-Stroke trial, asundexian, a new oral anticoagulant targeting factor XIa, did not increase risk of hemorrhagic transformation (HT) in patients with acute non-cardioembolic stroke. In this secondary analysis, we aim to investigate the frequency, types, and risk factors of HT on brain MRI.
Methods: Patients with mild to moderate (NIHSS $\leqslant$15) non-cardioembolic ischemic stroke were randomly assigned to asundexian or placebo, in addition to guideline-based antiplatelet therapy. Brain MRIs were required within 96 hours of stroke onset. HT was defined by the Heidelberg classification by those unaware of treatment assignment.
Results: Of 1780 patients with adequate brain MRI, HT was detected in 497 (27.9%) patients. The majority were hemorrhagic infarction (HI1, 14.9%; HI2, 12.4%) while a few were parenchymal hematoma (PH1, 0.4%; PH2, 0.2%). The frequency of HT increased with longer onset-to-MRI interval ($<$12 h: 22.1%, 12–24 h: 23.0%, 24–48h: 25.1%, $>$48 h: 31.8%; $P_{trend} < 0.001$). In multivariable-adjusted model, male sex (OR 1.45, 95% CI 1.13–1.87), diabetes mellitus (1.35, 1.05–1.74), previous stroke (1.43, 1.05–1.96), higher NIHSS (1.08, 1.03–1.14), large ($>$ 15 mm) infarct size (3.54, 2.52–4.97), multiple diffusion restriction lesions (3.32, 1.70–6.47), any chronic brain infarct (2.55, 1.97–3.29), and any cerebral microbleed (1.28, 1.00–1.63) were associated with HT.
Conclusions: About 28% of non-cardioembolic stroke patients had detectable HT by MRI within 5 days of onset. Infarct size, stroke severity, and pre-existing brain lesions were associated with HT.
Disclosure of interest: No

O129/755

Scientific Communication SC20 - Stroke Complications & Outcome

ASSOCIATION OF PHYSICAL ACTIVITY TRAJECTORIES WITH FUNCTIONAL RECOVERY IN STROKE: A LONGITUDINAL SUBSTUDY OF THE EFFECTS TRIAL

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Background and aims: The optimum level and timing of post-stroke physical activity interventions to enhance functional recovery remain unclear. To identify physical activity trajectories over time and assess their association with functional recovery 6 months after stroke.
Methods: The study had a longitudinal, prospective design. All individual patient data were analyzed using the Efficacy of Fluoxetine–a Randomised Controlled Trial in 35 stroke and rehabilitation centers across Sweden. Physical activity was assessed at 1 week, 1 month, 3 and 6 months. The association of the identified distinct trajectories with functional recovery was assessed by adjusting the covariates.
Results: Of the 1,367 included patients (median [interquartile range] age, 72 years [65–79]; 523 female [38%]) in the longitudinal analysis, two distinct trajectory groups were identified (720 increasers [53%] and 647 decreasers [47%]). The increaser group showed a significant increase in activity level while being stable within light intensity from 1 week to 6 months, whereas the decreasers declined to inactive. Male patients and those with normal cognition had higher odds of being increasers, regardless of stroke severity. Increasing physical activity and sustaining it at light intensity was significantly associated with a good outcome at 6 months (adjusted odds ratio, 2.54 [99% confidence interval 1.72–3.75]; $P<.001$).
Conclusions: Increased physical activity and sustained light intensity during the subacute phase enhance functional recovery following stroke. Male patients and those with normal cognition have a higher probability of increasing or sustaining post-stroke physical activity, independent of stroke severity.
Disclosure of interest: No

O130/1371

Scientific Communication SC20 - Stroke Complications & Outcome

FUNCTIONAL LEVEL 3 MONTHS AFTER ISCHEMIC STROKE IS ASSOCIATED WITH LONG-TERM SURVIVAL

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Background and aims: The last decades patients with stroke have had an improvement in survival and functional level. Older studies have shown that the functional level 3 months after stroke influence long-time survival. Due to the improved prognosis for today's population, our primary aim was to investigate if there is an association between functional level at 3 months and survival at 3 years. Secondary we wanted to investigate whether other factors were important for long-term survival.
Methods: We used data from the Norwegian Stroke Registry (NSR). The study included 15360 patients recorded with ischemic stroke during the period 2015-2017 who had been independent in daily living (ADL) before stroke onset. The functional level was assessed with Modified Rankin Scale (mRS). Follow-up period was 3 years.
Results: A higher mRS score at 3 months was associated with poorer survival, and the risk of dying increased for increase in mRS score. Patients independent in ADL (mRS 0-2) had the best survival. After adjusting for prognostic factors in a multivariate cox regression, patients with mRS

scores 1, 2, 3, 4 and 5, respectively, had hazard ratios for death of 1.2, 1.8, 2.6, 4.7 and 9.0 compared to patients with mRS score 0. High age, the male gender, hypertension therapy and atrial fibrillation were significant risk factors of poorer survival.

Conclusions: Functional level assessed with mRS 3 months after an ischemic stroke is a strong predictor for 3-year survival. Independency in ADL three months after stroke is of great importance for prognosis and survival.

Disclosure of interest: No

O131/1863

Scientific Communication SC20 - Stroke Complications & Outcome

NEUTROPHIL ELASTASE AS A PREDICTIVE BIOMARKER FOR POST-STROKE INFECTION

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Background and aims: In-hospital infections are one of the main life-threatening complications in the subacute phase after stroke and increase hospitalization length. Therefore, identifying patients at risk of infection following stroke-induced immunosuppression is very important in order to improve outcomes. Neutrophil extracellular traps (NETs) are large networks released by neutrophils as an antimicrobial defence mechanism. However, NETs contribute to inflammation, immunothrombosis and tissue damage following stroke.

The goal of this study is to explore the role of NETs in the development of acute infections after ischemic stroke.

Methods: 389 ischemic stroke patients were recruited. Data regarding age, sex, cardiovascular risk factor, stroke etiology and severity (NIHSS) were collected. Patients were reassessed at 3 months to evaluate post-stroke mRS score. NETs markers were quantified by ELISA obtained upon admission. Data regarding infection was retrospectively retrieved from discharge records.

Results: 26.7% of patients suffered at least one infection during their hospitalization following ischemic stroke. Our results show that higher levels of the NET marker neutrophil elastase (NE) upon admission, correlate with the development of infections. Multiple logistic regression analysis was performed for predictors of infection and analyzing the ROC curves with different adjustments, we were able to correlate NIHSS, diabetes and NE with an AUC of 0.8035 (95% CI 0.749-0.858). Finally, to study the role of NE levels in predicting infection, a nested matched case-control analysis was performed

Conclusions: Our research would be a start point identifying patients at risk of infections to prompt early interventions and improve patient care.

Disclosure of interest: No

O132/1095

Scientific Communication SC20 - Stroke Complications & Outcome

PREDICTING POST-STROKE INFECTIONS USING A MACHINE LEARNING ALGORITHM

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Background and aims: Acute ischemic stroke (AIS) is a major cause of death and disability globally, and infections after stroke are linked to poor functional outcomes. While risk factors such as older age and being female have been identified, there is currently no reliable way to predict post-stroke infections. To address this, we used a machine learning algorithm to predict hospital-acquired infections (HAI, occurring more than 48 hours after admission with systemic antibiotics) in patients with AIS.

Methods: We analysed data from 13725 AIS patients in Chang Gung Research Database based on the International Classification of Diseases-9/10 and divided the patients into infection (n=6200) and non-infection (n=7525) groups. The infection group were further separated into community-acquired infection (CAI) (n=1689) and HAI groups (n=4511). From HAI and non-infection groups, we chose clinical information, laboratory results, and medication data as features to build a Random Forest model.

Results: After 25 cross-validations, the mean area under the curve (AUC) of the receiver operating characteristic curve was 0.89±0.01. Of 107 features, seven were identified as important for predicting post-stroke HAI, namely low-density lipoprotein, very low-density lipoprotein, glycated haemoglobin, modified Rankin Scale, speech function, and muscle strength of left and right lower extremities (Figure 1). When we utilised these seven features to build a new model, the AUC for predicting post-stroke infections was 0.86±0.01.

Conclusions: We developed a model using common features for predicting post-stroke infections, providing a new perspective on the mechanisms of these infections

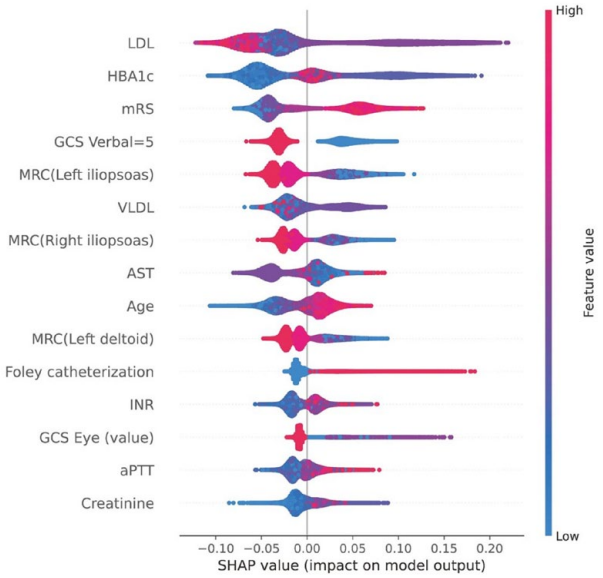

Figure 1. Shapley additive explanations (SHAP) values of features important for predicting hospital-acquired infection in patients with acute ischaemic stroke

Disclosure of interest: No

O133/1967

Scientific Communication SC20 - Stroke Complications & Outcome

RISK FACTORS FOR STROKE ASSOCIATED PNEUMONIA IN PATIENTS WITH SUSPECTED LARGE-VESSEL OCCLUSION: IMPLICATIONS OF DIRECT TRANSPORTATION TO THROMBECTOMY-CAPABLE CENTER VS

LOCAL STROKE CENTER. A SUB-ANALYSIS OF THE RACECAT TRIAL

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Background and aims: The risk of pneumonia in patients with suspected large vessel occlusion (LVO) has not been fully investigated regarding different transfer options. We aimed to assess whether pre-hospital factors such as transfer model, transfer-related complications, and travel time represent risk factors for pneumonia.

Methods: Secondary analysis of the RACECAT randomized clinical trial, which compared clinical outcomes between patients with suspected LVO directly transferred to thrombectomy-capable centres or local stroke centres. Pneumonia definition was suspected respiratory infection requiring antibiotics. Clinical information, risk factors, transfer modality, travel time, and transfer-related complications were compared regarding development of pneumonia. Independent risk factors for pneumonia were assessed by logistic regression. In addition, we performed a sensitivity analysis in patients with intracranial haemorrhage (ICH).

Results: Among all the 1,369 RACECAT patients, pneumonia was reported in 261 (19%), and in 84 out of 314 patients with ICH (27%). Transfer modality, pre-hospital time-metrics, and transfer complications were not associated with higher risk of pneumonia in the whole cohort. However, ICH patients directly transferred to comprehensive stroke centres had higher risk of pneumonia. In this subpopulation, the modality of transfer (OR 2.18, 95% CI 1.26 -3.75), male sex (OR 2.93, 95% CI 1.56-5.52), and RACE scale (OR 1.24, 95% CI 1.01-1.54) were independent predictors of pneumonia.

Conclusions: Pneumonia was not related to transfer protocol, travel time or complications in the entire RACECAT population. However, pneumonia was more prevalent in ICH, and direct transfer to a comprehensive stroke centre doubled the risk of pneumonia in ICH patients.

Disclosure of interest: No

O134/1942

Scientific Communication SC20 - Stroke Complications & Outcome

EVALUATION OF PHYSIOLOGICAL VARIABLES IN DETERMINING TIME TO MORTALITY AFTER STROKE ASSOCIATED PNEUMONIA

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Background and aims: Stroke-associated pneumonia (SAP) frequently complicates stroke and is associated with significant mortality. Clinicians often use physiological variables within the National Early Warning Score (NEWS) when diagnosing and prescribing antibiotics for SAP but little is known of its association with mortality. We investigated the relationship of the NEWS score and its components (including respiratory rate (RR), heart rate, temperature, oxygen requirement, oxygen saturation and alertness level) derived prior to antibiotic initiation, with time-to-mortality in SAP.

Methods: Data for patients with SAP (n=389) were extracted from a core dataset of stroke patients admitted to Manchester Centre for Clinical Neurosciences (2013-2021). Diagnosis of SAP was made if pneumonia occurred within 7 days of hospital admission. Kaplan-Meier survival curves were generated to assess parameters influencing survival at pre-defined time periods (1 year and 5 years). The association of these parameters on time-to-mortality were analysed using multivariable Cox regression models to account for a set of pre-specified potential confounders.

Results: The median age was 80y (71y-87y) and median NIHSS was 9 (IQR 4-17). Mortality within 1 year was 52.4% and 65.8% within 5 years. In the multivariable analyses, time-to-mortality was independently associated with respiratory rate (HR 1.04, 95% CI 1.01 to1.08, p=0.005) and total NEWS score (HR 1.17, 95% CI 1.10 to 1.23, p=<0.001).

Conclusions: In patients with SAP, respiratory rate and total NEWS score prior to antibiotic initiation were associated with survival. Further studies are warranted to identify potential opportunities for intervention and ultimately guide treatment to improve outcomes in SAP.

Disclosure of interest: No

O135/1408

Scientific Communication SC20 - Stroke Complications & Outcome

TRENDS IN THE PREVALENCE OF POST-STROKE DEPRESSION FROM 1995-2018: THE SOUTH LONDON STROKE REGISTER

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Background and aims: Functional post-stroke outcomes have improved with advances in acute treatment over recent decades, but the effects on mental health are unclear. We aimed to examine long-term trends in prevalence of post-stroke depression during 1995-2018.

Methods: The study was based on South London Stroke Register (SLSR) in 1995-2018. Prior-stroke depression diagnoses were collected from GP/hospital record, with 3-month and annual follow-up depressive symptoms assessed using the Hospital Anxiety and Depression Scale. The 24-year analysis was split into six four-year periods for trend smoothing. Logistic regressions were selected to estimate changes for six-period depression comparing 2015-2018 with 1995-1998, repeated for periodic changes in age, gender, ethnicity and prior-stroke depression subgroups, and to estimate variations for the four factors in the trend adjusted by time.

Results: Of the 6687 patients registered in SLSR, 81.16 % were aged 56 and over, 48.59% were female, 65.59% were White, and 8.54% had pre-stroke depression. The overall trend increased non-significantly comparing 2015-2018 and 1995-1998 (OR 1.20, 95%CI 0.94-1.53). Trends were

similar across different age, gender and pre-stroke depression groups (OR >1.14, p >0.1) except for different ethnicity, but none of them were significant. Across all cohorts the prevalence was higher for female (OR 1.11, 95%CI 1.02-1.21), non-white patients (e.g., Black: OR 1.14, 95%CI 1.04-1.26) and patients with pre-stroke depression (OR 1.66, 95%CI 1.45-1.90).

Conclusions: The was a slight and non-significant increase in the prevalence of post-stroke depression over the 24 years, despite concurrent improvement in stroke treatment. This was similar across all population groups.

Disclosure of interest: No

O136/470

Scientific Communication SC21 - Rare Causes, Stroke in the Young

DEVELOPMENT OF PREDICTION MODELS FOR EARLY AND LATE RECURRENT VASCULAR EVENTS IN YOUNG STROKE

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Background and aims: Accurate identification of young stroke patients at high risk of recurrence could help target secondary prevention strategies. Current models fail to adequately predict risk of recurrence, possibly because they do not take timing of recurrence into account. We aim to develop separate prediction models for early and late recurrences after ischemic stroke at young age.

Methods: The prospective multicenter ODYSSEY study included patients aged 18-50 years old between 2013-2021, with first-ever imaging-proven ischemic stroke. We performed multivariable Cox-regression analyses to identify predictors of recurrent vascular events (stroke, acute coronary syndrome, revascularization procedure or vascular death), separately for early (<1 month) and late (>1 month-5 years) recurrence. We assessed performance of both models with the c-statistic.

Results: 141 of 1216 patients had one or more recurrent vascular event (mean age all patients: 41.8 years, 52% male). The predictors for early recurrence (n=51) were large artery disease and dissections, while for late recurrence (n=100) we identified older age, ⩾2 vascular risk factors, large artery disease, small vessel disease and cardioembolic source. The c-statistic was 0.62 (95% CI=0.55-0.68) and 0.64 (95% CI=0.58-0.69) for the early and late recurrence model respectively. Discriminatory ability decreased when either models were used to predict early and late events combined (0.54 (CI=0.50-0.58) and 0.58 (CI=0.53-0.63)).

Conclusions: Etiology is an important predictor of recurrent vascular events in young stroke patients and differs according to timing of recurrence. This study highlights the imperativeness of separate prediction models for early and late recurrences.

Disclosure of interest: No

O137/1098

Scientific Communication SC21 - Rare Causes, Stroke in the Young

BENEFITS OF A PEDIATRIC STROKE CODE PROTOCOL IN A REGIONAL HEALTH SYSTEM: THE CATALAN EXPERIENCE

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Background and aims: Pediatric stroke is relatively rare and unrecognized. We aim to present the experience after 3 years of implementation of a Pediatric Stroke Code (PedSC) protocol at a regional level in Catalonia.

Methods: PedSC protocol was implemented in 2020 for children (29 days-18 years), based on the adult SC including modifications appropriate for pediatric care. The Catalan pediatric stroke network includes 6 primary stroke centers and 1 comprehensive stroke center 24/7. Identification and transfer of children with suspected stroke is managed by the Emergency Medical Services. Patents were prospectively registered in the Catalan Stroke Code registry (CICAT).

Results: A total of 218 children with acute stroke suspicion were attended during 3 years, corresponding to 6.6 cases/100.000 inhabitants: mean age 10 (SD 4.9) years, 97 (44%) girls, median time from onset to arrival at the specialized hospital 111 (IQR, 56-331) minutes, median Ped-NIHSS 5 (IQR, 2-14). Final diagnostic was ischemic stroke in 48 patients (22.0%), intracranial hemorrhage in 44 (20.2%) and stroke mimic in 126 (57.8%), the most frequent non-vascular diagnoses being migraine (16.5%) and seizures (16.1%). Large vessel occlusion was observed in 17% and reperfusion therapy was administered to 13% of children with ischemic stroke (2 intravenous thrombolysis and 4 mechanical thrombectomy). From those children with intracranial hemorrhage, 32% received acute neurosurgery intervention.

Conclusions: The implementation of a regional pediatric stroke code protocol enables timely acute care and reperfusion treatment. A high percentage of non-vascular conditions that simulate a stroke stands out.

Disclosure of interest: No

O138/727

Scientific Communication SC21 - Rare Causes, Stroke in the Young

PREDICTORS OF RELAPSE IN ADULT PATIENTS WITH PRIMARY ANGIITIS OF THE CENTRAL NERVOUS SYSTEM

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Background and aims: Identifying patients with primary angiitis of the central nervous system (PACNS) at higher risk of relapse may help guide treatment decisions. We sought to identify predictors of relapse using an international, multicenter retrospective observational cohort of PACNS patients.

Methods: Adults with PACNS who were treated and achieved remission (no clinical and radiological activity for 3 months) were included and followed until a first relapse, death or month 60. A relapse was defined as new clinical and imaging manifestations secondary to PACNS that occurred after remission and led to a change in treatment or death. Data were analyzed using the Kaplan-Meier method and Cox regression.

Results: 181 PACNS patients were included. A biopsy was positive in 52/89 patients. The median follow-up in patients without a relapse was 52 months (IQR: 24-60). The proportions of patients that relapsed were 12.4% (95% CI: 7.4-17.1) and 30.8% (22.7-38.0) at 1 and 5 years, respectively. In univariable analyses, findings associated with relapses were leptomeningeal or parenchymal gadolinium enhancement (HR: 2.69, 95% CI: 1.48-4.89), pseudotumoral presentation (2.59,1.15-5.83), absence of intracranial stenosis (2.29,1.28-4.11), absence of acute infarct (2.21,1.24-3.93), absence of focal neurological symptoms (2.19,1.06-4.54), and ⩾1 microbleed (1.93,1.06-3.63). After adjusting for these variables, the risk of relapse was decreased in patients undergoing induction with cyclophosphamide or rituximab versus corticosteroids alone (aHR: 0.30, 95% CI: 0.16-0.55).

Conclusions: Baseline findings may help identify PACNS patients at higher risk of relapse. Induction with cyclophosphamide or rituximab may be independently associated with a decreased risk of relapse.

Disclosure of interest: No

O139/630

Scientific Communication SC21 - Rare Causes, Stroke in the Young

RECURRENT ISCHEMIC EVENTS AFTER STROKE DUE TO CERVICAL ARTERY DISSECTION

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Background and aims: Cervical artery dissection is a leading cause of stroke in young adults. The risk of recurrent ischemic events is generally thought to be low, but reliable epidemiological data from prospective, well-phenotyped populations are scarce.

Methods: We studied patients with imaging-proven ischemic stroke due to cervical artery dissection included in the prospective ODYSSEY study. Patients were followed-up for a median of 3.9 years (IQR 2-5.9). We assessed risk of early (within 14 days) and late (beyond 14 days) recurrent TIA or ischemic stroke. Next, we assessed risk of recurrence among patients who discontinued antithrombotic therapy in the post-acute phase.

Results: 143 patients (mean age 41 years, 43% female) had stroke due to cervical artery dissection (59% carotid artery, 41% vertebral artery). Eighteen patients had a recurrent ischemic event (14 ischemic stroke, 4 TIA); median time to recurrence was 5 days (IQR 2-9). 89% were treated with any antithrombotic therapy prior to recurrence. The risk of recurrence was 10.5% (5.3-15.4%) within 14 days. Risk declined with follow-up and was 0.8% (0.0-1.5%) per year beyond 14 days. 94% used antiplatelet therapy at discharge, 3% oral anticoagulants. 81 patients (57%) stopped antithrombotic therapy during follow-up (median time to discontinuation 216 days (IQR 179-425)). There were no recurrent ischemic events during 212 person-years of follow-up without antithrombotic therapy.

Conclusions: The early risk of recurrent ischemic stroke after cervical artery dissection is high, despite initiation of antithrombotic therapy. Long term risk of recurrent events is low, also in patients who discontinued antiplatelet therapy.

Disclosure of interest: No

O140/1070

Scientific Communication SC21 - Rare Causes, Stroke in the Young

LONG-TERM RISK OF CEREBROVASCULAR EVENTS AFTER PATENT FORAMEN OVALE CLOSURE: RESULTS FROM A REAL-WORLD STROKE COHORT

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Background and aims: Patent foramen ovale (PFO)-closure is recommended for stroke prevention in selected patients with suspected paradoxical cerebral embolism. However, studies on cerebrovascular event recurrence after PFO-closure are limited by relatively short follow-up periods and information on the etiology of recurrent events are scarce.
Methods: All consecutive patients who had undergone PFO-closure at the University Hospital Graz from 2004-2021 were retrospectively identified. Indication for PFO-closure (with usage of different devices) was based on a regular neurological-cardiological PFO-board meeting. Patients underwent standardized clinical and echocardiographic follow-up 6 months after PFO-closure. Recurrent (cerebro)vascular events were assessed via electronical health records.
Results: Over the study period, PFO-closure was performed in 515 patients (ischemic stroke: n=506; TIA: n=9; mean age: 47.5±11.1 years; Amplatzer PFO-occluder: 48%). Only one patient had a major post-interventional complication (device thrombosis). Over a mean follow-up of 9.6 years, recurrent cerebrovascular events were observed in 34 patients (6.6%; ischemic stroke: n=22, TIA: n=12); five patients had myocardial infarction and one peripheral arterial embolism. While large- and small-vessel disease were the most frequent etiologies of recurrent stroke/TIA (26 and 23% respectively), only three strokes were related to atrial fibrillation (9%). Of note, no residual shunts were identified in patients with recurrent stroke/TIA.
Conclusions: In this long-term follow-up-study of stroke patients that had received PFO-closure with different devices in a real-world setting recurrent strokes were mainly related to macro- and microangiopathic causes. Thorough vascular risk factor control is crucial for secondary stroke prevention in patients treated for suspected paradoxical embolism.
Disclosure of interest: No

O141/2487

Scientific Communication SC21 - Rare Causes, Stroke in the Young

ENDOVASCULAR TREATMENT IN PATIENTS WITH CEREBRAL VENOUS THROMBOSIS – RETROSPECTIVE ANALYSIS OF SAFETY AND EFFICACY

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Background and aims: Anticoagulation is the standard treatment for cerebral venous thrombosis (CVT). The benefit of endovascular treatment (EVT), which promotes early venous recanalization, was assessed in a single randomized controlled trial (TO-ACT) that was prematurely terminated due to futility. We aimed to describe the safety and efficacy of EVT in selected patients with CVT.
Methods: Retrospective analysis of consecutive patients with CVT admitted to a tertiary center between 01/2011 and 08/2021.
Results: From 138 patients with diagnosis of CVT, 40 (29%) received EVT (85,0% were females, and mean age was 42±15,8 years). Most patients were selected for EVT after clinical worsening under anticoagulation (n=33; 82,5%). Before EVT, 5 patients presented in coma (12,5%), 32 with focal neurological deficits (80%) and 33 had parenchymal brain lesion (82,5%). In most cases, EVT consisted in mechanical thrombectomy combined with local fibrinolysis (87,5%). Total or partial recanalization of all thrombosed sinuses was achieved in 37 patients (92,5%). Two patients had an access-site hematoma. Clinical and/or imaging deterioration was observed in 19 patients (47,5%) after EVT, including new or enlarged parenchymal hemorrhage in 3 cases (7,5%). At 6 months, 76.3% (29/38) patients were functionally independent (mRS<3). The overall in-hospital mortality rate was 3,6% (5/138).
Conclusions: Recanalization of thrombosed sinuses through EVT was efficiently achieved, bearing a small risk of complications. Most patients were selected for EVT after clinical deterioration under anticoagulation.
Disclosure of interest: No

O142/1456

Scientific Communication SC21 - Rare Causes, Stroke in the Young

CEREBRAL VENOUS THROMBOSIS AND AUTOIMMUNE DISEASE

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Background and aims: Autoimmune disease (AD) increases the risk of cerebral venous thrombosis (CVT). We investigated frequency and type of AD among CVT patients and assessed their association with functional outcome.
Methods: We included consecutive CVT patients from the International CVT Consortium centers. Clinical presentation and presence of AD was recorded during the acute phase, and outcome was assessed at last available follow-up using the modified Rankin Scale (mRS).
Results: Data were available for 1,505 CVT patients from 16 centers and mean follow-up was 6.5 months. Any AD was present in 261 (17%)

Table 1

	No AD[1] (n=1279)	Behçet's disease (n=76)	Hypo-thyreosis (n=69)	IBD[2] (n=36)	MS[3] (n=11)	Psoriasis (n=11)	T1D[4] (n=9)	RA[5] (n=9)
Female Sex	820 (55)	22 (29) <0.001	59 (86) <0.001	25 (36) 0.442	9 (82) 0.201	7 (64) 0.949	3 (33) 0.061	6 (67) 0.823
Age, mean (±SD)	44 (6)	29 (11) <0.001	54 (17) <0.001	36 (13) 0.018	38 (10) 0.335	63 (13) 0.001	51 (14) 0.150	53 (19) 0.128
Headache	1043 (82)	75 (99) <0.001	47 (69) 0.069	30 (83) 0.934	10 (91) 0.737	8 (73) 0.751	5 (56) 0.110	7 (78) 0.929
Focal symptoms	683 (46)	11 (15) <0.001	40 (59) 0.716	21 (58) 0.760	4 (40) 0.725	8 (73) 0.452	2 (22) 0.188	5 (56) 0.980
Seizures	396 (27)	5 (7) <0.001	22 (32) 0.284	11 (31) 0.933	5 (50) 0.164	3 (27) 0.791	2 (22) 0.613	0 (0) 0.048
Coma	95 (6)	0 (0) 0.055	4 (6) <0.001	2 (6) 0.926	1 (9) 0.962	1 (9) 0.978	1 (11) 0.890	0 (0) 0.718
Mode of onset (p-value)		<0.001	0.737	0.022	0.034	0.498	0.139	0.425
Acute, 0-2 days	286 (22)	9 (12)	19 (30)	11 (38)	3 (27)	3 (30)	0 (0)	4 (50)
Subacute, 2-30days	587 (44)	32 (42)	35 (55)	18 (62)	2 (18)	3(30)	8 (89)	3 (38)
Chronic, >30 days	238 (21)	26 (34)	9 (14)	0 (0)	6 (55)	4 (40)	1 (11)	1 (13)
Parenchymal lesions	573 (45)	5 (7) <0.001	31 (45) 0.882	19 (53) 0.006	2 (18) 0.228	10 (90) 0.012	3 (33) 0.812	2 (22) 0.449
Hemorrhagic lesions	388 (26)	3 (4) <0.001	18 (26) 0.559	12 (33) 0.011	2 (18) 0.704	5 (46) 0.568	2 (22) 0.883	2 (22) 0.902
Good outcome (mRS[6] 0-2)	1035 (83)	74 (100) <0.001	49 (72) 0.026	31 (87) 0.434	11 (100) 0.143	5 (46) 0.001	7 (78) 0.624	7 (78) 0.609
Mortality	101 (8)	0 (0) 0.010	8 (12) 0.484	1 (3) 0.257	0 (0) 0.327	1 (9) 0.902	2 (22) 0.113	2 (22) 0.106
VTE[7] recurrence	35 (4)	5 (7) 1.000	2 (5) 0.109	4 (17) 0.015	0 (0) 1.000	1 (13) <0.001	0 (0) 1.000	0 (0) 1.000

Other diagnosed autoimmune diseases:
Vasculitis (n=8), Hypertyreosis (n=8), Systemic lupus erythematosus (n=8), Sarcoidosis (n=7), Autoimmune hemolytic anemia (n=7), Ankylosing spondyloatrhropathy (n=3), Polymyalgia rheumatica (n=3), Sjögren syndrome (n=3) Biliary chirrosis (n=2), Autoimmune hepatitis (n=2), Immune thrombocytopenic purpura (n=4), Rheumatic fever (n=1), Myasthenia (n=1), IgG4 disease (n=1), Reiter's disease (n=1), unspecified rheumatic disease (n=1)

1 Autoimmune disease, 2 Inflammatory bowel disease, 3 Multiple sclerosis, 4 Diabetes type1, 5 Rheumatoid arthritis, 6 modified Rankin Scale, 7 Venous thromboembolism

patients, with hypothyroidism, Behçet's disease, and inflammatory bowel disease (IBD) being the most frequent (Table 1). There was great variability in patient age, sex, disease course, and outcome between individual ADs. Patients with Behçet's had often CVT presentation with isolated headache symptom. In contrast, patients with psoriasis and IBD had more frequently focal symptoms and parenchymal lesions than CVT patients without AD (Table 1). Recurrence of venous thromboembolism (VTE) amongst IBD patients was elevated (17% vs. 4%). Behçet's disease was independently associated with good functional outcome (mRS 0-2) in logistic regression analysis (adjusted for age, sex, and center).

Conclusions: About one in 6 CVT patients has an AD. Autoimmune diseases represent a heterogeneous group regarding clinical presentation and outcome. Behçet's disease is associated with good outcome, whereas patients with IBD and psoriasis represent a group with a higher risk for CVT with focal symptoms and parenchymal lesions, and VTE recurrence.

Disclosure of interest: No

O143/1658

Scientific Communication SC21 - Rare Causes, Stroke in the Young

SEX DIFFERENCES IN CEREBRAL VENOUS SINUS THROMBOSIS AFTER ADENOVIRAL VACCINATION AGAINST COVID-19

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Background and aims: Cerebral venous sinus thrombosis associated with vaccine-induced immune thrombotic thrombocytopenia (CVST-VITT) is a severe disease with high mortality. The aim of our study is to investigate the differences in presentation, clinical course, treatment, and outcome of CVST-VITT in women and men.

Methods: We used data from an ongoing international registry. VITT was diagnosed according to Pavord criteria. We compared the characteristics of CVST-VITT between women and men.

Results: Of 133 possible, probable and definite CVST-VITT cases included in this analysis, 102 (77%) were women. Women were slightly younger (median age 42 (IQR 28-54) vs 45 (IQR 28-56)), more often were comatose at baseline (26% vs 10%) and had a lower platelet count at presentation [median (IQR) 50 (28-79) vs 68 (30-125)] as compared to men. The nadir platelet count was lower in women [median (IQR) 34 (19-62) vs. 53 (20-92)]. More women were treated with endovascular thrombectomy than men (15% vs 6%). Treatment with IVIG was similar (63% vs 66%), as were new thromboembolism (14% vs 14%) and major bleeding complications (36% vs 27%). Good functional outcome (modified Rankin Scale 0-2, 42% vs 45%) and in-hospital death (39% vs 41%, *P*=0.79) did not differ.

Conclusions: Three quarters of CVST-VITT patients in this study were women. Women were more severely affected at presentation, but clinical course and outcome did not differ in women and men. Rate of treatment with IVIG was similar, but more women were treated with endovascular thrombectomy.

Disclosure of interest: Yes

O144/1018

Scientific Communication SC22 - Intracerebral Hemorrhage

RAPID, INTENSIVE, AND SUSTAINED BP REDUCTION ASSOCIATES LOWER HEMATOMA EXPANSION, BETTER CLINICAL COURSE AND IMPROVED OUTCOMES IN PATIENTS WITH ACUTE ICH

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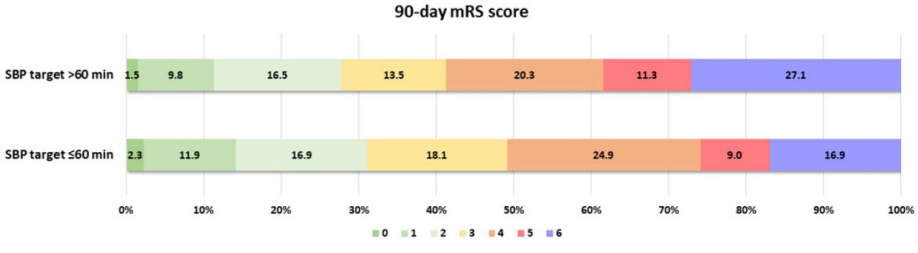
Background and aims: Time to achieve BP control may play a key role in the potential benefit of BP reduction strategies in acute ICH. This study aimed to evaluate the influence of time to SBP target achievement on ICH outcomes.

Methods: RAINS was a multicenter, prospective, observational cohort study of consecutive ICH patients <6 hours and SBP ⩾150 mmHg (January-2018, June-2022). Patients underwent baseline and 24-hour CT scans and 24-hour close noninvasive BP monitoring. BP was managed under a RApid (reaching target <60 minutes), INtensive (target SBP <140 mmHg), and Sustained (bolus followed by continuous perfusion) protocol. 24-hour SBP variability was also recorded. Outcomes included substantial hematoma expansion (>6mL->33%, primary outcome), early neurological deterioration (END, 24-hour ΔNIHSS ⩾4), and 90-day mRS score. Analyses were adjusted by age, sex, anticoagulation, onset-to-imaging time, ICH volume, and intraventricular extension.

Results: We included 313 patients: 178 (56.9%) achieved SBP target <60 minutes and median 24-hour SBP variability was 21.1 (15.6-25.0) mmHg. SBP target achievement <60 minutes halved the risk of substantial hematoma expansion (aOR 0.48, 95% CI 0.27-0.85), END (aOR 0.51, 95% CI 0.28-0.91), and worse 90-day mRS scores (Figure, aOR 0.48, 95% CI 0.31-0.74). Higher 24-hour SBP variability was unrelated to expansion (aOR 0.99, 95% CI 0.96-1.04) but associated higher END rate (aOR 1.10, 95% CI 1.06-1.15) and 90-day mRS scores (aOR 1.06, 95% CI 1.03-1.10).

Conclusions: Achievement of intensive SBP target within 60 minutes and stable sustention within 24 hours associates lower ICH expansion, better clinical course, and improved outcomes.

Disclosure of interest: Yes



O145/761

Scientific Communication SC22 - Intracerebral Hemorrhage

CEREBRAL AMYLOID ANGIOPATHY IS ASSOCIATED WITH A HIGHER RISK OF SUBDURAL HEMORRHAGE: COMBINED ANALYSIS OF THE UK BIOBANK AND ALL OF US

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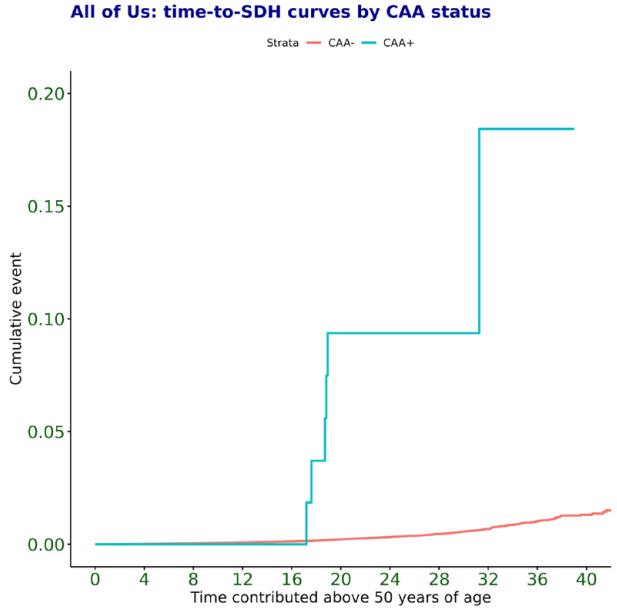
Background and aims: CAA is a common cause of spontaneous intracerebral hemorrhage (ICH). Although other types of intracranial hemorrhages can occur in conjunction with CAA-related ICH, it is unknown whether CAA is a risk factor for other types of intracranial hemorrhage in the absence of ICH. We hypothesize that CAA is an independent risk factor for isolated non-traumatic subdural hemorrhage (SDH).

Methods: We conducted a 2-stage (discovery and replication) observational study that retrospectively analyzed data from the UKBiobank (discovery) and the All of Us (AoU) (replication) study. We included participants over 50 years of age to meet the age threshold for the modified Boston Criteria 2.0. The exposure was a diagnosis of CAA, and the outcome was non-traumatic SDH, both identified using ICD-9 and ICD-10 codes. We used survival analyses with log-rank tests and multivariable Cox proportional hazards models adjusted for demographic characteristics and vascular risk factors.

Results: The discovery phase included 283,452 UK Biobank participants comprising 123 CAA cases and 504 SDH cases. SDH subsequently occurred in 2.4% of participants with CAA versus 0.2% of those without CAA. In a multivariable Cox model, CAA was associated with a significantly increased risk of SDH (Hazard Ratio=7.3;95%CI=2.3-22.7). This finding was replicated among 168,370 AoU participants, where 66 had CAA, and 443 had an SDH (HR=11.66;95%CI=5.2-26.2).



Conclusions: In two large heterogeneous cohorts conducted in different countries, CAA was independently associated with a higher risk of SDH. Further research is needed to determine causality and identify biological pathways that may mediate this association.

	UK Biobank			All of Us		
	Without CAA	With CAA	P-value	Without CAA	With CAA	P-value
Numbers	373,792	125		207,138	67	
Demographics						
Age, mean (sd)	60.1 (5.4)	64.7 (3.7)	<0.001	64.1 (9.0)	70.8 (8.2)	60.1 (5.4)
Sex female	202,166 (54.1%)	64 (51.2%)	0.577	115,446 (55.7%)	26 (38.8%)	0.109
Ethnicity: White	357,074 (96.2%)	119 (95.2%)	0.182	122,959 (59.4%)	48 (71.6%)	0.393
Ethnicity: Asian	5,869 (1.6%)	2 (1.6%)		4,135 (2.0%)	1 (1.5%)	
Ethnicity: Black	4,146 (1.1%)	4 (3.2%)		40,346 (19.5%)	9 (13.4%)	
Ethnicity: Hispanic	NA	NA		26,155 (12.6%)	3 (4.5%)	
SDH						
SDH, n (%)	630 (0.2%)	3 (2.4%)	<0.001	478 (0.2%)	6 (9.0%)	<0.001

Disclosure of interest: No

O146/1891

Scientific Communication SC22 - Intracerebral Hemorrhage

EFFECT OF BLOOD PRESSURE LOWERING ON A GLOBAL ANALYSIS OF OUTCOMES AFTER INTRACEREBRAL HAEMORRHAGE: ANALYSIS OF INDIVIDUAL PARTICIPANT DATA (IPD) FROM THE BLOOD PRESSURE IN ACUTE STROKE COLLABORATION (BASC)

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Background and aims: Elevated blood pressure (BP) after acute spontaneous intracerebral haemorrhage (ICH) is associated with poor outcome. We assessed the effect of BP-lowering interventions on individual and global clinical outcomes after ICH.

Methods: Post-hoc analysis of the BASC dataset. Included studies shared IPD for patients with acute ICH recruited to randomised controlled trials

(RCTs) assessing effects of various strategies to lower BP within 7 days of ICH onset. Outcomes included modified Rankin Scale (mRS), EuroQol–5 dimension health status utility value (EQ-5D HSUV), mortality and serious adverse events (SAEs). Baseline characteristics are presented as mean (SD), number (%) and median [IQR]. Global analysis of mRS/EQ-5D/death/SAEs used the Wei-Lachin test of multiple outcomes to determine individual and summary effects with results presented as Mann-Whitney Differences (MWD) with 95% CI.

Results: BASC-ICH included 6221 patients (mean age 64.2 (±12.9) years, female 36.4%) from 16 RCTs at a median time from symptom onset to randomisation of 3.8 [IQR 2.6, 5.3] hours. There was no evidence of an effect of BP-lowering after ICH on global outcomes: MWD 0.00, 95% CI (-0.02, 0.02), p=0.75. Similar results were seen for the individual outcomes: mRS MWD -0.01, 95% CI (-0.04, 0.02), EQ-5D -0.02 (-0.06, 0.01), death 0.00 (-0.02, 0.02), and SAEs 0.02 (-0.01, 0.04).

Conclusions: Lowering BP after ICH appeared to have no effect on overall clinical outcomes using a global analysis involving data about functional outcome, health-related quality of life, mortality and SAEs.

Disclosure of interest: No

O147/281

Scientific Communication SC22 - Intracerebral Hemorrhage

INFLUENCE OF TIME IN ACHIEVING TARGET SYSTOLIC BLOOD PRESSURE ON OUTCOME AFTER INTRACEREBRAL HAEMORRHAGE: THE BLOOD PRESSURE IN ACUTE STROKE COLLABORATION

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Background and aims: To investigate whether earlier times in achieving and maintaining systolic blood pressure (SBP) 120-140 mmHg is associated with favorable outcomes in patients with acute intracerebral hemorrhage (ICH).

Methods: We pooled individual patient data from randomized controlled trials in BASC. Participants were stratified by time (hour) to first achieved (**1, 1-6, 6-12, 12-18, 18-24 others, and not achieved)** and subsequently maintained SBP 120-140 mmHg over 24 hours. Primary outcome was ordinal mRS scores at 90-180 days. A one-stage approach was used, with adjustment using generalized linear mixed models with covariables and trial as a random effect.

Results: 5761 (54.1%) patients (mean age 64.0 [SD 13.0], 2120 [36.8%] females) were included in this analysis. Compared with participants who did not **a**chieve, earlier achievement and maintenance of SBP 120-140 mmHg over 24 hours was associated with better functional outcomes **(**1h [odds ratio **0.68, 95% confidence interval 0.47-0.98**], 1-6h [**0.67, 0.53-0.83**], 6-12h [**0.60, 0.46-0.79**], 12-18h [**0.62, 0.49-0.78**], 18-24h [**0.73, 0.62-0.86**], and others [0.77, 0.68-0.88]; P for linear trend 0.010**).** It was significantly associated with both better functional outcomes (P =0.0002 for interaction) and less hematoma expansion (HE) at 24 hours (P =0.005 for interaction) only among those who were randomized within 2 hours post-ictus. There were no differences in the frequency of serious cardiac and renal adverse events across groups.

Conclusions: Earlier achieving, especially within 2 hours, and maintaining SBP 120-140 mmHg over 24 hours after acute ICH is safe and associated with less HE and better functional outcomes

Disclosure of interest: No

O148/193

Scientific Communication SC22 - Intracerebral Hemorrhage

INTRACEREBRAL HAEMORRHAGE IN PATIENTS TAKING DIFFERENT TYPES OF ORAL ANTICOAGULANTS – A POOLED INDIVIDUAL PATIENT DATA ANALYSIS FROM TWO NATIONAL STROKE REGISTRIES

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Background and aims: We investigated outcomes in patients with intracerebral haemorrhage (ICH) according to prior treatment with Vitamin-K-antagonists (VKAs) or direct oral anticoagulants (DOACs).

Methods: Individual patient data study combining data of two prospective national stroke registries from Switzerland and Norway (2013-2019). We assessed the association of prior anticoagulation as compared to patients without anticoagulation with favourable functional outcome (modified-Rankin-Scale 0-2) and mortality at 3 months using multivariable logistic regression.
Results: Among 11,350 patients with ICH (mean [SD] age 73.6 [13.4] years; 47.6% women), 1,491 (13.1%) were taking VKAs and 1,204 (10.6%) DOACs (94.0% factor-Xa-inhibitors). The spectrum of prior anticoagulation changed during the study period (figure 1, $p<0.001$). Baseline NIHSS did not differ (median NIHSS, 7 [IQR, 2-15] for no anticoagulation, 8 [3-17] for VKA and 7 [3-15] for DOAC).
Prior VKA therapy (n=259, 20.7%; aOR 0.70, 95%CI 0.49-0.99) but not prior DOAC therapy (n=246, 25.4%; aOR 1.06, 95%CI 0.73-1.53) was independently associated with lower odds for favourable outcome compared to patients without anticoagulation (n=2,556, 37.6%).
Prior VKA therapy (n=720, 49.4%; aOR 1.71, 95%CI 1.25-2.33) but not prior DOAC therapy (n=460, 39.7%; aOR 1.35, 95%CI 0.99-1.86) was independently associated with increased odds for mortality compared to patients without anticoagulation (n=2,512, 30.2%).
Conclusions: The spectrum of anticoagulation-associated ICH changed during the last years. Compared to no prior anticoagulation, prior VKA treatment but not prior DOAC treatment was associated with poorer outcomes. Specific reversal therapy for factor-Xa-inhibitors was not available during study period and thus outcomes may further improve in the future.

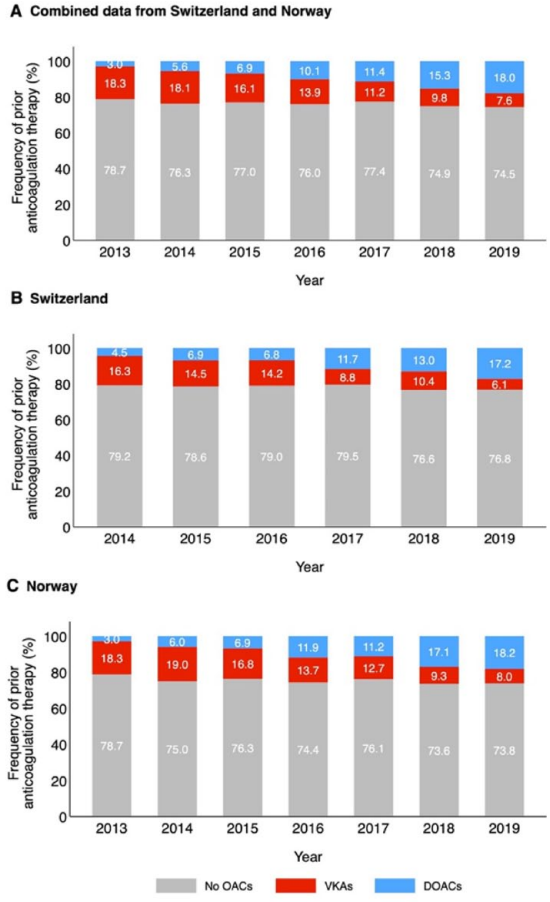

Figure 1. Frequency of prior anticoagulation therapy in intracerebral haemorrhage from 2013 to 2019 (**A**= combined data from Switzerland and Norway, n=11,350 patients; **B**= Switzerland, 3,501 patients and **C**= Norway, 7,849 patients).

Disclosure of interest: Yes

O149/899

Scientific Communication SC22 - Intracerebral Hemorrhage

DEVELOPMENT OF A PREDICTIVE SCORE FOR MORTALITY AT THE ACUTE PHASE OF INTRACEREBRAL HEMORRHAGE FROM THE POPULATION-BASED BREST STROKE REGISTRY

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Background and aims: Intracerebral hemorrhages (ICH) have a poor prognosis. Identification of risk factors for mortality would allow better selection of patients for therapeutic research. The objective of this study is to develop a new prognostic score for 30-day mortality of ICH.
Methods: Spontaneous ICH between 2008 and 2018 from the population-based Brest Stroke Registry were included. Demographic, risk factors, clinical (Glasgow Coma Score (GCS), NIHSS, Rankin), and radiological data were collected. Missing data were imputed by the Predictive Mean Matching method. The score was created from a training cohort (2/3) and tested on a validation cohort (1/3). Univariate and multivariate logistic analyses were performed to establish this score. We compared the performance of the score versus the recognized Hemphill score with ROC curves.
Results: From 9875 strokes, 1223 had a primary ICH. Multivariate model was established through selection of variables significantly associated with mortality in the univariate analysis. multivariate analysis identifed the following variables for our score : age $\geqslant$ 80 y.o, GCS, NIHSS score, Rankin score before admission, ICH volume $>$ 30 cm^3, presence of intraventricular hemorrhage. The AUC of our score on the learning cohort was 0.88 vs 0.82 for the Hemphill score and 0.86 vs 0.80 on the validation cohort.
Conclusions: We developed a new prognostic score for 30-day mortality for ICH using variables from admission as soon as the first brain scan is performed. The integration of the Rankin score prior admission and NIHSS increased the statistical performance of our score compared to Hemphill score.
Disclosure of interest: No

O150/680

Scientific Communication SC22 - Intracerebral Hemorrhage

HAEMATOMA EXPANSION AND FUNCTIONAL OUTCOME IN DEEP VERSUS LOBAR INTRACEREBRAL HAEMORRHAGE: ANALYSIS OF POOLED INDIVIDUAL PARTICIPANT DATA FROM BASC

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Background and aims: The location of intracerebral haemorrhage (ICH) is a key determinant of outcome. We determined associations of haematoma location on early neurological deterioration (END), early hematoma expansion (HE) and functional outcome in ICH.
Methods: Post-hoc analysis of the Blood pressure in Acute Stroke Collaboration (BASC) ICH dataset. Generalized mixed models were used to explore associations of haematoma location (deep vs. lobar) and END (at 7 days), HE (at 24 hours; absolute ⩾6 mL or relative ⩾33%) and death or dependency (modified Rankin scale scores 3-6) at 90 days.
Results: Among 3642 ICH (mean age 63.3±13.0, female 37.7%) patients, 86.1% had deep haematoma. Those with lobar haematoma had higher END (19.6% vs 10.1%), HE (29.6% vs 25.0%) and death or dependency (60.6% vs 55.3%) compared to those with deep haematoma. After adjustment for confounders including baseline haematoma volume, patients with deep haematoma had increased odds of death or dependency (aOR 2.44, 95%CI 1.85-3.22). The results were consistent after further adjustment for features of brain frailty. Baseline haematoma volume contributes a reversed result according to location: deep was associated with worse outcomes when small (⩽5.9 ml) and large (>20.0 ml) volume compared to lobar.
Conclusions: In patients with acute ICH, lobar ICH location is associated with greater frequency of early ND and HE. However, after adjustment for baseline ICH volume, deep ICH location was significantly associated with poorer functional outcomes at 90 days, especially in those with smaller or larger baseline ICH volume.
Disclosure of interest: No

O151/1909

Scientific Communication SC23 - Secondary Prevention

SAFETY OF CAROTID ENDARTERECTOMY FOR SYMPTOMATIC STENOSIS BY AGE: META-ANALYSIS WITH INDIVIDUAL PATIENT DATA

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Background and aims: There is uncertainty whether elderly with symptomatic carotid stenosis(SCS) have more adverse events post-carotid endarterectomy(CEA). In trials, recurrent stroke risk on medical therapy alone increased with age, whereas operative stroke risk was unrelated. Few octogenarians were included in trials and there was no systematic analysis of all study types. We aimed to evaluate the safety of CEA in symptomatic elderly.
Methods: We performed systematic review and meta-analysis of studies reporting post-CEA stroke, MI and death in SCS patients(Image1). We included observational studies and interventional arms of randomized trials if outcome rates were provided. Individual patient data(IPD) from 4 prospective cohorts enabled multivariate-analysis.
Results: Of 47 studies(107587 patients), risk of perioperative stroke was 2.04%(1.94–2.14) in octogenarians(390 strokes/19101 patients) and 1.85%(1.75–1.95) in nonoctogenarians (1395/75537);P=0.046. Perioperative death was 1.09%(0.94–1.25) in octogenarians (203/18702) and 0.53%(0.48–0.59) in nonoctogenarians(392/73327);P<0.0001(Image2). Per 5-year age increment, a linear increase in perioperative stroke, MI, and death were observed;P=0.04-0.002(Table1). However, in past 3 decades, perioperative stroke±death declined significantly in octogenarians(7.78%[5.58–10.55] before year 2000 to 2.80%[2.56–3.04] after 2010);P<0.0001(Table2). In IPD multivariate-analysis(5111 patients), age ⩾85 years was independently associated with perioperative stroke (P<0.0001) and death (P=0.005)(Table3). Yet, survival was similar for octogenarians versus nonoctogenarians at 1-year (95.0%[93.2–96.5] versus 97.5%[96.4–98.6];P=0.08), as was 5-year stroke risk (11.93%[9.98–14.16]) versus 12.78%[11.65–13.61];P=0.24)(Image3)
Conclusions: We found a modest increase in post-CEA risks with age for SCS. As stroke risk increases with age when on medical therapy alone, our findings support selective urgent intervention in symptomatic elderly.

Image 1. PRISMA Diagram for Systematic Review and Meta-analysis

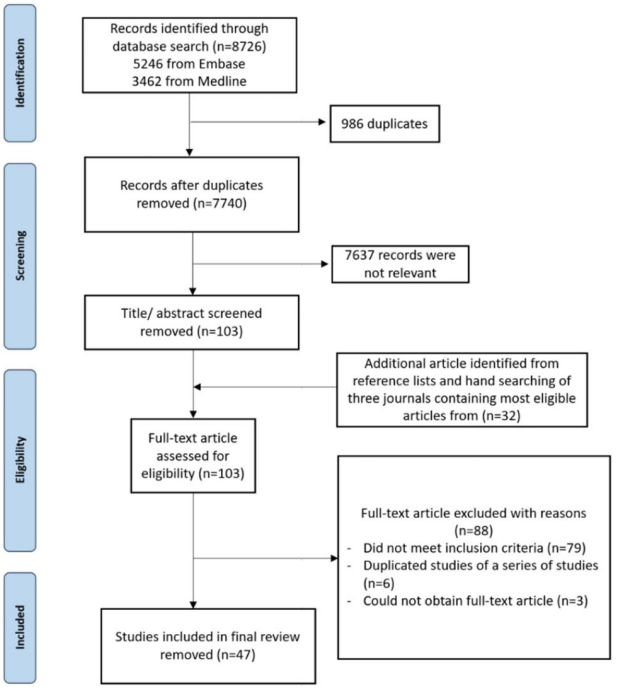
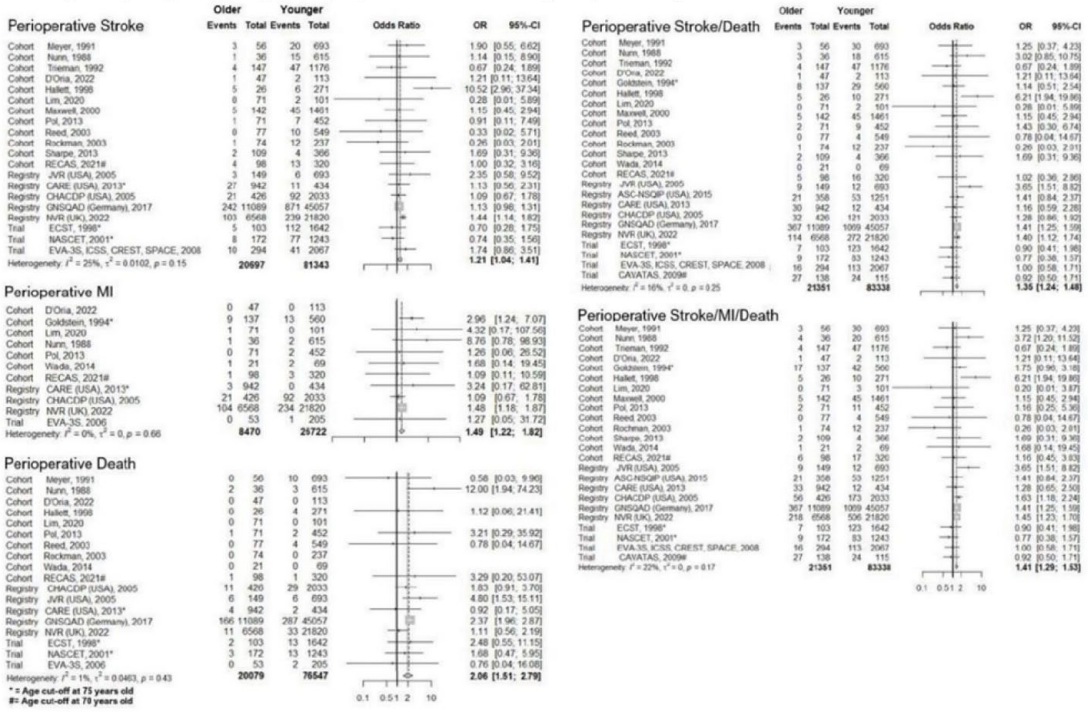


Image 2. Meta-analysis of perioperative any stroke, MI, and death via in-study cut-point analysis.

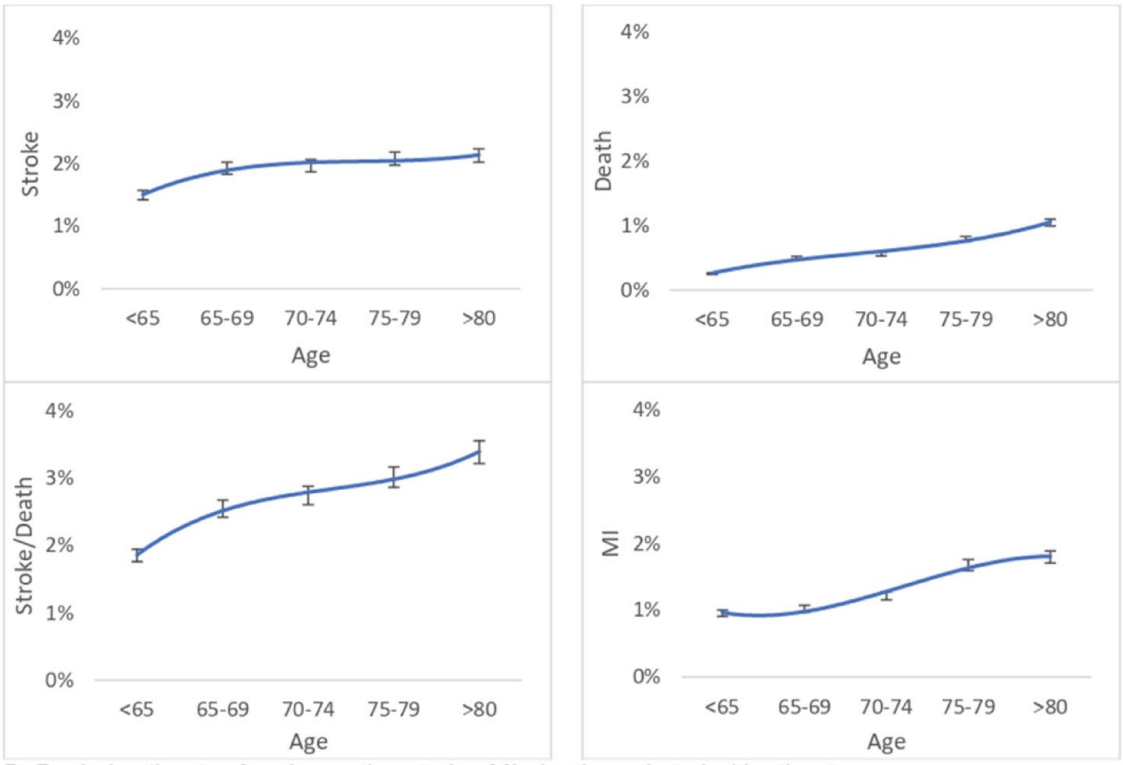


All comparisons were made comparing age ≥80 versus <80 years unless otherwise indicated. Odds ratios (boxes/diamonds) greater than 1 indicate higher risk in older versus younger patients. *= Age cut-off at 75 years old. #= Age cut-off at 70 years old.

Table 1. Meta-analysis and pooled estimate of perioperative stroke, MI, death, and stroke/death in age-stratified studies

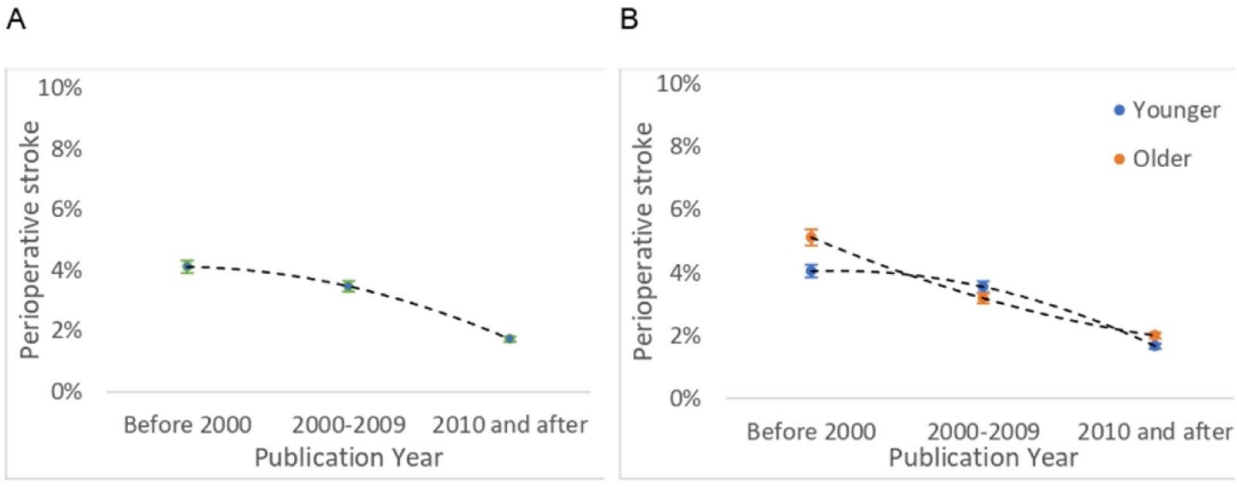
	Older		Younger		Odds ratio (95% CI)	
Stroke	Events	Total	Events	Total		
65			309	20621	1.00 [0.85, 1.17]	
65-69	246	12763			1.29 [1.09, 1.53]	
70-74	387	19670			1.32 [1.13, 1.53]	
75-79	373	17924			1.40 [1.20, 1.63]	
80	346	16243			1.43 [1.23, 1.67]	p=0.03953
MI						
65			69	7217	1.00 [0.72, 1.40]	
65-69	47	4597			1.07 [0.74, 1.55]	
70-74	74	6083			1.28 [0.92, 1.77]	
75-79	105	6263			1.77 [1.30, 2.40]	
80	128	7118			1.90 [1.41, 2.55]	p=0.007639
Death						
65			54	20942	1.00 [0.69, 1.46]	
65-69	62	12378			1.95 [1.35, 2.81]	
70-74	103	18383			2.18 [1.57, 3.03]	
75-79	139	17514			3.09 [2.26, 4.24]	
80	191	18204			4.10 [3.03, 5.55]	p=0.002193
Stroke/Death						
65			402	21690	1.00 [0.87, 1.15]	
65-69	326	12800			1.38 [1.19, 1.60]	
70-74	516	18819			1.49 [1.31, 1.70]	
75-79	542	17975			1.65 [1.44, 1.88]	
80	553	16330			1.86 [1.63, 2.11]	p=0.00452

A. Meta-analysis of age-stratified studies in perioperative stroke, MI, death, and stroke/death.



B. Pooled estimate of perioperative stroke, MI, death, and stroke/death rate.
Age <65 years was used as reference group compared with older age groups.

Table 2. Time trend in pooled estimates of perioperative stroke and death rates in symptomatic carotid stenosis patients treated by carotid endarterectomy, stratified by age cut-off at 80 years old.



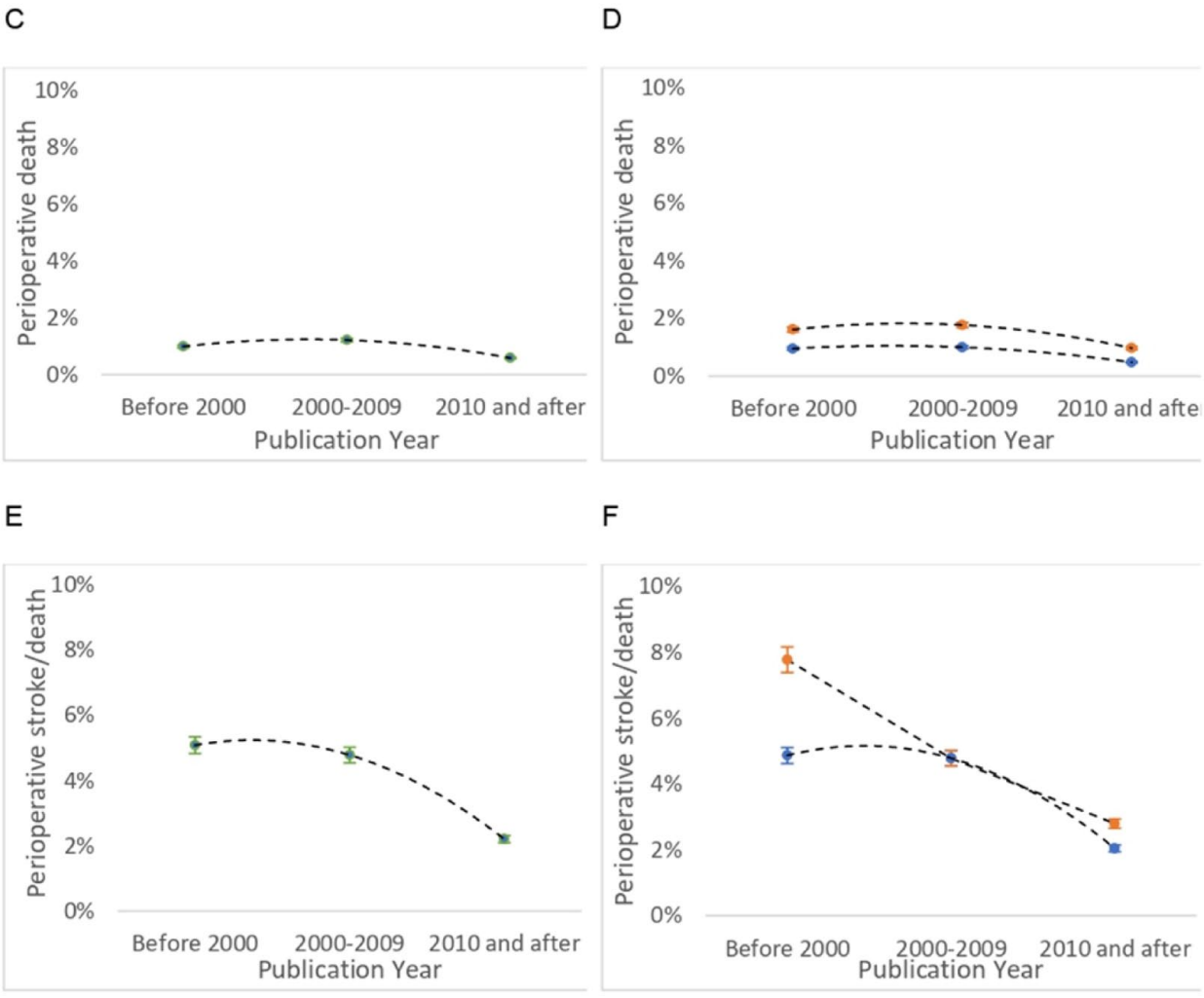
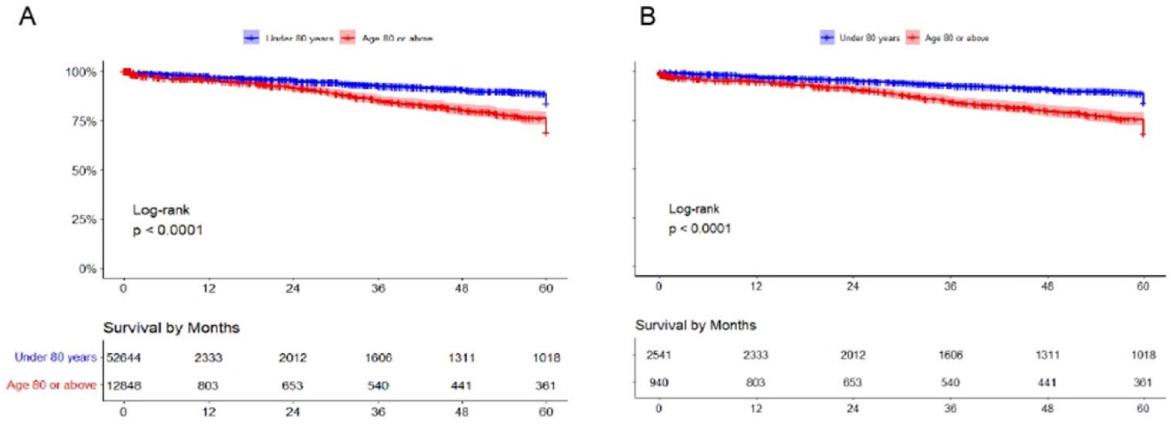


Image 3. Kaplan Meier curve of survival including (A) and excluding (B) papers reporting perioperative events only, cumulative incidence of stroke including (C) and excluding (D) papers reporting perioperative events only, cumulative incidence of MI including (E) and excluding (F) papers reporting perioperative events only



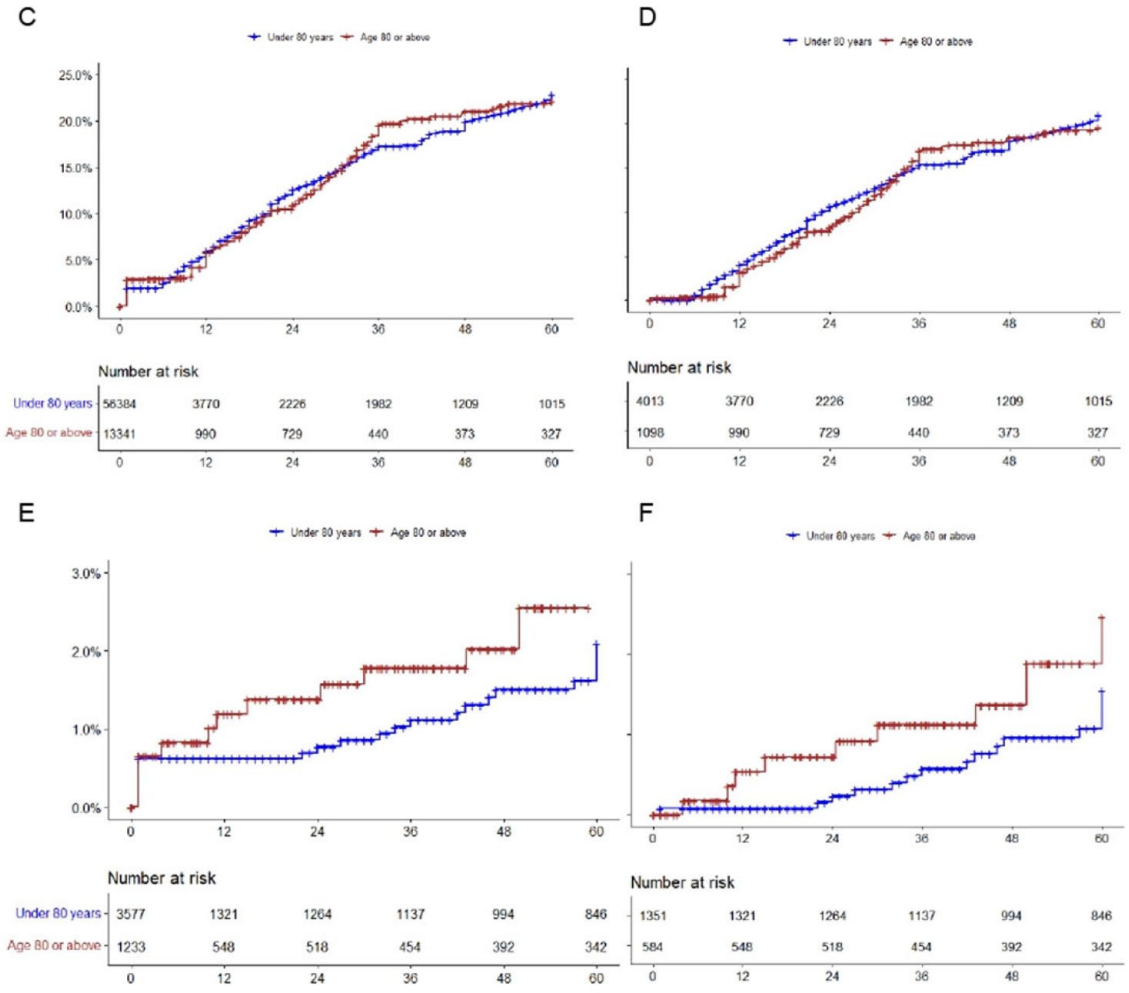


Table 3. Univariate and multivariate analysis of risk factors for perioperative adverse events

	Stroke						MI						Death					
	Univariate			Multivariate			Univariate			Multivariate			Univariate			Multivariate		
	OR	CI	P value	OR	CI	P value	OR	CI	P value	OR	CI	P value	OR	CI	P value	OR	CI	P value
Age <65	1	0.46 1.51	0.28	1	0.68 1.42	0.30	1	0.27 1.64	0.30	1	0.56 1.43	0.14	1	0.28 1.61	0.59	1	0.44 1.56	0.82
65-69	1.18	0.71 1.95	0.52	1.13	0.67 1.90	0.29	1.73	0.81 3.72	0.16	1.29	0.78 1.80	0.19	1.78	0.66 4.79	0.26	1.21	0.57 1.88	0.53
70-74	1.00	0.61 1.64	0.99	1.00	0.61 1.63	0.40	0.97	0.43 2.22	0.95	0.95	0.49 1.41	0.89	1.37	0.51 3.70	0.53	1.22	0.87 1.57	0.76
75-79	1.46	0.92 2.30	0.11	1.43	0.90 2.27	0.10	1.48	0.70 3.16	0.31	1.45	0.81 2.09	0.29	1.43	0.83 2.85	0.48	**1.33**	**1.03 1.63**	**0.0012***
80-84	**1.28**	**1.08 1.48**	**0.0042***	1.27	0.85 2.21	0.49	**2.06**	**1.09 4.31**	**0.045***	1.49	**1.10 2.68**	**0.023***	1.63	0.47 5.59	0.44	1.54	0.40 5.55	0.11
≥85	1.42	0.86 1.63	0.61	**1.35**	**0.91 2.26**	**0.0021***	1.67	0.65 4.27	0.29	1.55	0.47 2.63	0.34	2.35	0.92 6.00	0.07	**1.77**	**1.12 2.42**	**0.005***
Female sex	0.88	0.63 1.18	0.17	0.84	0.61 1.63	0.26	0.83	0.53 1.30	0.20	0.80	0.33 1.27	0.77	0.80	0.45 1.40	0.21	0.80	0.37 1.53	0.97
Hypertension	1.09	0.77 1.53	0.31	1.05	0.78 1.46	0.31	0.90	0.57 1.43	0.32	0.66	0.41 1.07	0.09	0.98	0.54 1.78	0.48	0.78	0.50 1.33	0.33
Diabetes	1.28	0.91 1.81	0.08	1.23	0.82 1.79	0.21	1.23	0.76 1.98	0.20	1.21	0.61 3.01	0.81	1.06	0.57 1.97	0.43	1.02	0.40 2.14	0.21
CAD	0.95	0.65 1.40	0.41	0.94	0.69 1.45	0.10	1.26	0.77 2.07	0.18	1.23	0.70 1.76	0.09	1.06	0.55 2.03	0.44	1.06	0.34 2.38	0.45
Chronic Lung conditions	0.96	0.56 1.63	0.44	0.95	0.57 1.62	0.65	**1.71**	**0.95 3.08**	**0.03545***	1.59	0.33 2.85	0.12	**2.40**	**1.17 4.92**	**0.0067***	**2.11**	**0.96 4.27**	**0.048***
Smoking	0.79	0.43 1.44	0.21	0.90	0.44 1.68	0.76	0.60	0.24 1.15	0.14	0.79	0.27 1.80	0.6098	0.79	0.28 2.21	0.44†	0.79	0.24 2.88	0.71†
Prior Stroke	**3.02**	**2.13 4.29**	**<0.001***	**2.98**	**1.35 4.61**	**<0.001***	**2.59**	**1.58 4.25**	**<0.001***	2.52	0.94 4.10	0.0507	**4.55**	**2.21 9.38**	**<0.001***	**3.22**	**1.81 4.63**	**<0.001***
Prior TIA	**1.53**	**1.36 1.77**	**<0.001***	1.50	0.65 3.12	0.09	**1.64**	**1.23 1.74**	**<0.001***	1.34	0.51 2.17	0.9171	**1.54**	**1.26 2.09**	**0.043***	**1.19**	**1.08 1.30**	**0.011***
Prior Amaurosis Fugax	**1.33**	**1.18 0.62**	**<0.001***	0.91	0.32 2.21	0.25	0.78	0.41 1.48	0.28	0.78	0.44 3.93	0.54	1.05	0.86 1.46	0.08511	**1.05**	**1.01 1.09**	**0.003***

*p<0.05, †Fisher exact test. Age <65 years was used as the reference group for age

Disclosure of interest: No

O152/1106

Scientific Communication SC23 - Secondary Prevention

THE CENTRALLY OBSERVED HOME TELEMETRIC MONITORING OF BLOOD PRESSURE TO MANAGE INITIAL TREATMENT (COMMIT) STUDY

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Background and aims: Guidelines recommend BP<130/80mmHg after TIA/stroke, but real-world control is poor. Centrally-monitored home BP monitoring (HBPM) might allow earlier diagnosis of missed hypertension and better titration of treatment in patients managed at home. We aimed to determine effectiveness and acceptability of telemetric-HBPM-guided BP treatment in acute TIA/stroke and to assess long-term BP control.

Methods: In a population-based study (Oxford Vascular Study), all patients with acute TIA/minor stroke underwent daily telemetric-HBPM for up to 3-months, irrespective of baseline BP. Treatment was titrated to target BP<130/80mmHg, with control assessed by 24-hour ABPM at one and 12-months, acceptability by anonymised questionnaire, medication adherence by interview/prescribing records, and 10-year risk of major vascular events (MVE) by face-to-face follow-up.

Results: Of 1656 patients (mean/SD age=69.7/13.1) who undertook HBPM, 1044 (63.0%) had their initially-prescribed BP-lowering treatment increased during the first month. Mean/SD initial clinic BP decreased by 24.2/11.9mmHg (p<0.0001) by 3-month follow-up, control was sustained on 12-month ABPM (daytime mean/SD SBP=129.5/13.3; DBP=74.3/8.0), and patient satisfaction was >90%. However, of the 1435 (88.7%) patients on BP medication at 12-months, 496 (34.6%) had treatment reduced/stopped by non-study clinicians thereafter. This group had higher subsequent BP (10-year SBP=144.5 vs 134.7mmHg, p=0.011) and increased 10-year risk of MVE (177 events; HR=3.01,95%CI=1.98-4.62,p<0.0001) compared with adherent patients, with 42.8 (25.0-59.4)% of MVE-risk attributable to reducing/stopping BP-treatment.

Conclusions: Telemetric HBPM-guided treatment achieved sustained BP control throughout the first year after TIA/stroke. However, subsequent discontinuation of medication accounted for 40% of recurrent MVE, suggesting that some form of longer-term HBPM is necessary.

Disclosure of interest: No

O153/1571

Scientific Communication SC23 - Secondary Prevention

WHAT DOES REAL-WORLD TEACH US ON SHORT-TERM DAPT AFTER MINOR ISCHEMIC STROKE OR HIGH-RISK TIA? DATA FROM READAPT STUDY

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Background and aims: Following the results of randomized controlled trials (RCTs), guidelines recommend short-term (21-90 days) dual antiplatelet treatment (DAPT) for secondary prevention of minor ischemic stroke (NIHSS score ⩽5) or high risk-TIA (ABCD2 score ⩾4). We aim at evaluating DAPT benefits and risks in real-world.

Methods: The Real-life study on short-term dual antiplatelet treatment in patients with ischemic stroke or TIA (READAPT) is a prospective, ongoing, nationwide, multicentre, observational study, which has included patients with non-cardioembolic minor ischemic stroke or high-risk TIA receiving short-term DAPT in clinical practice since February 2021.

Results: Up to 8th January 2023, 59 centers included 1054 patients who completed the 90-day follow-up. Most patients were male (707, 67.1%) with a median age of 72 years (IQR 62-79). According to symptoms duration, 745 (70.7%) patients had an ischemic stroke with a median NIHSS of 3 (IQR 2-4) and 309 (29.3%) a TIA with a median ABCD2 score of 4 (IQR 4-5); 193 (18.3%) received acute revascularization procedures. During the follow-up, 76 (7.3%) patients had a recurrent ischemic event, of which 46 (60%) were ischemic strokes; 13 (1.2%) discontinued DAPT due to conditions requiring anticoagulation; 2 (0.2%) died due to vascular causes; 2 (0.2%) had intracerebral hemorrhages; and 29 (2.7) had bleedings, which in 10 (0.9%) cases led to DAPT discontinuation.

Conclusions: Patients with minor ischemic stroke or high-risk TIA treated with short-term DAPT may have a higher proportion of ischemic recurrences and similar proportion of hemorrhagic events in real-world than RCTs.

Disclosure of interest: No

O154/1336

Scientific Communication SC23 - Secondary Prevention

PREVALENCE, AWARENESS, TREATMENT, AND CONTROL OF DIABETES AMONG 0.98 MILLION PATIENTS WITH STROKE/TIA IN CHINA: A NATIONWIDE OBSERVATIONAL STUDY

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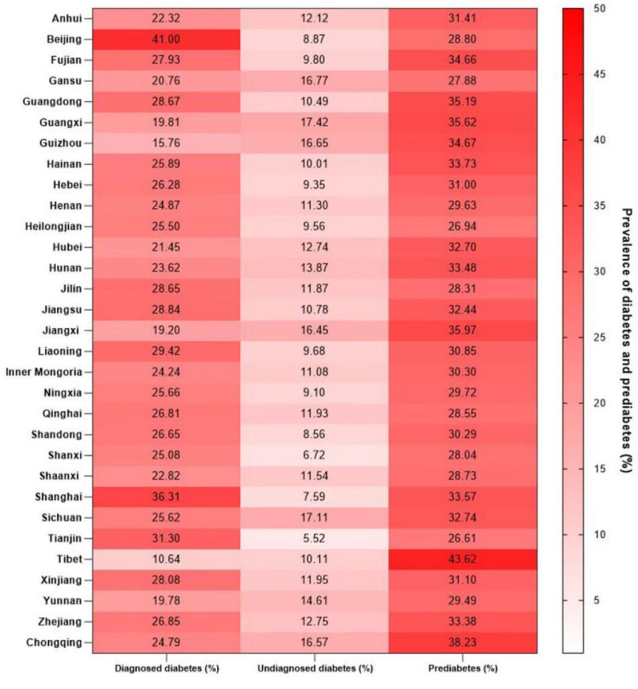
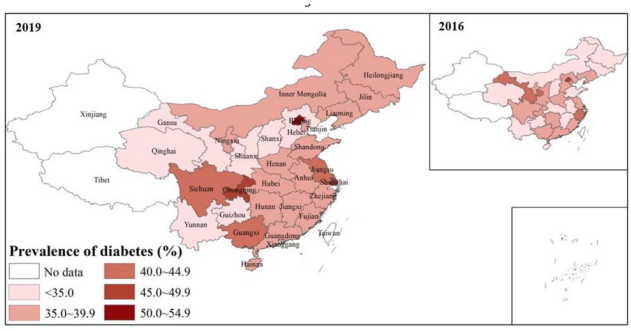
Background and aims: Diabetes and stroke are two of the most common chronic conditions worldwide and the aim of this study is to conduct a comprehensive nationwide epidemiological investigation of their coexistence.

Methods: Subjects from the Chinese Stroke Center Alliance, a multicenter, nationwide registry study, were retrospectively enrolled. The distribution of diagnosed, undiagnosed diabetes, and prediabetes among stroke/TIA patients was investigated, the medical care around diabetes and their respective risk predictors were analyzed, and the association of all above diabetes characteristics with in-hospital death was evaluated using multi-variable Cox regression models.

Results: Of 980625 patients included, 308426 (31.5%) had prediabetes, while 365052 (37.2%) had diabetes, nearly a third undiagnosed (112969, 30.9%), with nationwide distribution presented in Fig 1& 2. Of residual aware diabetic patients, 59.0% were treated, with 27.3% controlled. Compared to Han ethnicity, Zhuang ethnicity had lower prevalence of diabetes (37.3% vs 35.1%) but were less aware (69.4% vs 56.5%), treated (59.4% vs 47.8%), and controlled (27.4% vs 26.0%). Patients with prediabetes, diagnosed and undiagnosed diabetes faced higher risk of in-hospital death (adjusted HR [95%CI]: 1.47[1.35-1.60]; 2.15[1.97-2.34]; 4.20[3.87-4.56], all P<0.001). Unaware and untreated diabetes were independently associated with in-hospital death (adjusted HR [95%CI]: 1.99[1.85-2.14]; 2.84[2.63-3.07, both P<0.001]). Compared with controlled diabetes, those with uncontrolled diabetes had a lower risk of in-hospital death (adjusted HR [95%CI]: 0.77[0.68-0.88], P<0.001).

Conclusions: The findings indicate that diabetes is an important and neglected public health problem among stroke/TIA patients in China, which should be screened and intervened timely.





Disclosure of interest: No

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Scientific Communication SC23 - Secondary Prevention

PERMANENT BILATERAL CAROTID ARTERY IMPLANTS TO PREVENT LARGE VESSEL OCCLUSION STROKE IN ATRIAL FIBRILLATION: CAPTURE 2

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Background and aims: Permanent bilateral common carotid filters capturing emboli with diameter of ⩾1.4 mm may prevent stroke from large vessel occlusion(LVO) in patients with atrial fibrillation(AF).

Methods: *CAPTURE 2* is a multicenter single-arm investigation of carotid filters (Vine; Javelin LLC, Israel) in AF patients ⩾50 years with prior stroke and CHA_2DS_2-VASc score ⩾4 receiving oral anticoagulants(OAC). Ultrasound-guided bilateral trans-cutaneous common carotid artery device injection was performed. After 10 patients were enrolled (phase 1), device design/manufacturing was improved and post-implant antithrombotic regimen intensified in the subsequent 71 patients (phase 2). The primary outcome was major adverse events(MAE) within 30 days of implantation.

Results: Of 81 enrolled patients (mean age 71 years, 43% female, mean CHA_2DS_2-VASc 5), bilateral filter implantation was successful in 78/81(96%) patients. Two patients had a device-related MAE; both were

asymptomatic. During mean follow-up of 13.9 months, ischemic stroke rate was 7.6%/yr (phase 1: 3/10[25.9%/yr] and phase 2: 4/71[4.9%/yr]). In phase 2, the 4 ischemic strokes were non-disabling (NIHSS <3) and none were LVO-associated. During follow up routine ultrasound screening, asymptomatic filter-associated thrombi were detected in 3/10 patients in phase 1; but only in 1/71[1.2%/yr] in phase 2. No patient had carotid stenosis, occlusion, or device migration.

Conclusions: Bilateral carotid filter implantation can be done with a high rate of success and safety in patients with AF and stroke, receiving OAC. This is a promising new treatment for patients with AF and stroke, receiving OAC, with high residual stroke risk. A randomized clinical trial is warranted.

Disclosure of interest: Yes

O156/2014

Scientific Communication SC23 - Secondary Prevention

PREDICTIVE RISK CALCULATOR FOR STROKE RECURRENCE OF ATRIAL FIBRILLATION PATIENTS: PRERISK-AF

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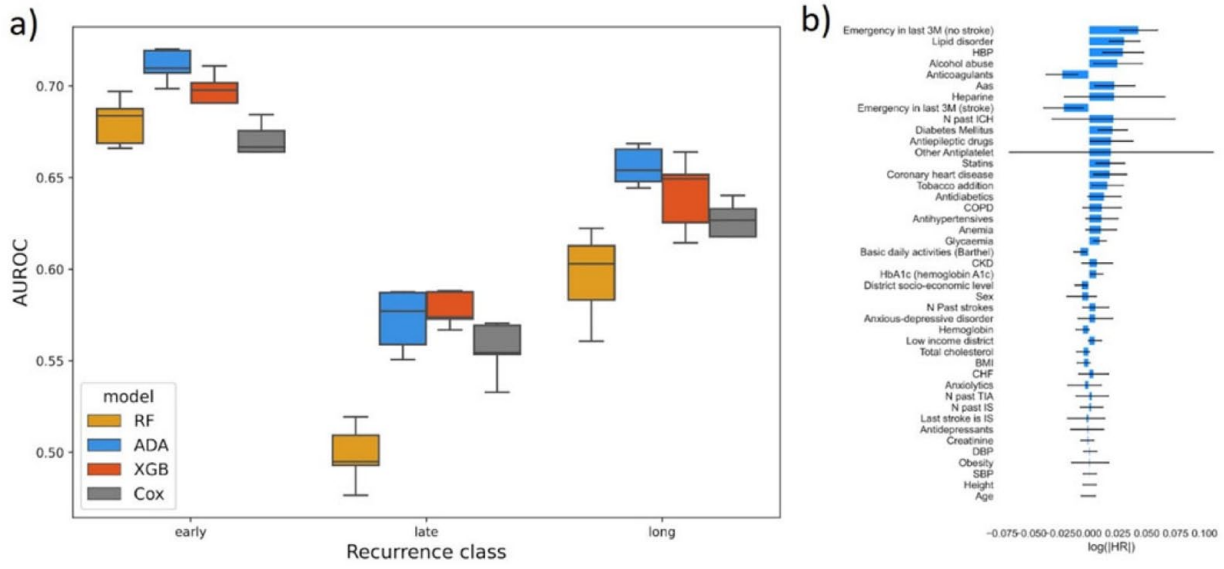
Background and aims: AF is a leading cause of severe stroke. Classical models of risk of embolism in patients with AF point towards vascular risk factors and heart failure as key elements that increase the risk of stroke (CHADSVASC score). Machine learning models may implement new surrogates for a better prediction of stroke recurrence. We aimed to identify new predictors of AF-related stroke recurrence by statistical and ML algorithms in a large population sample.

Methods: A clinical and socioeconomic public healthcare-based dataset of 12412 patients admitted with IS or TIA and AF in 88 public hospitals. We developed several supervised ML models and compared them with statistical time varying survival analysis models (Cox).

Results: Overall, 3386 patients presented a stroke recurrence (19.12%) along a median follow-up of 803 days, with the following temporal distribution: 90 days (early), 1 year (late) and >1 year (long): 17.3%, 6.2% and 5% respectively. Overall ML models performed better than the Cox model and relied on fewer assumptions than statistical Cox model as shown in Fig a, although the latter provided better qualitative and quantitative and more trustable feature explanation (HR: Hazard Ratio), as shown in Fig b. Vascular risk factors showed stronger prediction than age for stroke recurrence in AF patients. Emergency consultation in the previous 3 months emerged as a powerful predictor of stroke recurrence.

Conclusions: PRERISK-AF improves recurrent stroke risk prediction in AF patients by developing survival analysis and ML models. Our results pave the way to personalized AI assisted health-care.

Disclosure of interest: No



O157/1330

Scientific Communication SC23 - Secondary Prevention

ISOSORBIDE MONONITRATE, CILOSTAZOL AND THEIR COMBINATION FOR ONE YEAR: EFFECT ON COGNITIVE OUTCOMES IN PATIENTS WITH SMALL VESSEL STROKE: THE LACUNAR INTERVENTION TRIAL-2 (LACI-2)

Joanna Wardlaw*[1], Fergus Doubal[1], Vera Cvoro[1,2], David Werring[3], Tim England[4], Ahamad Hassan[5], John M Bamford[5], Lisa Woodhouse[4], Iris Isheanesu Mhlanga[4], Christine Roffe[6], John O'brien[7], Philip Bath[4]

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A summary of abstract 1330 and 2145 will be presented in session " Official Welcome and Large Clinical Trials" by Joanna Wardlaw

Background and aims: Cognitive impairment is common following lacunar ischaemic stroke, a form of cerebral small vessel disease (SVD), but there is no specific treatment. The LACunar Intervention Trial-2 (LACI-2, ISRCTN14911850) assessed if isosorbide mononitrate (ISMN) and/or cilostazol could improve post-lacunar stroke cognitive outcomes.
Methods: LACI-2 was an investigator-initiated randomised, open-label, blinded-endpoint, 2x2 factorial trial. Participants age >30yrs with clinical lacunar ischaemic stroke, compatible MR/CT brain imaging, and capacity to consent, were randomised to one year of ISMN 25mg bd, cilostazol 100mg bd, both, or neither. At one year, cognitive function was assessed centrally, masked to drug, using telephone Montreal Cognitive Assessment (tMOCA), telephone Interview of Cognitive Status (TICS), animal naming, and mapped to a 7-level ordinal scale reflecting Diagnostic and Statistical Manual of Mental Disorders (DSM-5) neurocognitive categories. All analyses were co-variate adjusted. Data are median [interquartile range], adjusted odds ratio (aOR), mean difference (aMD), 95% confidence interval.
Results: LACI-2 recruited 363 patients at 26 UK hospitals from 05/02/2018-31/05/2021. Baseline characteristics were well balanced: age 64 [56-72] years, female 112 (31%), stroke-to-randomisation 79 [27-244] days. LACI-2 retained 358 (99.0%) participants at one year, 308 (86%) provided data for 7-level cognition, of whom 184 (60%) had mild or worse cognitive impairment. ISMN (aOR 0.55, 0.36-0.86, p=0.008), and ISMN+cilostazol (aOR 0.44, 0.23-0.85, p=0.015) reduced 7-level cognitive impairment. ISMN+cilostazol improved tMOCA scores (aMD 1.14, 0.24-2.04, p=0.013).
Conclusions: LACI-2 suggests that ISMN, alone or with cilostazol, may improve post-lacunar stroke cognition; a definitive phase-3 trial in lacunar stroke (LACI-3) is planned.
Disclosure of interest: No

ESOC 2023 – Moderated Posters

ACUTE MANAGEMENT DAY 1

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Distal Medium Vessel Occlusions in Acute Ischaemic Stroke: Stent Retriever versus Direct Aspiration - A Systematic Review and Meta-Analysis

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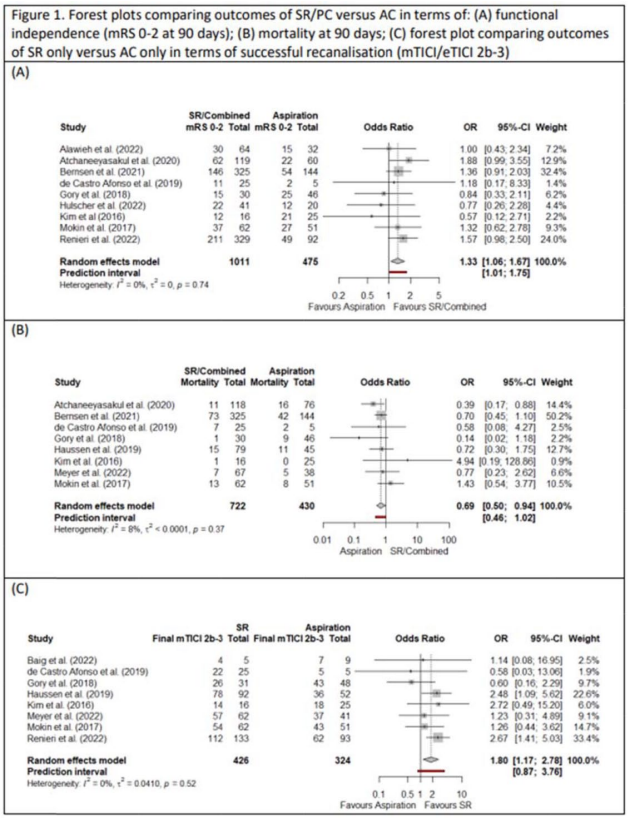
Background and aims: Acute ischaemic stroke due to distal medium vessel occlusion (AIS-DMVO) causes significant morbidity. Endovascular thrombectomy advancement has made treating AIS-DMVO with stent retrievers (SR) and aspiration catheters (AC) possible, however the optimal technique remains unknown. We performed a systematic review and meta-analysis to investigate the efficacy and safety of SR compared to AC in AIS-DMVO.
Methods: We systematically searched PubMed, Cochrane and EMBASE, from inception to 2nd September 2022, for studies comparing SR or primary combined (SR/PC) against AC in AIS-DMVO. We adopted the Distal Thrombectomy Summit Group's definition of DMVO. Efficacy outcomes were functional independence (90-day modified Rankin Scale 0-2), first pass effect (first pass modified/expanded Thrombolysis in Cerebral Infarction scale [mTICI/eTICI] 2c-3), successful final recanalisation (mTICI/eTICI 2b-3), and excellent final recanalisation (mTICI/eTICI 2c-3). Safety outcomes were symptomatic intracranial haemorrhage (sICH) and 90-day mortality.
Results: 13 studies were included, involving 1881 patients with 1274 receiving SR/PC and 607 receiving AC only. SR/PC achieved higher odds of functional independence (odds ratio [OR] 1.33, 95% CI 1.06-1.67) and lower odds of mortality (OR 0.69, 95% CI 0.50-0.94) than AC. Odds of successful/excellent recanalisation and sICH were similar between both groups. Comparing only SR and only AC, SR only achieved higher odds of successful recanalisation (OR 1.80, 95% CI 1.17-2.78).
Conclusions: There is potential for efficacy and safety benefits in SR/PC as compared to AC only in AIS-DMVO, and further trials are necessary to validate these benefits.

Figure 1. Forest plots comparing outcomes of SR/PC versus AC in terms of: (A) functional independence (mRS 0-2 at 90 days); (B) mortality at 90 days; (C) forest plot comparing outcomes of SR only versus AC only in terms of successful recanalisation (mTICI/eTICI 2b-3)



Disclosure of interest: No

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EFFECTS OF INTENSIVE BLOOD PRESSURE LOWERING ON BRAIN OEDEMA IN THROMBOLYSED PATIENTS WITH ACUTE ISCHAEMIC STROKE: ENCHANTED SECONDARY ANALYSIS RESULTS

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Background and aims: Cerebral oedema is recognised as a strong predictor of poor outcomes in acute ischaemic stroke (AIS) and raised blood pressure (BP) may promote its development. We aimed to determine whether intensive BP lowering reduces the severity of cerebral oedema after AIS.

Methods: ENCHANTED was an international, multicentre, 2x2 factorial, open, blinded endpoint, randomised trial which showed no benefit on functional recovery of intensive (target SBP <140mmHg) versus standard (SBP <180mmHg) BP management in thrombolysis-treated patients with AIS. Among ENCHANTED BP-control arm participants (N=2,196), available serial brain images (baseline+follow-up, CT/MRI) were analysed centrally with standardised techniques (Apollo MIStar software) by expert readers blinded to clinical details to rate oedema severity (from 0 'no' to 6 'most severe' oedema [midline shift and effacement of basal cisterns]) and other abnormalities. Primary outcome was any cerebral oedema (score 1-6) with analysis by using logistic regression models.

Results: In 1,477 (67.3%) patients (mean age 67.7 yr; female 39.6%) with sequential scans, the between-group mean SBP difference was 6.6 mmHg over 24 hours. There was no significant effect of intensive BP control on any cerebral oedema (22.12% vs. 22.39%, adjusted OR 1.05, 95% CI 0.81-1.36; p=0.707), and severe oedema (scores 3-6) (2.55% vs. 3.26%, adjusted OR 1.62, 95% CI 0.85-3.0; p=0.145).

Conclusions: Modest early intensive BP lowering does not appear to influence cerebral oedema in thrombolysed AIS patients.

Disclosure of interest: No

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Antiplatelet regimen in emergent carotid stenting for acute ischemic stroke due to tandem occlusion: a meta-analysis of aggregate data

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Background and aims: Emergent carotid artery stenting (eCAS) may be required during mechanical thrombectomy (MT) for acute ischemic stroke (AIS) due to tandem occlusion (TO). The optimal use of antithrombotics (APT) in this context is uncertain especially in case of intravenous thrombolysis. We conducted a systematic review and meta-analysis to evaluate clinical outcome of various intraprocedural APT approaches following eCAS.

Methods: The systematic review followed the PRISMA guidelines. MEDLINE, EMBASE and Scopus were searched from 1/1/04 to 30/09/22 for studies evaluating eCAS in TO. The primary endpoint was 90-days mRS 0-2 (good functional outcome); secondary outcomes were symptomatic intracerebral hemorrhage (sICH), in stent-thrombosis (<24h from eCAS), delayed stent thrombosis (>24h), successful recanalization. Meta-analysis of proportions and meta-analysis of odds ratios (OR) were implemented with random-effect modeling.

Results: Thirty-five studies were included with a total of 1670 patients. Dual antiplatelets (DAPT) or glycoprotein IIb/IIIa inhibitors (GPI) carried marginal higher rates of good functional outcome compared with no (noAPT) or single antiplatelets (SAPT). Sensitivity analysis and meta-regression excluded a significant impact of rates of intravenous thrombolysis and ASPECTS. GPI had marginal increase in sICH over DAPT, SAPT or noAPT. GPI and DAPT showed marginal benefit over SAPT and noAPT in terms of in-stent thrombosis.

Conclusions: Rates of good functional outcome seem similar after eCAS independent from antithrombotics used, with marginal benefit of GPI and DAPT. Antithrombotics may be considered after intravenous thrombolysis to maintain stent patency although there is a minor non-significant increase in sICH risk.

Disclosure of interest: No

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COMPARING STENTING VERSUS MEDICAL THERAPY FOR INTRACRANIAL ARTERIAL STENOSIS: A SYSTEMATIC REVIEW AND INDIVIDUAL PATIENT DATA META-ANALYSIS

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Background and aims: Intracranial stenosis is a major cause of stroke globally. Between stenting and medical therapy, it is debated which is the optimal treatment for symptomatic intracranial stenosis. We compared the outcomes of both procedures for symptomatic intracranial stenosis.

Methods: PubMed, Embase and Cochrane CENTRAL were searched from inception to 17 August 2022 for eligible studies. Outcomes for both procedures were evaluated using one-stage and two-stage meta-analyses. For the one-stage meta-analysis, individual patient data was reconstructed from Kaplan-Meier curves, pooled and analysed using shared frailty and stratified Cox models, and restricted mean survival time (RMST) techniques. For two-stage meta-analysis, stroke, death, transient ischemic attacks and haemorrhage incidences were compared using random-effects models.

Results: Data from 1090 patients were analysed. In the first-year post-treatment, patients who underwent stenting had a significantly higher stroke/death risk (RMST: -0.83 months [-1.30, -0.37]) and hemorrhage risk (Risk Ratio (RR): 11.87 [2.25, 62.54], I^2=0%). These results were corroborated by the shared frailty and stratified Cox models. Patients who underwent stenting also had a higher risk of ischemic stroke (RR=2.22 [1.28, 3.86], I^2=0%) and haemorrhage (RR: 12.66 [2.41–66.45], I^2=0%) within the first 30 days. Differences in 3-year outcomes of stroke and death were insignificant.

Conclusions: Medical therapy has a more favourable risk-benefit profile over stenting in the short term, especially in the first 30 days post-treatment. In the long term, there are insignificant differences in outcomes between both interventions. More should be done to improve patient selection and reduce stenting-related peri-procedural risks.

Figure 1: Forest Plot of Ischemic Stroke Outcomes Within 30 Days

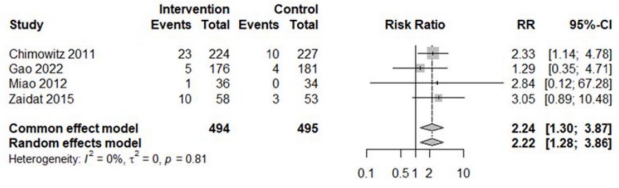


Figure 2: Restricted Mean Survival Time Analysis Across 12 Months

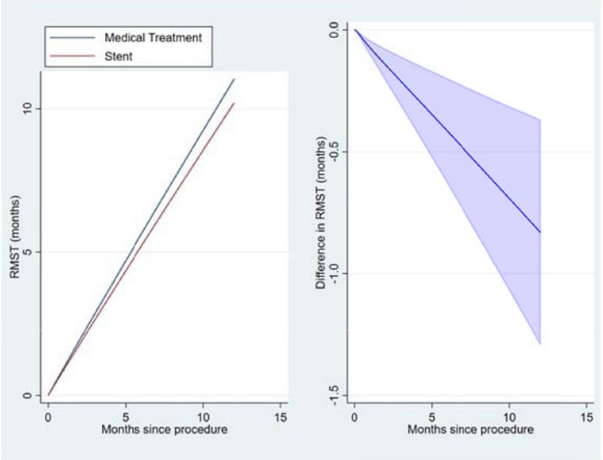
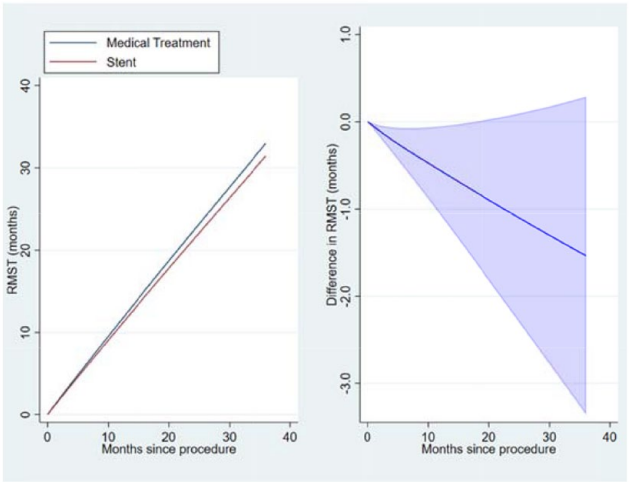


Figure 3: Restricted Mean Survival Time Analysis Across 36 Months



Disclosure of interest: No

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Acute ischemic stroke in active cancer vs non-cancer patients: stroke characteristics, mechanisms and clinical outcomes

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Background and aims: We aimed to estimate the rate of active cancer (AC) in patients with acute ischemic stroke (AIS) and to compare demographics, clinical characteristics, stroke mechanisms, and long-term outcomes between groups.

Methods: Using 2003-2021 data from the Acute-STroke-Registry-and-Analysis-of-Lausanne (ASTRAL), we compared patients with AC, (previously known and newly-diagnosed cancers during AIS hospitalization or within the following 12 months), with non-cancer patients. Patients with inactive cancer were excluded. Outcomes were the modified Rankin Scale (mRS) score at 3 months and death and recurrent cerebrovascular events at 12 months. Logistic regression analyses were performed to compare outcomes between groups.

Results: Among 6686 consecutive patients with AIS, 1065(15.9%) had any history of cancer. After exclusion of 700(10.4%) patients with inactive cancer, there were 365(5.5%) patients with AC and 5621(84.1%)

non-cancer patients. The most represented tumors in the AC group were gastrointestinal(27%), lung(23%), and genitourinary tumors(21%). Among AC patients, 154(42.2%) strokes were considered cancer-related. In multivariable analysis, AC patients were older, less often female, had less traditional vascular risk factors and were less likely to receive reperfusion therapies (Table1). Disability at 3 months (aOR 2.3, 95%CI 1-5.2) (Figure1), risk of death (adjusted HR 1.92, 95%CI 1.5-2.43) and cerebrovascular recurrences (aHR 1.72, 95%CI 1.25-2.37) at 12 months were higher in AC patients (Figure2A-B).

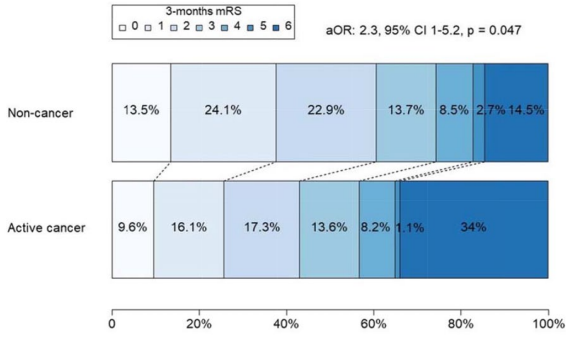
Conclusions: In a large institutional registry spanning nearly two decades, 5.5% of patients with AIS had AC. These had less prior cerebrovascular disease, but a higher 3-month disability and 1-year risk of subsequent death and cerebrovascular recurrences than non-cancer patients.

Table 1: Multivariable analysis of demographic, clinical, radiological, and laboratory variables (only statistically significant differences are shown)

Dependent variable	Independent variable	Odds ratio (95 % CI)	p-value
Active cancer vs non-cancer	Age ≥ 16 years (per 1 year)	1.02, (1.00-1.04)	0.033
	Sex (female)	0.41, (0.27-0.63)	<0.001
	IVT (± EVT)	0.44, (0.28-0.68)	<0.001
	Multiterritorial stroke	2.33, (1.11-4.57)	0.018
	Atrial fibrillation	0.54, (0.33-0.86)	0.011
	Prosthetic valves	0.28, (0.08-0.78)	0.027
	Systolic blood pressure (per 1 mmHg)	0.99, (0.98-1.00)	0.010
	NLR (per 1 unit increase)	1.03, (1.00-1.05)	0.021
	Hemoglobin level (per 1 g/L)	0.97, (0.96-0.98)	<0.001

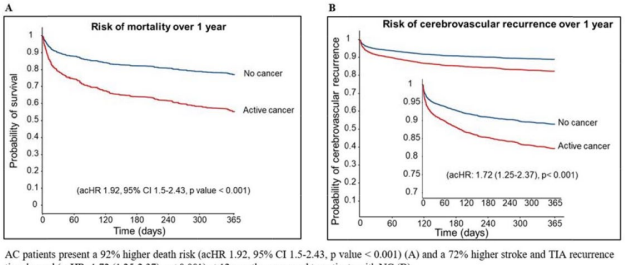
IVT: Intravenous Thrombolysis; EVT: endovascular treatment; NLR: Neutrophil-to-lymphocyte ratio

Figure 1. Modified Rankin Scale (mRS) score shift at three months in active cancer (AC) vs non-cancer (NC) patients with acute ischemic stroke (AIS).



Comparison by ordinal logistic regression showed the effect of having AC in AIS patients compared with NC and is expressed as an adjusted common odds ratio aOR: (aOR: 2.3, 95% CI 1-5.2, p = 0.047)

Figure 2. Mortality and cerebrovascular recurrences at 12 months in active cancer (AC) vs non-cancer (NC) patients.



AC patients present a 92% higher death risk (acHR 1.92, 95% CI 1.5-2.43, p value < 0.001) (A) and a 72% higher stroke and TIA recurrence time hazard (acHR: 1.72 (1.25-2.37), p< 0.001) at 12 months compared to patients with NC (B).

Disclosure of interest: No

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IMPACT OF BRIDGING THERAPY VS ENDOVASCULAR THROMBECTOMY ALONE ON OUTCOMES IN ANTICOAGULATED PATIENTS WITH ATRIAL FIBRILLATION PRESENTING WITH MILD-MODERATE ISCHAEMIC STROKE

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Background and aims: The aim was to assess the impact of bridging intravenous thrombolysis (IVT) before endovascular thrombectomy (EVT), compared to EVT alone, in anticoagulated patients with atrial fibrillation (AF) presenting with mild-moderate acute ischaemic stroke.

Methods: A retrospective analysis (01/09/2018-01/09/2022) using a global health research network was conducted. Logistic regression models were used to compare intracerebral haemorrhage (ICH) and all-cause mortality at 30- and 90-days by whether the participants received bridging therapy (IVT+EVT) versus EVT only. Propensity-score matching was used to balance the two groups for characteristics including age, sex and co-morbidities.

Results: In total, 1,238 patients with acute ischaemic stroke were treated with bridging therapy or EVT only. After propensity-score matching, 384 patients (mean (SD) age 72.7 (12.7); 49.2% female) received bridging therapy, and 384 patients (mean (SD) age 72.9 (12.7); 47.9% female) received EVT only. ICH occurred within 30- and 90-days in 52 (13.5%) and 56 (14.5%) in the bridging therapy group compared with 31 (8.0%) and 33 (8.6%) in EVT only group (odds ratios (ORs) 1.78, 95% confidence interval (CI): 1.11-2.85, and 1.81, 95%CI: 1.15-2.86). Death occurred within 30- and 90-days in 62 (16.1%) and 76 (19.7%) patients in the bridging therapy group compared to 59 (15.3%) and 76 (19.7%) in the EVT only group (ORs 1.06, 95%CI: 0.71-1.56, and 1.00, 95%CI: 0.70-1.42).

Conclusions: In anticoagulated AF patients who presented with mild-moderate acute ischaemic stroke, bridging therapy compared to EVT alone was associated with higher odds of ICH. Further studies are needed to confirm this association.

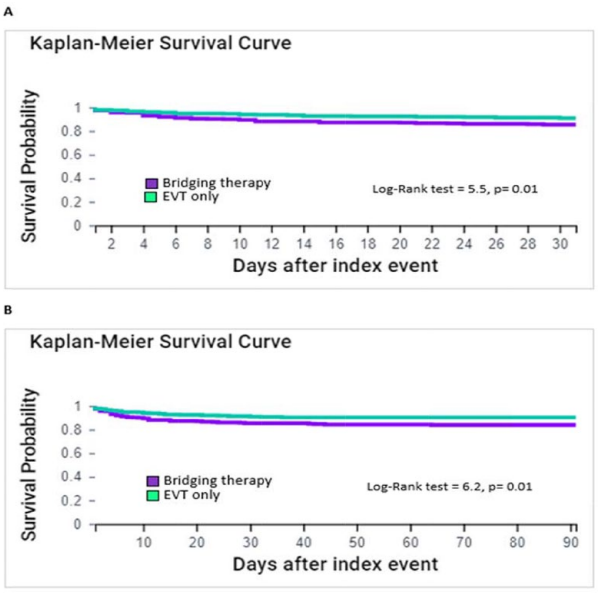

Figure 1: (A) Kaplan-Meier curve depicting the risk of intracerebral haemorrhage events within 30-days after Bridging therapy vs endovascular thrombectomy (EVT) alone in patients with atrial fibrillation (AF) and mild-moderate ischaemic stroke. **(B)** Kaplan-Meier curve depicting the risk of intracerebral haemorrhage events within 90-days after Bridging therapy vs EVT alone in patients with AF and mild-moderate ischaemic stroke.

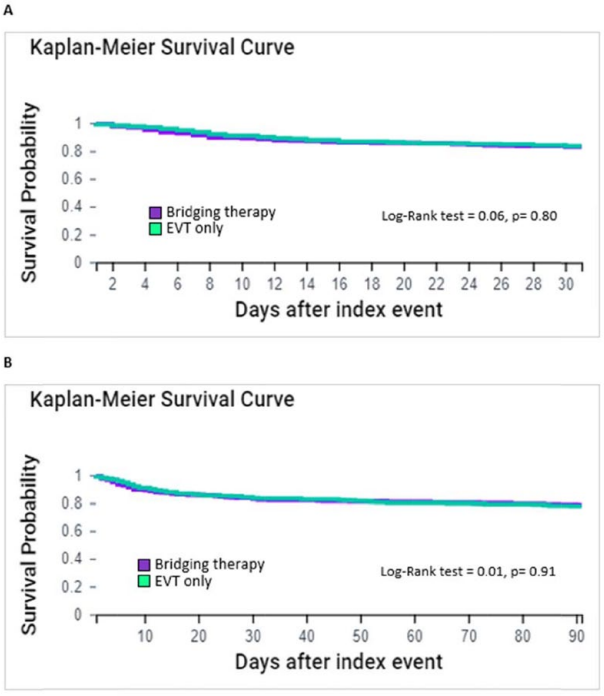

Figure 2: (A) Kaplan-Meier curve depicting the risk of all-cause mortality within 30-days after Bridging therapy vs endovascular thrombectomy (EVT) alone in patients with atrial fibrillation (AF) and mild-moderate ischaemic stroke. **(B)** Kaplan-Meier curve depicting the risk of all-cause mortality within 90-days after Bridging therapy vs EVT alone in patients with AF and mild-moderate ischaemic stroke.

Disclosure of interest: No

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EFFECTS OF INTENSIVE BLOOD PRESSURE LOWERING ON RENAL FUNCTION IN THROMBOLYSED PATIENTS WITH ACUTE ISCHAEMIC STROKE: ENCHANTED SECONDARY ANALYSIS RESULTS

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Background and aims: A safety concern of intensive blood pressure (BP) lowering is harm to renal function. We aim to determine change of renal function after intensive BP lowering in the Enhanced Control of Hypertension and Thrombolysis Stroke Study (ENCHANTED).
Methods: Secondary analysis of ENCHANTED in which thrombolysis-eligible patients with acute ischaemic stroke(AIS) were randomly assigned to intensive(target SBP 130-140mmHg within 1 h) or guideline(target SBP <180mmHg) treatment within 6 h of symptom onset. We use the Chronic Kidney Disease–epidemiology Collaboration(CKD-EPI) equation to calculate the estimated glomerular filtration rate(eGFR). The impact of intensive BP lowering on renal function change(ΔeGFR: follow-up eGFR at 24 h – baseline eGFR) grouped by categories of baseline eGFR (stages G1 [eGFR >90], G2 [eGFR 60-90], and G3 [eGFR <60] mL/min/1.73 m^2) and association with early SBP measures and ΔeGFR were assessed in linear regression models. Sensitivity analysis included multiple imputation for missing follow-up eGFR.
Results: There were 2151 of 2196 patients(mean age 66.9 years, female 38.0%) with available baseline eGFR, with a mean between-group difference of SBP over 24 hours of 5.2mmHg. Magnitude of SBP reduction within 24 h after randomization was 44.6(SD 16.2) mmHg in intensive group. There were no significant differences in ΔeGFR(adjusted mean difference -1.03, 95% CI -3.08-1.01, p=0.323) between groups. The result was consistent across eGFR stages and sensitivity analysis. SBP variability was associated with reduced ΔeGFR after adjustment(p for trend=0.016).
Conclusions: Intensive BP lowering(SBP target 130-140mmHg) appears safe for renal function in thrombolysed AIS patients.
Disclosure of interest: No

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LATE WINDOW THROMBECTOMY OUTCOME OF PATIENTS WITH INTRACRANIAL ATHEROSCLEROSIS

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Background and aims: Outcome information for patients with acute large vessel occlusion (LVO) ischemic stroke caused by intracranial atherosclerosis (ICAS) is inconsistent. We aimed to evaluate modified Rankin scores (mRS) for these patients after mechanical thrombectomy (MT) treated beyond 6 hours after stroke onset.
Methods: Data from prospectively recruited patients was collected. Patients were selected based on DAWN/ DEFUSE 3 criteria. The primary outcome was the mRS ordinal logistic regression at 3 months. Secondary outcomes were rates of functional independence, successful recanalization and safety analysis. Diagnosis of ICAS was based on: ⩾70% stenosis at the end of the procedure or intracranial angioplasty/ stent placement.
Results: 162 patients were recruited. 88 presented with ICAS (54.3%) and 74 were non-ICAS (28 cardiac embolisms, 46 cryptogenic). ICAS patients had longer onset-to-groin times (18.0 [13.1-21.8] vs. 14.0 [13.5-18.0] hours, p=0.007), smaller core (ADC <620: 6.0 [1.5-15.0] vs.14.0 [4.0-25.0], p=0.028) and lower hypoperfusion intensity ratio (0.22 [0.08-0.42] vs. 0.34 [0.19-0.49], p=0.005). There was no difference in the mRS shift analysis (3 [2-4] vs. 3 [1-4], p=0.74). Secondary outcomes showed significantly lower recanalization rates in the ICAS group (83% vs. 93%, p=0.041), while no differences were observed for the proportion of patients with functional independence (48.9% vs. 43.2%, p=0.46), parenchymal hematoma type 2 (4.55% vs. 1.35%, p=0.38) or mortality (10.2% vs. 13.5%, p=0.52).
Conclusions: Compared to non-ICAS, ICAS patients had smaller core, better collateral, and similar functional outcome, despite the longer symptom onset-to-groin, suggesting that the therapeutic time window may be extended in these patients.
Disclosure of interest: No

1083

Comparison of Endovascular versus Standard Medical Therapy on Functional Outcomes and Mortality among Patients with Acute Basilar Artery Occlusion: A Meta-Analysis of Randomised Controlled Trials

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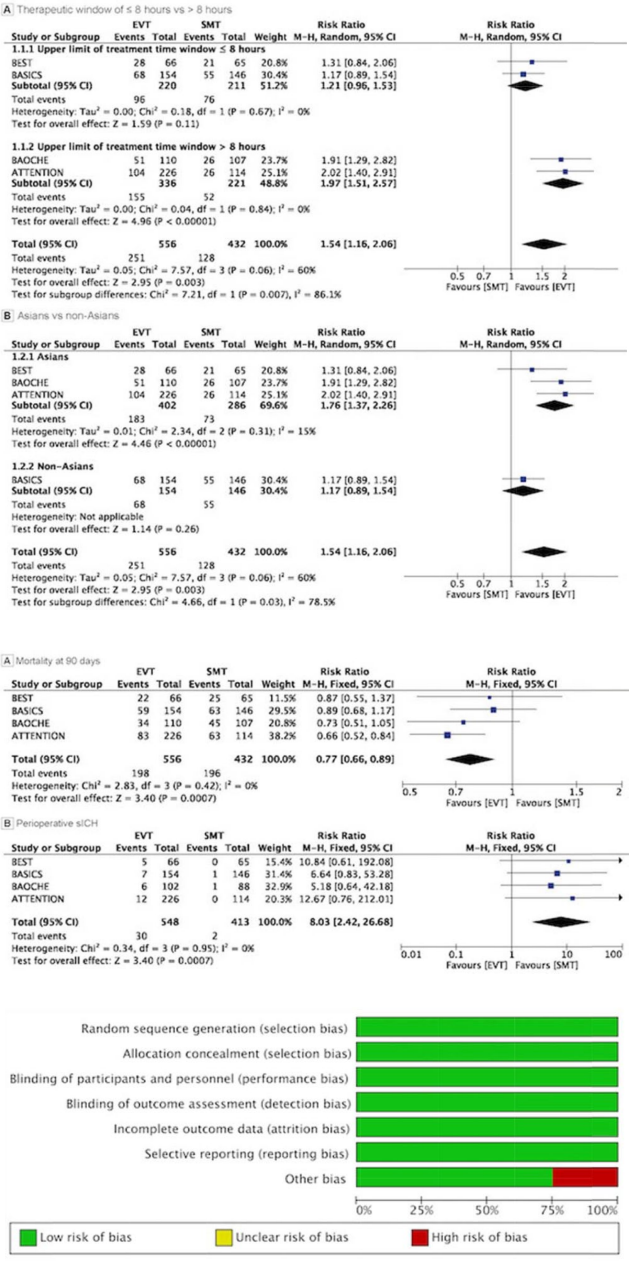
Background and aims: Acute basilar artery occlusion (BAO) is an important cause of acute ischemic stroke, which is considered a neurological catastrophe. Between endovascular thrombectomy (EVT) and standard medical therapy (SMT), the optimal one for BAO is controversial. We conducted a systematic review and meta-analysis of randomised controlled trials (RCTs) to compare the efficacy and safety of EVT to SMT for acute BAO.
Methods: Major databases including MEDLINE, EMBASE, CENTRAL and WHO trial register were searched for RCTs that directly compared EVT to SMT for patients with BAO. The primary outcome was 90-day modified Rankin Scale (mRS) score of 0–3. The secondary outcomes mainly included 90-day mortality and perioperative symptomatic intracranial hemorrhage (sICH).
Results: Four multicenter RCTs (the BEST, BASICS, BAOCHE and ATTENTION trial) involving 988 patients, 556 in the EVT group and 432 in the SMT group, were included. Compared with SMT, patients received EVT showed significantly better functional outcomes on 90-day mRS 0–3 (RR, 1.54 [95% CI, 1.16–2.06]; P = 0.003; high quality of evidence), lower 90-day mortality (RR, 0.77 [95% CI, 0.66–0.89]), and higher risk of perioperative sICH (RR, 8.03 [95% CI, 2.42–26.68]). The findings of subgroup analyses by therapeutic window and race may partially explain the heterogeneity among studies. (see Figures)
Conclusions: For patients suffering acute BAO, EVT is observed to be superior to SMT regarding improved functional outcomes and lower 90-day mortality. Meanwhile, prevention of sICH occurrence is extremely important when patient is managed with EVT.



Disclosure of interest: No

1108

Use of balloon guide catheter versus non-balloon guide catheter during endovascular thrombectomy; a MR CLEAN Registry study

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Background and aims: During endovascular treatment (EVT) for acute ischemic stroke balloon guide catheters (BGC) can be used to prevent distal emboli. Available literature shows some benefits of a BGC. However, BGCs are not universally used during EVT. This study aimed to compare functional, safety, and technical outcomes between patients treated with a 6Fr non-BGC, an 8Fr non-BGC, and a BGC during EVT.
Methods: Patients from the MR CLEAN Registry who received EVT with a 6Fr non-BGC, 8Fr non-BGC, or a BGC are included. Primary outcome was the mRS score at 90 days. Secondary outcomes included procedure time, first attempt successful reperfusion, final successful reperfusion (eTICI⩾2B), mortality at 90 days, and symptomatic intracranial hemorrhage (sICH). Regression analyses were adjusted for variables based on literature and baseline characteristics.
Results: In total 2808 patients are included, 1671 (60%) patients are treated with a BGC. Preliminary analyses show no differences in functional outcome between the groups. The 6Fr non-BGC achieved higher complete reperfusion rates (aOR:1.21, 95%CI:1.00–1.46) and shorter procedure time (aβ:-3.05, 95%CI:-6.02 - -0.08) compared to the BGC. The 8Fr non-BGC resulted in lower first-attempt successful revascularization rates (aOR:0.70, 95%CI:0.54-0.91) compared to BGC.
Conclusions: In this large prospective multicenter registry of patients treated with EVT for ischemic stroke, no significant differences were seen in clinical functional outcome between non-BGC and the BGC. Although first-attempt successful revascularization was better with an 8Fr BGC compared to 8Fr non-BGC, the 6Fr non-BGC showed better reperfusion rates and faster procedures compared to the BGC.
Disclosure of interest: No

1117

Endovascular therapy in patients with internal carotid artery occlusion and patent circle of Willis: Insights from the German Stroke Registry (GSR-MT)

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Background and aims: Endovascular therapy (EVT) is the standard treatment for patients with terminal internal carotid artery occlusion (ICA-T). However, evidence regarding treatment of both intra- or extracranial ICA occlusion but patent circle of Willis (ICA-I/ICA-E) is scarce. We aimed to analyze technical and functional outcomes of patients who received EVT for ICA-T, ICA-I or ICA-E occlusion, respectively.
Methods: Patients were gathered from the large, multicenter, prospective German Stroke Registry (GSR-MT) and stratified for ICA occlusion site (ICA-T/ICA-I/ICA-E). Baseline factors, procedural variables, technical (mTICI) and functional outcomes (modified Rankin scale (mRS) at three months) were analysed using regression analyses adjusted for age, sex, NIHSS, thrombolysis, $mRS_{preStroke}$, witnessed symptom onset, Alberta Stroke Program Early CT Score (ASPECTS) and stroke etiology.
Results: In the GSR-MT, one in five patients had a non-tandem ICA occlusion (2,588/13,082), stratified as ICA-T (n=1946 (14.9%)), ICA-I (n=366 (2.8%)) and ICA-E (n=276 (2.1%)). Patients differed in age (77 vs. 76 vs. 74 years, p=0.04), sex (53.4 vs. 48.9 vs. 43.1% female, $p<0.01$) and stroke severity ($NIHSS_{admission}$: 17 vs. 14 vs. 13 points, $p<0.001$). When compared with ICA-T, both ICA-I and ICA-E occlusions had lower rates of successful recanalization (mTICI2b/3: 85.4 vs. 80.4 vs. 76.3%; $aOR_{I\_vs\_T}$ 0.71 [0.53 – 0.95]; $aOR_{E\_vs\_T}$ 0.57 [0.42 –0.78]). Moreover, ICA-E occlusion was independently associated with worse functional outcome (mRS ordinal shift, $cOR_{E\_vs\_T}$ 0.70 [0.52 – 0.93]).
Conclusions: Patients' characteristics and outcomes differ according to ICA occlusion site. Our results indicate a need to improve treatment strategy in patients with ICA-E occlusion.
Disclosure of interest: No

HEMORRHAGE AND THROMBOSIS DAY 1

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Exploring Hematoma Expansion Shift with Recombinant Factor VIIa: A Pooled Analysis of Four Randomized Controlled Trials

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Background and aims: Hematoma expansion shift (HES) analysis can be used to assess the biological effect of a hemostatic therapy for intracerebral hemorrhage (ICH). In this study we applied HES analysis to individual patient data from four randomized controlled trials evaluating recombinant Factor VIIa (rFVIIa).
Methods: We generated polychotomous strata of HES using absolute growth (⩽0mL/<6mL/⩾6mL) and quintiles of percentile volume change. The relationship between treatment and HES was assessed using proportional odds models. Treatment effect differences in subgroups based on baseline volume (⩾ and <20mL) and time from symptom onset to treatment (⩽ and >2 hours) were explored with interaction testing.
Results: The primary analysis included 721 patients. At 24 hours, 25% of placebo treated patients exhibited no hematoma growth compared to 36% treated with rFVIIa. Significant expansion (⩾6mL) was reduced by 10% in those treated with rFVIIa (acOR:0.57, 95% CI:0.43-0.75). An examination of percentile change showed a shift across the spectrum of expansion (acOR:0.61, 95% CI:0.47-0.80). Differences in absolute HES were more pronounced in patients with baseline ICH ⩾20 mL (acOR:0.48, 95% CI:0.30-0.76) compared to patients with <20 mL volume (acOR:0.67, 95% CI:0.47-0.95, $p_{interaction}= 0.02$). Absolute HES was observed in patients treated with rFVIIa both within (acOR:0.42, 95% CI:0.19-0.91) and after (acOR:0.59, 95% CI:0.44-0.79, $p_{interaction}=0.30$) 2 hours from symptom onset.
Conclusions: rFVIIa is associated with stabilization across the spectrum of hematoma expansion. The treatment effect is most pronounced in patients with larger baseline volumes and shorter times to treatment.
Disclosure of interest: No

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EFFECT OF THE ORAL FACTOR XIA INHIBITOR ASUNDEXIAN IN PATIENTS WITH NON-CARDIOEMBOLIC ISCHEMIC STROKE AND CEREBRAL MICROBLEEDS: SECONDARY ANALYSIS OF THE PACIFIC-STROKE TRIAL

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Background and aims: Cerebral microbleeds predict recurrent stroke and intracranial hemorrhage(ICrH). We report for the first-time interactions between microbleeds and the effects of an oral factor-XIa inhibitor (asundexian), which is hypothesized to inhibit thrombosis without compromising hemostasis.

Methods: Subgroup analyses of the PACIFIC-Stroke phase 2b double-blind randomized trial comparing asundexian (10/20/50 mg daily) vs. placebo in addition to standard antiplatelet therapy in patients with non-cardioembolic ischemic stroke were performed. Microbleeds were centrally adjudicated in patients with interpretable T2*-GRE/SWI sequences available on baseline (n=1746) and follow-up (n=1507; 13-26 weeks) MRIs. Adjusted Cox proportional hazards or regression models were used to estimate the contribution of microbleeds to risk of recurrent stroke, ischemic stroke/TIA, ICrH, all-cause mortality, hemorrhagic transformation (HT) of the qualifying infarct, and new microbleeds.

Results: At study entry, microbleeds were present in 34% (n=604) of the population. During a median follow-up of 10.6 months, 5.7% of participants had recurrent stroke, 7.0% ischemic stroke/TIA, 0.5% ICrH, and 2.2% died. New microbleeds developed in 10.3% and HT in 31.4%. The presence of microbleeds was associated with a 1.5-fold increased risk of HT(aOR 1.6, 95%CI 1.2-2.1), and a 4.5-fold elevated risk of new microbleeds(aOR 4.4, 95%CI 3.0-6.3). There were no interactions between microbleeds and treatment assignment for any of the outcomes. The rate of new microbleeds was similar between asundexian (10.2%) and placebo (10.5%) treated participants.

Conclusions: Factor XIa inhibition with asundexian seems to be safe in patients with non-cardioembolic ischemic stroke and hemorrhage-prone cerebral small vessel disease marked by microbleeds on MRI.

Disclosure of interest: Yes

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ETIOLOGY OF PRIMARY CEREBELLAR INTRACEREBRAL HEMORRHAGE BASED ON TOPOGRAPHIC LOCALIZATION

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Background and aims: Primary cerebellar intracerebral hemorrhage (cICH) is considered primarily hypertensive. However, a recent study suggests that superficial cICH might be secondary to cerebral amyloid angiopathy (CAA). Our objective was to examine whether cICH location is associated with a specific subtype of cerebral small vessel disease (cSVD): CAA or hypertensive arteriopathy.

Methods: We performed a retrospective analysis of consecutive patients with cICH admitted to our center and had MRI between 2000-2022. cICH location was defined as strictly superficial (cortex, surrounding white matter, vermis), deep (deep white matter and nuclei), or mixed (both regions). Patients were divided into superficial or deep/mixed cICH. MRIs were rated for markers of cSVD. We assigned possible/probable vs absent CAA using Boston criteria 2.0.

Results: We included 110 patients (59[53.6%] females, 70.3[±12.9] years). 29(26.4%) patients had superficial cICH; 81(73.6%) had deep/mixed cICH. Superficial cICH patients were significantly more likely to have possible/probable CAA (14[48.2%] vs 7[8.6%], $p<0.001$). Superficial cICH had higher frequency of strictly lobar cerebral microbleeds (51.7% vs 6.2%, $p<0.001$) and cortical superficial siderosis (13.8% vs 1.2%, p=0.02). Deep/mixed cICH had higher frequency of deep/mixed cerebral microbleeds (59.2% vs 3.4%, $p<0.001$), lacunes (54.9% vs 17.2%, $p<0.001$), severe enlarged perivascular spaces in the basal ganglia (36.6% vs 7.1%, p=0.003) and history of hypertension (85.4% vs 56.7%, p=0.004).

Conclusions: Our results suggest that topographic localization within the cerebellum might be associated with different underlying pathophysiologic processes: superficial cICH is more likely to be associated with CAA whereas deep/mixed cICH is almost exclusively linked to hypertensive arteriopathy.

Disclosure of interest: No

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HAEMORRHAGIC COMPLICATIONS AFTER THROMBECTOMY FOR ANTERIOR CIRCULATION STROKE IN SWEDEN 2015-2020

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Background and aims: Intracerebral haemorrhages (ICH) are a feared and severe complication of endovascular thrombectomy (EVT). This study aimed to analyse the difference in bleeding location and severity between occlusion sites.

Methods: All patients with anterior circulation large vessel occlusion stroke registered in the two Swedish national quality registers for stroke care and endovascular therapy during 2015-2020 were included. Haemorrhagic complications identified on imaging within 36 hours post-EVT were classified according to HBC and further divided as symptomatic (sICH) or not symptomatic (non-sICH).

Results: 3153 patients were included. The frequency of any haemorrhage was 26.5%, including 5.4% sICH. SAH was the most frequent subtype of haemorrhage (8.7%). The haemorrhagic subtypes differed between the occlusion sites ($p<0.001$) but the frequency of any ICH did not. EVT in and beyond the M2 more often resulted in SAH and HI1, frequently classified as non-sICH. EVT in the ICA was associated with severe haemorrhages such as IVH and PH2, more often classified as sICH. M1-occlusions showed the lowest frequency of sICH and any haemorrhage. In a multivariable logistic regression analysis, factors associated with higher risk of sICH was ICA-occlusions, diabetes, anticoagulants, ASPECT 0-4, IVT and failed recanalization.

Conclusions: In this nationwide unselected EVT cohort we found significant differences in haemorrhage frequency and severity between occlusion sites. EVT in the ICA resulted in more severe haemorrhages while haemorrhages in and beyond the M2 more often resulted in non-sICH.

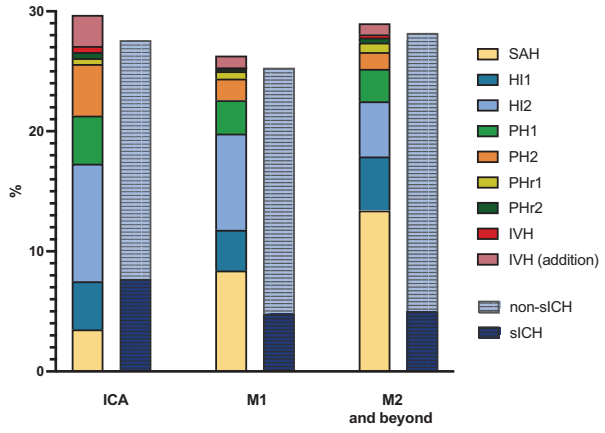

Fig 1a. Frequency of ICH in relation to occlusion site.

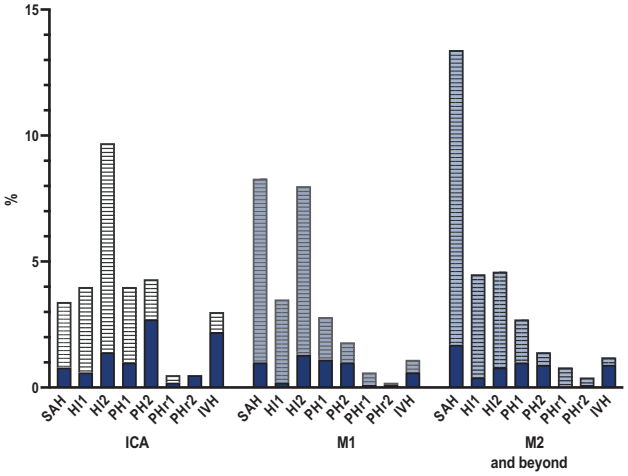

Fig 1b. Frequency of sICH within ICH-subtypes.

Disclosure of interest: No

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HAEMOSTATIC THERAPIES FOR STROKE DUE TO ACUTE, SPONTANEOUS INTRACEREBRAL HAEMORRHAGE – AN UPDATED COCHRANE SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and aims: Early haemostatic therapy might improve outcome after acute stroke due to spontaneous ICH (sICH) by limiting ICH expansion.
Methods: We searched CENTRAL, MEDLINE, EMBASE and clinical trials registers in September 2022. We included randomised controlled trials (RCTs) investigating efficacy and safety of haemostatic therapies versus placebo, open control, or active comparators in adults with acute sICH. The primary outcome was death or dependence (modified Rankin Scale [mRS] 4-6) by day 90. We used random effects models to pool studies.
Results: We included 20 RCTs involving 4654 participants. For recombinant factor VIIa versus placebo/open control for sICH with or without surgery there was little to no difference in the primary outcome (risk ratio [RR] 0.88, 95% CI 0.74 to 1.05). For antifibrinolytic drugs versus placebo/open control for sICH there was no difference in the primary outcome (RR 1.00, 95% CI 0.93 to 1.07). Platelet transfusion likely increases death or dependence by day 90 compared to open control for antiplatelet-associated sICH (RR 1.29, 95% CI 1.04 to 1.61). For prothrombin complex concentrate (PCC) versus fresh frozen plasma (FFP) for anticoagulant-associated sICH we found little to no difference in the primary outcome, but the evidence is very uncertain (RR 1.21, 95% CI 0.76 to 1.90).
Conclusions: Platelet transfusion seems inferior to standard care for reducing death or dependence after antiplatelet-associated sICH, but uncertainty remains about the effects of clotting factor concentrates, antifibrinolytic drugs and reversal agents, which are being addressed by 13 ongoing RCTs.
Disclosure of interest: Yes

1213

Clinical outcomes of Asian vs. non-Asian people after acute intracerebral haemorrhage: secondary analysis of individual participant data from the Blood pressure in Acute Stroke Collaboration (BASC)

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Background and aims: Regional differences in clinical outcomes after acute intracerebral haemorrhage (ICH) are poorly understood.
Methods: Post-hoc analysis of individual participant data from the Blood pressure in Acute Stroke Collaboration (BASC). Generalised linear mixed models were used to compare clinical outcomes (haematoma expansion at 24 hours, neurological deterioration at 7 days and modified Rankin Scale scores [mRS] at 90-day) of people with ICH recruited in Asia vs. elsewhere, adjusted for trial and potential confounders. We also compared factors associated with poor functional outcome (mRS 3-6) in participants recruited in Asia vs. elsewhere.
Results: Among 6221 participants, 56.2% were recruited in Asia. Compared with participants recruited elsewhere, those recruited in Asia were younger, had higher baseline NIHSS scores, were more likely to have history of hypertension and previous stroke, and were less likely to have lobar or intraventricular haemorrhage. Participants recruited in Asia had lower risk of neurological deterioration (adjusted odds ratio [aOR] 0.76,

95% confidence interval [CI] 0.59-0.97), death or dependency (aOR 0.53, 95% CI 0.42-0.67), death (aOR 0.74, 95% CI 0.57-0.69) and any serious adverse events (aOR 0.49, 95% CI 0.41-0.59). There was no difference in haematoma expansion at 24 hrs (aOR 0.90, 95% CI 0.72-1.12). Factors associated with poor functional outcome did not differ between participants recruited in Asia vs. elsewhere.
Conclusions: Although prognostic factors were similar among participants recruited in Asia vs elsewhere, participants from Asia were younger and had lower risk of neurological deterioration and poor functional outcome.
Disclosure of interest: No

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CHALLENGES IMPLEMENTATING A GOAL-DIRECTED CARE BUNDLE FOR INTRACEREBRAL HAEMORRHAGE: DEEPER INSIGHTS INTO THE INTERACT3 TRIAL

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Background and aims: INTERACT3 was an international, multicentre, stepped-wedge cluster randomised trial that evaluated the effectiveness of a goal-directed care bundle protocol (interventions for blood pressure control, glycaemic control, treatment of pyrexia and reversal of anticoagulation) in acute intracerebral haemorrhage (ICH) at 122 hospitals in 9 low- and middle-income countries and 1 high-income country. The main results are presented at ESOC 2023. An embedded process evaluation (PE) aimed to explore the uptake and implementation of the protocol as part of routine care.
Methods: Mixed-methods study to evaluate implementation of interventions through interviews and focused group discussions at 18 purposively sampled hospital sites. Observational records, surveys, routine monitoring data, and field notes provided contextual information to assist evaluation of intervention performance. Stakeholders included department directors, physicians, nurses and patients.
Results: 51 interviews, 6 focus group discussions, and 62 quantitative clinician surveys were completed in 2019-2022. In general, the care bundle was delivered as planned and acceptable by doctors and nurses, but difficulties were reported in reaching BP and glycaemic targets. Contextual factors included limited staff and intravenous antihypertensive drugs, and delays in diagnosis and triage of patients. Areas to facilitate implementation include optimising workflow and communications, upskilling team care, and training and feedback.
Conclusions: The PE provides insights into implementation challenges in a global context and aid understandings of the interactions between specific intervention elements and patient outcomes.
Disclosure of interest: No

1332

HAVE OUTCOMES FOR INTRACEREBRAL HAEMORRHAGE IN THE UK IMPROVED? 10-YEAR DATA FROM THE NATIONWIDE STROKE REGISTRY

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Background and aims: Intracerebral haemorrhage (ICH) accounts for 12% of admitted stroke in England, Wales, and Northern Ireland. Over the past 10 years the Sentinel Stroke National Audit Programme (SSNAP) has prospectively collected clinical audit data including outcomes for ICH patients. We examined how these outcomes have changed over the past 10 years when compared to ischaemic stroke.
Methods: The data was collected by SSNAP through its continuous clinical audit covering 158 in-patient stroke teams using an online proforma with in-built validations to ensure accuracy and complete case ascertainment.
Results: Between 2013-2022, 98,225 ICH patients were admitted representing 12% of all strokes. Pre-stroke disability (modified Rankin Scale (mRS) scores) has increased over the period for both ICH (20-23%) and ischaemic (18-20%) stroke admissions. The stroke unit as first ward of admission for ICH has risen by 12% to 78%. Independent outcomes (discharge mRS scores 0-2) have fallen 4% for ICH (29%-25%) and 10% for ischaemic stroke. However, in-hospital mortality for ICH has fallen by 4% (33%-29%, $P<0.0001$) compared to 2% for ischaemic strokes (12-10%, $P<0.0001$). The percentage of ICH patients discharged to a care home fell (11%-7%) but remains higher than ischaemic (6%).
Conclusions: Over the last 10 years, in-hospital mortality and institutionalisation rates for ICH have fallen significantly but remain much higher than for ischaemic stroke. The increase in specialist stroke unit access is likely to have contributed to these ICH outcomes. Improvements in the management of acute ICH to improve survival and reduce disability remain an urgent priority.
Disclosure of interest: No

1410

Sex differences of MRI predictors for intracranial hemorrhage in oral anticoagulant users

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Background and aims: Sex differences in MRI risk factors for intracranial hemorrhage (ICrH) are not well-known. We investigated sex specific risk factors associated with ICrH by evaluating MRI surrogate markers of hemorrhagic-prone cerebral angiopathies.
Methods: Subgroup analysis of "intracerebral hemorrhage due to oral anticoagulants: Prediction of the risk by magnetic resonance" (NCT02238470), a multicenter (n=30) and prospective observational study (April2012-September2017). Patients were $\geqslant$65 years, had a recent cardioembolic stroke, were new oral anticoagulants users, and were followed-up prospectively by telephone interview up to 24-months. We evaluated microbleeds (presence/burden/localization), and white matter hyperintensities (WMH) with Fazekas scale at baseline by MRI. We collected demographic, clinical, and radiological data. Primary endpoint was ICrH during follow-up. We performed multivariable Cox regression analyses stratified by sex.
Results: We recruited 488 women (age 78.1$\pm$6.5 years), 124[25.4%] had microbleeds, and 218[44.7%] had moderate/severe WMH; and 449 men (age 77.0$\pm$6.4 years), 124[27.6%] had microbleeds, and 201[44.8%] had moderate/severe WMH. After a mean follow-up of 23.1$\pm$6.8 months, 18 had an ICrH (8 women/10 men). After an adjustment for age, hypertension, antiplatelet agents, and statins, microbleeds presence (aHR:4.8, 95%

confidence interval [CI]:1.1–20.4, p=0.030) was an independent risk factor for ICrH in women, while moderate/severe WMH (aHR:12.2, 95% CI:1.5–96.8, p=0.017) was a risk factor for ICrH in men.
Conclusions: Risk factors for ICrH in new oral anticoagulant users and recent cardioembolic stroke are different in men and women. Moderate/severe WMH is a predictor of ICrH in men and microbleeds presence is a predictor of ICrH for women.
Disclosure of interest: No

1418

Combination of Steroid and Anticoagulant Therapy to Treat Acute/Subacute Severe Cerebral Venous Thrombosis: results from a retrospective study

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Background and aims: Accumulating evidence suggest that the inflammatory response plays a vital role in regulating severe CVT pathogenesis and is strongly associated with a poor prognosis. However, whether CVT patients can benefit from steroid therapy has been a subject of considerable debate. We explored the potential efficacy and safety of steroids combined with anticoagulant therapy in acute/subacute severe CVT patients.
Methods: We retrospectively reviewed data of patients with acute/subacute severe CVT treated with or without 500 mg methylprednisolone pulse therapy for 3 days. We compared functional outcomes and major adverse events 6 months after discharge between the steroid and nonsteroid groups using propensity score(PSM).
Results: 248 patients with acute/subacute severe CVT were included, and 93 (37.50%) patients were treated with steroids. After PSM, there were 85 patients each in the steroid and nonsteroid groups. Patients in the steroid group had higher mRS scores(0-2) (85.88% vs. 71.76%, P=0.03) than the nonsteroid group at the 6-month follow-up. Regarding steroid safety, the likelihood of CVT recurrence, lower extremity deep venous thrombosis, pulmonary embolism, infection, and mortality did not differ significantly between both groups. Multiple regression analysis showed that steroid treatment(OR: 4.685, 95% CI: 1.629-13.476, P<0.01) was independently associated with favorable outcomes in the matched cohort. Patients treated with steroids did not experience spontaneous fractures, osteonecrosis, or gastroduodenal ulcers.
Conclusions: Steroid pulse therapy combined with anticoagulant therapy may be effective and safe for improving the prognosis of patients with acute/subacute severe CVT. However, the findings need to be further verified using prospective research.
Disclosure of interest: Yes

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Clinical characteristics of posterior circulation stroke in adult patients with Moyamoya disease; a study from multicenter registry

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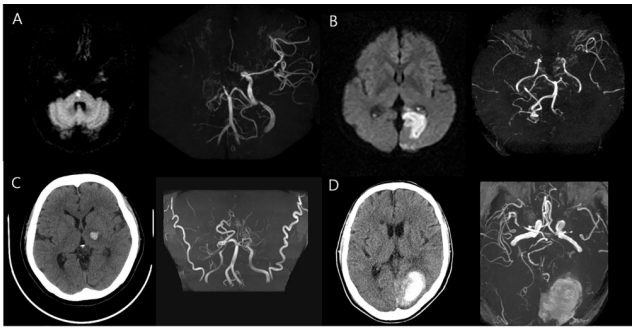
Background and aims: The presence of posterior cerebral artery (PCA) steno-occlusive lesions are not included in the diagnostic criteria of moyamoya disease. However, PCA involvement is an adverse prognostic marker for outcome in moyamoya disease. Our study was to investigate the prevalence and clinical characteristics of post circulation stroke in adult moyamoya disease.
Methods: From Jan 2001 to Jun 2021, we included the patients who was confirmed as symptomatic stroke and moyamoya disease from moyamoya registries of 4 hospitals in Korea. Infarct and hematoma patterns were categorized into 5 groups: (1) small (<2cm) deep infarcts restricted to the territory of penetrating arteries, (2) large cortical/subcortical infarcts, (3) deep intracerebral hemorrhage (ICH) with or without intraventricular hemorrhage (IVH), (4) lobar ICH with or without IVH (5) subarachnoid hemorrhage (SAH) or IVH only. In addition, we compared demographic and clinical characteristics of anterior and posterior circulation stroke.
Results: A total of 351 moyamoya patients (215 ischemic, 132 hemorrhagic, and 4 both) were included. Thirty-four patients (15.8%) had posterior circulation infarction (9 small deep vs. 25 large cortical/subcortical). Twenty patients (15.2%) had posterior circulation hematoma (18 deep vs. 2 lobar). Clinical characteristics were not significantly different between anterior and posterior circulation stroke. However, women were more prevalent in posterior hemorrhagic stroke (18/20, 90.0%) rather than anterior hemorrhagic stroke (41/63, 65.1%). (p=0.032)
Conclusions: Approximately 15% of patients with moyamoya disease experience a posterior circulation stroke as their first vascular event. These patients need different treatment strategies depending on the vascular condition and stroke patterns.



Disclosure of interest: No

IMAGING DAY 1

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Comparison of intravenous thrombolysis and mechanical thrombectomy versus thrombectomy alone in fast and slow stroke progressors - Insights from the SWIFT-DIRECT trial

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Background and aims: The speed of infarct growth may influence the effect of reperfusion therapies among slow or fast progressors. We aimed to investigate the treatment effect of intravenous alteplase (IVT) plus mechanical thrombectomy (MT) versus MT alone in slow versus fast progressors.
Methods: We performed a subanalysis of the SWIFT-DIRECT trial which included 408 patients at 48 sites. Infarct growth was defined as initial ASPECTS point decay divided by onset-to-imaging time. Patients with missing imaging time (n=32) or ASPECTS (n=1) were excluded. The primary study endpoint was the proportion of patients with a 3-month modified Rankin scale 0-2. The primary analysis dichotomized the population in slow and fast progressors from the median infarct growth velocity (ASPECTS point decay/hour).
Results: We included 376 patients[191 IVT+MT,185 MT; median age 73(IQR=65-81)]. The median infract growth velocity was 1.2point/hour. We did not observe an interaction between the infarct growth speed and the allocation to either IVT+ MT or MT alone on the odds of favorable outcome (p=0.68). In the IVT+MT group, the rate of any ICH was significantly lower in slow progressors (22.8 vs 36.4%; OR=0.52, 95%CI 0.27-0.98) and higher among fast progressors (49.4 vs 26.8%;OR=2.62,95%CI 1.42-4.82)(p-value for interaction $<$0.001). Similar results were observed in secondary analyses.
Conclusions: In this SWIFT-DIRECT subanalysis, no significant influence of the infarct growth velocity on the odds of favourable outcome with strata of IVT was observed. However, IVT+MT was associated with a reduced ICH risk among slow progressors while increasing the risk in fast progressors.
Disclosure of interest: No

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Longitudinal follow-up of tau accumulation 6 months and 2 years after ischemic stroke: a 18F-MK-6240 PET/MR study

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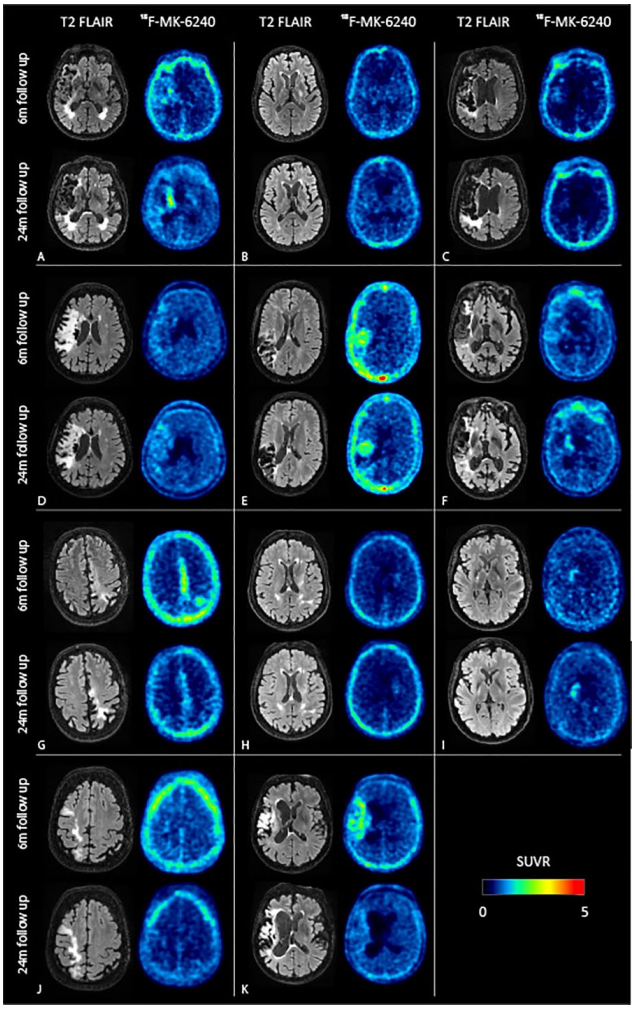
Background and aims: Epidemiological studies report an increased risk of Alzheimer disease (AD) after ischemic stroke, possibly explained by formation of neurofibrillary tangles (NFT) after stroke. ^{18}F-MK-6240 is a PET tracer that specifically binds to NFT enabling in vivo study of their accumulation. We previously demonstrated increased ^{18}F-MK-6240 uptake within and surrounding the ischemic lesion 6 months after stroke. The aim of current study was to investigate 2-year longitudinal evolution of NFT-accumulation after stroke by consecutive ^{18}F-MK-6240 PET/MR imaging.
Methods: We analyzed 11 patients (age: 65±15 years, 4M/7F) who underwent ^{18}F-MK-6240 PET/MR 6.0 (IQR: 5.8-6.4) months and 24.0±0.6 months after ischemic stroke. We calculated partial volume corrected standardized uptake value ratios (SUVR) relative to cerebellar cortex and longitudinally studied ^{18}F-MK-6240 SUVR in the ischemic lesion, 3 near to more remote peri-ischemic areas, both hemispheres and brain regions with known early tau accumulation in AD.
Results: ^{18}F-MK-6240 binding evolved heterogeneously over time with both focal increases in some and decreases in other patients at 2-year follow-up (see Figure). We demonstrated a global decrease of ^{18}F-MK-6240 SUVR in the ipsilesional hemisphere at 2 years compared to 6 months after stroke (deltaSUVR = -0.06, p=0.04). There was no increase in ^{18}F-MK-6240 binding in brain areas known to be affected with early tau accumulation in AD.
Conclusions: Tau NFT-accumulation is variable between subjects in the chronic phase after ischemic stroke, without distant spreading after two years. Whether such neurofibrillary tangle seeds progress spatially or evolve to more extended Alzheimer disease patterns needs further follow-up.



Disclosure of interest: No

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Retinal microvasculature as an in-vivo biomarker of TIA and minor ischemic stroke: first insights from the REMARK-TIA study

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Background and aims: retinal small vessels show close anatomical and physiological parallels with brain microvasculature. We aimed to investigate whether retinal vessels may serve as an *in-vivo* biomarker of TIA and minor ischemic stroke (MIS).

Methods: cross-sectional study enrolling consecutive TIA/MIS (NIHSS $\leq$5) referred to two Northern-Italy emergency departments (Bologna, Ravenna). Retinal microvasculature was assessed qualitatively through dilated ocular fundus photography (DOFP) and quantitatively through optical coherence tomography angiography (OCTA) within 10 days from onset. Findings were compared with controls without prior cerebrovascular events.

Results: a total of 86 patients (53.4% TIA, 46.6% MIS; N_{eyes}=171) and 36 controls (N_{eyes}=72) were included. TIA/MIS were more frequently male (69.8% vs. 38.9%; p=0.012) and had higher risk factors (BMI, p=0.002; hypertriglyceridemia, p=0.012; alcohol consumption, p=0.033). After adjusting for sex and risk factors, microvascular abnormalities at DOFP were significantly more frequent in TIA/MIS (OR 4.9, 95%CI 1.4-16.8; p=0.012), especially arterial narrowing, arteriovenous nicking and enhanced arteriolar reflex. OCTA showed significantly larger foveal avascular zone (FAZ; generalized linear model: β=0.10, 95%CI 0.07-0.13; p$<$0.001) and reduced whole-image superficial and deep choroid plexus density (wi-SCP/DCP; β=-2.01, 95%CI -3.96 -0.06; p=0.043 and β=-5.29, 95%CI -7.39 -3.20; p$<$0.001) in TIA/MIS (N_{eyes}=93) vs. controls (N_{eyes}=72). $ABCD_2$ negatively correlated with wi-SCP (β -1.90; p$<$0.001) and wi-DCP (β -1.15; p=0.045). Small artery occlusion (SAO)-related TIA/MIS (N_{eyes}=41) showed higher FAZ (p=0.013) and lower wi-DCP (p$<$0.001) compared to other etiologies (N_{eyes}=130).

Conclusions: retinal small vessels, as assessed by DOFP and OCTA, may represent an *in-vivo* biomarker of TIA/MIS, especially with SAO-related etiology.

Disclosure of interest: No

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EARLY PENUMBRAL FLAIR CHANGES PREDICT TISSUE FATE IN PATIENTS WITH LARGE VESSEL OCCLUSIONS

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Background and aims: We aimed to determine if the MRI defined penumbra includes irreversible neuronal loss that impedes expected clinical recovery after reperfusion.
Methods: In a multicenter cohort of patients with endovascular treatment for large-vessel-occlusion, we quantified fluid-attenuated inversion recovery (FLAIR) changes in the perfusion-weighted imaging (PWI)- diffusion-weighted imaging (DWI) penumbra. We analyzed the 1) correlation between severity of hypoperfusion and penumbral FLAIR changes at baseline, 2) influence of recanalization status on the evolution of penumbral FLAIR changes and 3) baseline penumbral FLAIR changes to predict tissue fate (infarction versus salvage) at 24h and functional outcome (modified Rankin Scale at 90d).
Results: Severity of hypoperfusion correlated with relative FLAIR signal intensity (rFLAIR SI) in the baseline penumbra (Spearman correlation coefficient 0.04, 95%CI 0.03-0.05, p<0.0001, n=209). Median rFLAIR SI was elevated in the penumbra at baseline (1.03 IQR 1.00–1.08) and 24h (1.03 IQR 1.01–1.07). Recanalization status did not modify the evolution of rFLAIR SI over time. Among patients who recanalized (n=150) median rFLAIR SI was higher at baseline in penumbral tissue that went on to infarction (1.07, SD 0.07) compared to penumbral tissue that was salvaged (1.03, SD 0.06 p<0.0001, n=150). Severity and extent of rFLAIR SI changes in the penumbra did not predict functional outcome in univariate (p=0.09) and multivariate logistic regression (p=0.4).
Conclusions: The PWI-DWI penumbra is characterized by increases in FLAIR signal, which correlate with the severity of hypoperfusion. rFLAIR SI changes in the baseline penumbra predict tissue fate, but not functional outcome.
Disclosure of interest: No

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Clinical Relevance of Plaque Distribution based on High-Resolution Magnetic Resonance Imaging for Basilar Artery Stenosis

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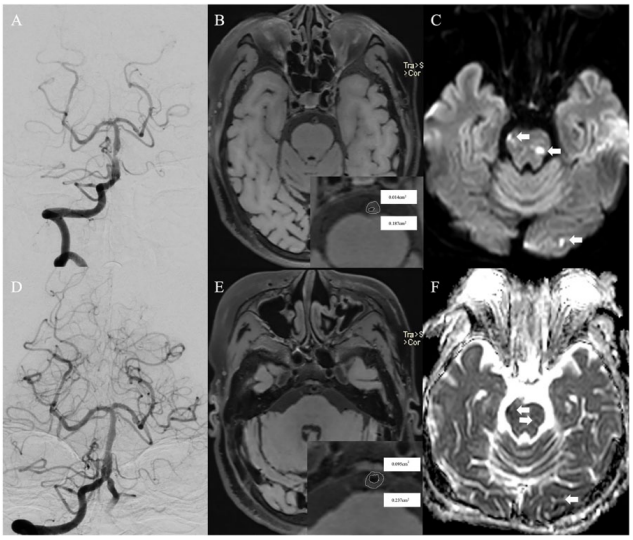
Background and aims: The association between plaque distribution and postoperative complications is unclear in patients with basilar artery (BA) atherosclerotic stenosis. This study investigated the correlation between plaque distribution and postoperative complications after endovascular treatment in BA stenosis.
Methods: We enrolled patients with severe BA stenosis undergoing high-resolution magnetic resonance imaging (HR-MRI) and digital subtraction angiography (DSA) before intervention. Based on the results of HR-MRI, plaques were classified according to the extent to which they involved the ventral, lateral, dorsal, or two quadrants of the BA wall. Plaques were also classified based on their involvement in the proximal, distal, or junctional segment of the BA based on DSA. Using magnetic resonance imaging, an experienced independent team assessed ischemic events after intervention. An analysis of the relationship between plaque distribution and postoperative complications was conducted.
Results: 140 eligible patients were included with 11.4% rate of postoperative complications. The average age of these patients was 61.9±7.7 years old. Most plaques were found in the dorsal wall (34.3%) and in the region distal to the anterior inferior cerebellar artery (AICA) (60.7%). Postoperative complications of endovascular treatment were associated with plaques located at the lateral wall (OR 4.00, 95%CI 1.21-13.23, p=0.023) and junctional segment (OR 8.75, 95%CI 1.16-66.22, p=0.036), as well as plaque burden (OR 1.03, 95%CI 1.01-1.06, p=0.042).
Conclusions: Plaques located at the junctional segment and lateral wall of BA with large burden may increase the likelihood of postoperative complications following endovascular therapy. Further studies with a larger sample size are warranted.



Disclosure of interest: No

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Persistent Penumbral Profiles Do Not Guarantee a Good Clinical Outcome in Large Vessel Occlusion Patients Without Major Reperfusion

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Background and aims: It is acknowledged that penumbral tissue can exist beyond 24 hours after stroke onset. The aim of this study was to explore the association between penumbral persistence at 24-72 hours post-hospital arrival and short-term, long-term clinical outcomes in patients who did not achieve major reperfusion.
Methods: Eligible patients participating in the International Stroke Perfusion Imaging Registry with repeat 24-72 hours perfusion imaging were included in this study. Short-term clinical outcomes were defined as neurological deterioration (National Institutes of Health Stroke Scale [NIHSS] increased ⩾4 from baseline) at 24-72 hours and at discharge. Long-term good outcome was defined as 3-month modified Rankin scale (mRS) 0-2. The association between 24-to-72-hour penumbral persistence and different clinical outcomes were explored using univariate analysis and multivariate-adjusted logistic regression models.
Results: A total number of 137 patients with 3-month follow-up records were included in this study. Persistent penumbral existence was not associated with 3-month good clinical outcome (multivariate-adjusted OR=2.8, 95% CI 0.6-12.6, P=0.18). Penumbral persistence at 24-72h post arrival was associated decreased odds of neurological deterioration at 24-72h (multivariate-adjusted OR=0.1, 95% CI 0.03-0.47, P=0.003) but not at discharge (multivariate-adjusted OR=1.4, 95% CI 0.4-5.2, P=0.58).

Conclusions: Persistent penumbra in acute ischemic stroke patients without major reperfusion was associated with a better clinical outcome at 24-72 hours, but not at discharge and 3 months. This evidence suggests that endovascular treatment beyond 24 hours is theoretically beneficial and large randomized trials are needed to prove its safety and efficacy.
Disclosure of interest: Yes

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Association between Morning Blood Pressure Surge and Intracranial Atherosclerotic Plaque characteristics: A High-Resolution Magnetic Resonance Vessel Wall Imaging Study

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Background and aims: Morning blood pressure surge (MBPS) is associated with cardiovascular disease and atherosclerosis. However, the correlation between MBPS and intracranial atherosclerotic plaque characteristics was uncertain.
Methods: 267 ischemic stroke patients with intracranial atherosclerosis were retrospectively analyzed. Sleep-trough and prewaking MBPS were calculated from ambulatory blood pressure monitoring (ABPM). Plaque characteristics, including intraplaque hemorrhage (IPH), maximum wall thickness (max WT), and stenosis degree were obtained from high-resolution vessel wall MR imaging. Linear and logistic regression were used to detect the association between MBPS and plaque characteristics.
Results: Subjects with the top tertile of Sleep-trough MBPS (⩾ 15.1 mmHg) had a lower prevalence (9.1% vs. 19.6%, p=0.029) of severe stenosis (⩾70%) than other subjects. Subjects within the top tertile of prewaking MBPS (⩾ 7.6 mmHg) had a lower percentage of IPH (27.3% vs. 40.4%, p=0.035) than other subjects. After adjusting for stroke risk factors (age, sex, diabetes, smoking, family history, and hyperlipidemia) and 24h mean systolic blood pressure, 10 mmHg sleep-trough MBPS increment was associated with 0.07mm max WT reduction, and the top tertile MBPS group were associated with a lower chance of severe stenosis, OR=0.399, 95% CI (0.172,0.927); Additionally, an increased prewaking MBPS is associated with a lower incidence of IPH, with OR=0.527, 95% CI (0.295,0.944). Subgroup analysis demonstrated that the positive findings could only be seen in non-diabetic subjects.
Conclusions: MBPS is associated with intracranial atherosclerotic plaque burden and vulnerability, and this relationship remains significant in the non-diabetic subgroup.

Table 1. Baseline characteristics of subjects included

Variables	Total (n=267)	Sleep-trough Model					Prewaking Model				
		Top tertile (n=88)	Middle tertile (n=92)	Lowest tertile (n=87)	p value (MS vs. non-MS group)	p value (Among 3 groups)	Top tertile (n=88)	Middle tertile (n=90)	Lowest tertile (n=88)	p value (MS vs. non-MS groups)	p value (Among 3 groups)
Baseline characters											
Age, y	65.4±12.0	65.5±12.4	65.5±12.7	65.0±10.9	0.871	0.939	64.1±12.4	65.0±12.2	66.9±11.4	0.242	0.290
Male	161 (60.3)	48 (54.5)	59 (64.1)	54 (62.1)	0.178	0.388	58 (65.9)	54 (60.0)	49 (55.7)	0.207	0.379
Hypertension	211 (79.0)	72 (81.8)	69 (75.0)	70 (80.5)	0.432	0.491	66 (75.0)	74 (82.2)	70 (79.5)	0.267	0.490
Hypertension Years, y	14.0±11.0	13.1±11.0	13.5±11.2	15.4±11.0	0.404	0.434	12.9±11.0	12.9±10.3	16.3±11.7	0.328	0.109
Anti-hypertensive medication	166 (62.2)	58 (65.9)	50 (54.3)	58 (66.7)	0.377	0.160	51 (58.0)	53 (58.9)	61 (69.3)	0.336	0.225
Diabetes	109 (40.8)	28 (31.8)	33 (35.9)	48 (55.2)	0.036	0.004	30 (34.1)	34 (37.8)	45 (51.1)	0.108	0.053
Hyperlipidemia	92 (34.5)	33 (37.5)	28 (30.4)	31 (35.6)	0.463	0.585	29 (33.0)	31 (34.4)	32 (36.4)	0.694	0.893
Smoking	112 (41.9)	30 (34.1)	41 (44.6)	41 (47.1)	0.068	0.178	39 (44.3)	40 (44.4)	33 (37.5)	0.607	0.564
Drinking	79 (29.6)	18 (20.5)	30 (32.6)	31 (35.6)	0.072	0.221	23 (26.1)	35 (38.9)	21 (23.0)	0.496	0.122
Family stroke history	48 (18.0)	8 (9.1)	22 (23.9)	18 (20.7)	0.008	0.025	18 (20.5)	17 (18.9)	13 (14.8)	0.472	0.599
Hyperhomocysteinaemia	41 (15.4)	12 (13.6)	8 (8.7)	21 (24.1)	0.585	0.014	12 (13.6)	8 (8.9)	21 (23.9)	0.572	0.019
Chronic kidney disease	13 (4.9)	5 (5.7)	3 (3.3)	5 (5.7)	0.665	0.676	5 (5.7)	3 (3.3)	5 (5.7)	0.673	0.702
Atrial fibrillation	17 (6.4)	4 (4.5)	6 (6.5)	7 (8.0)	0.393	0.636	5 (5.7)	4 (4.4)	8 (9.1)	0.740	0.424
Anti-platelet	81 (30.3)	20 (22.7)	33 (35.9)	28 (32.2)	0.058	0.143	22 (25.0)	32 (35.6)	27 (30.7)	0.174	0.310
Statin	70 (26.2)	20 (22.7)	23 (25.0)	27 (31.0)	0.363	0.434	21 (23.9)	22 (24.4)	27 (30.7)	0.523	0.522
Anti-coagulation	5 (1.9)	2 (2.3)	0 (0.0)	3 (3.4)	0.735	0.222	2 (2.3)	2 (2.2)	1 (1.1)	0.740	0.821

The t tests were used for continuous parameters between 2 groups. The ANOVA tests were used for continuous parameters among 3 groups. The χ^2 tests were used for categorical parameters. Continuous parameters were showed as mean±SD. Categorical parameters were showed as number (%). MS, morning surge.

Table 2 BP index and Plaque Characteristics in MS and non-MS group

Variables, n(%) or M±SD	Total (n=267)	Sleep-trough Model			Prewaking Model		
		MS Group (n=88)	non-MS Group (n=179)	p value	MS Group (n=88)	non-MS Group (n=178)	p value
BP parameters							
SBP, mmHg							
24-hour	140.5±16.8	140.1±16.5	140.7±17.0	0.792	140.3±17.2	140.7±16.6	0.851
Awake-time	141.1±16.6	143.1±16.7	140.1±16.5	0.170	144.0±17.2	139.7±16.1	0.045
Asleep-time	139.6±19.6	135.0±18.6	141.8±19.7	0.007	134.0±18.5	142.5±19.3	0.001
Morning	141.3±18.1	147.4±18.2	138.2±17.3	<0.001	147.0±18.7	138.5±17.1	<0.001
Lowest	131.7±19.2	123.9±17.2	135.6±19.0	<0.001	126.4±18.6	134.5±19.0	0.001
Pre-awake	139.4±20.3	135.2±20.0	141.5±20.3	0.019	130.7±18.8	143.7±19.7	<0.001
Morning Surge	*	23.5±8.6	2.6±9.6	<0.001	16.3±6.6	-5.2±10.8	<0.001
DBP, mmHg							
24-hour	79.2±11.6	78.6±12.0	79.4±11.4	0.589	79.5±11.3	79.1±11.7	0.763
Awake-time	80.3±11.8	80.9±12.2	80.0±11.5	0.544	81.8±11.5	79.6±11.8	0.146
Asleep-time	77.2±12.7	74.7±13.2	78.4±12.3	0.026	75.5±12.3	78.1±12.8	0.116
Morning	81.7±12.6	83.5±13.5	80.8±12.1	0.100	84.0±12.6	80.6±12.4	0.041
Lowest	72.3±13.0	68.2±12.9	74.2±12.5	<0.001	70.0±12.6	73.5±13.0	0.038
Pre-awake	75.9±12.8	74.3±14.3	78.2±11.9	0.021	73.7±12.8	78.5±12.6	0.004
Morning Surge	*	15.3±7.1	6.6±7.7	<0.001	10.4±6.9	2.2±7.9	<0.001
Plaque Characteristics							
Max WT, mm	2.48±0.62	2.39±0.60	2.53±0.63	0.079	2.39±0.65	2.52±0.61	0.102
Plaque Count	4.70±3.06	4.52±2.68	4.79±3.28	0.498	4.34±3.09	4.89±3.05	0.172
Vessels involved	3.80±2.16	3.78±2.09	3.80±2.19	0.932	3.52±2.09	3.93±2.19	0.156
IPH	97 (36.3)	29 (33.0)	68 (38.0)	0.421	24 (27.3)	72 (40.4)	0.035
Stenosis degree				0.128			0.131
<30%	70 (26.2)	22 (25.0)	48 (26.8)		29 (33.0)	41 (23.0)	
30%-49%	108 (40.4)	40 (45.5)	68 (38.0)		33 (37.5)	74 (41.6)	
50%-69%	46 (17.2)	18 (20.5)	28 (15.6)		17 (19.3)	29 (16.3)	
≥70%	43 (16.1)	8 (9.1)	35 (19.6)		9 (10.2)	34 (19.1)	
Stenosis degree ≥70%	43 (16.1)	8 (9.1)	35 (19.6)	0.029	9 (10.2)	34 (19.1)	0.064
Plaque distribution				0.580			0.183
Anterior circulation	101 (37.8)	33 (37.5)	68 (38.0)		34 (38.6)	67 (37.6)	
Posterior circulation	8 (3.0)	4 (4.5)	4 (2.2)		5 (5.7)	3 (1.7)	
Anterior+posterior circulation	158 (59.2)	51 (58.0)	107 (59.8)		49 (55.7)	108 (60.7)	

* Whole Group: SBP: Sleep-trough MBPS: 9.5±13.5, Prewaking MBPS: 1.9±13.9, DBP: Sleep-trough MBPS: 9.4±8.5, Prewaking MBPS: 4.9±8.5

The t tests were used for continuous parameters between 2 groups. The χ^2 tests were used for categorical parameters. Continuous parameters were showed as mean±SD. Categorical parameters were showed as number (%). DBP, diastolic blood pressure; IPH, intraplaque hemorrhage; Max WT, maximum wall thickness; MS, morning surge; SBP, systolic blood pressure.

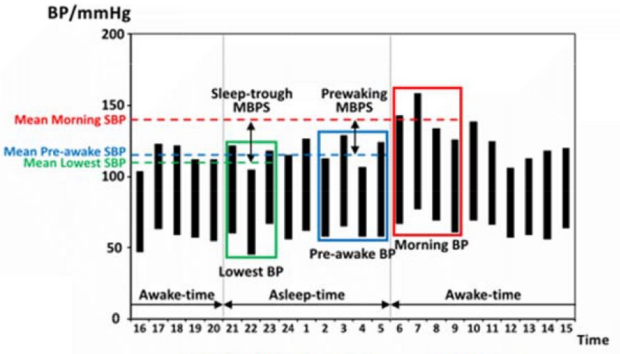

Fig.1 Sleep-trough and prewaking models of MBPS

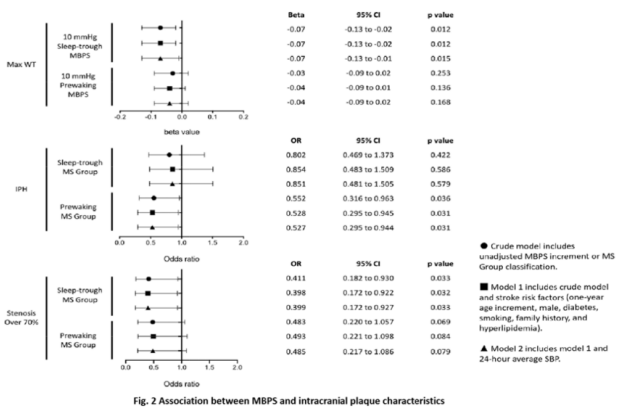

Fig. 2 Association between MBPS and intracranial plaque characteristics

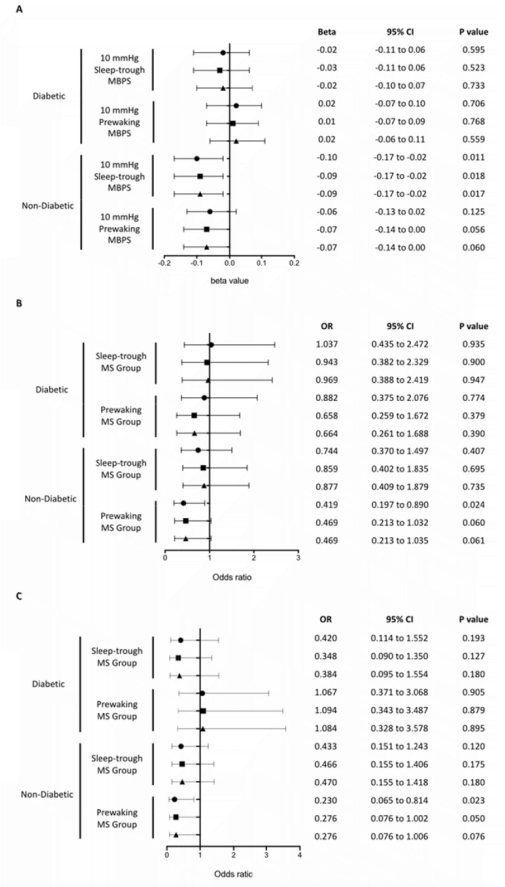

Fig.3 Association between MBPS and intracranial atherosclerotic plaque characteristics in diabetic subgroup

Disclosure of interest: No

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Diffusion-Weighted Image Positivity Predicts Three-Year Risk of Stroke or Death After Transient Ischemic Attack in Biracial Population

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Background and aims: Up to 30% of ischemic strokes are preceded by a transient ischemic attack (TIA). Identification of high risk TIAs could help determine which patients are in greatest need of secondary stroke prophylaxis. Previous studies have suggested that MRI evidence of ischemia following a TIA independently predicts subsequent stroke risk, but this remains unclear. We sought to evaluate whether diffusion-weighed image (DWI) positivity on MRI is a risk predictor of ischemic stroke or death among TIA patients in a large population-based study.

Methods: Using the Greater Cincinnati/Northern Kentucky Stroke Study, a large, biracial population-based study, we identified adults acutely presenting with a TIA between January-December 2015. TIA was defined as neurological dysfunction that resolved in its entirety within 24 hours from onset. Only patients that received an MRI brain within 7 days of the event were included. Patients were then followed over three years to monitor for subsequent stroke or death. Cox proportional hazards models were developed to assess the impact on DWI-positivity on stroke or death after adjusting for other putative predictors.

Results: A total of 993 patients with TIAs were identified over the study period, of which 582 received an MRI. Of these patients, 146 (25%) were DWI-positive. After adjustment for clinical risk factors, DWI-positivity was associated with an increased three-year risk of stroke or death (HR 1.46, 95% CI: 1.04-2.06 p=0.04).

Conclusions: Our data suggest that DWI positivity after a TIA is independently associated with an increased risk of stroke or death at three years.

Table 1. Predictors of three-year risk of subsequent ischemic stroke or death following index TIA.

Patient Characteristics	HR (95% CI)	p-value
DWI-Positive TIA	1.46 (1.03-2.06)	0.04
Age (per 10 years)	1.56 (1.35-1.82)	<0.01
Male	1.55 (1.12-2.14)	0.01
Black	1.37 (0.86-2.18)	0.18
Diabetes mellitus	1.43 (1.03-2.00)	0.03
Atrial fibrillation	1.66 (1.14-2.42)	0.01
Coronary heart disease	1.89 (1.30-2.74)	<0.01
Current smoker	1.97 (1.25-3.09)	<0.01
Initial NIHSS (per point)	1.07 (1.00-1.14)	0.05
Systolic Blood Pressure (at presentation)	0.99 (0.99-1.00)	0.08

Abbreviations: HR = Hazard ratio, DWI = Diffusion-weighted imaging, TIA = Transient ischemic attack, NIHSS = National Institute of Health Stroke Scale.

Disclosure of interest: No

1474

Safety and efficacy of tenecteplase versus alteplase in acute stroke patients with carotid tandem lesions: results from the AcT trial

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Background and aims: Carotid tandem lesions (⩾70% stenosis or occlusion) account for 15-20% of acute stroke with large vessel occlusion. We investigated the safety and efficacy of intravenous tenecteplase (0.25mg/kg) versus intravenous alteplase (0.9mg/kg) in this subgroup.

Methods: This is a post-hoc analysis from the Alteplase compared to Tenecteplase (AcT) trial. Patients with ⩾70% stenosis of the extracranial internal carotid artery (ICA) and concomitant intracranial occlusions on baseline CT-Angiography were included. Primary outcome was the proportion of 90-day-modified Rankin Scale (mRS) 0-1 (excellent outcome). Secondary outcomes were mRS 0-2, mortality, and symptomatic ICH. Angiographic outcomes were rAOL2b-3 at first and eTICI 2b-3 on final angiography. Univariable and multivariable mixed-effects logistic regression were carried out.

Results: Among 682 patients with intracranial occlusions, 128 (18.8%) had carotid tandem lesions. Of these, 93/128 (72.7%) underwent intravenous thrombolysis plus endovascular therapy (IVT+EVT) while 35/128 (27.3%) were treated with IVT alone. In the IVT+EVT group, tenecteplase was associated with higher odds of 90-day-mRS 0-1 (46.0% versus 32.6%, adjusted OR [aOR]=3.21; 95% CI=1.06-9.71) compared to alteplase. No statistically significant differences in rates of mRS 0-2 (54.0% versus 58.1%), initial rAOL 2b-3 (16.3% versus 28.6%), final eTICI 2b-3 (83.7% versus 85.7%), and mortality (18.0% versus 16.3%) were found. SICH only occurred in one patient, treated with tenecteplase. There were no differences in treatment outcomes in the IVT-only group ($p>0.05$).

Conclusions: In patients with carotid tandem lesions treated with EVT, intravenous tenecteplase is associated with similar clinical, safety and angiographic outcomes, as compared to alteplase.

Disclosure of interest: No

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Impact of Vessel Tortuosity and Thrombus Characteristics on First-Pass Effect and Procedural Outcomes in Acute Ischemic Stroke Treated with Endovascular Therapy

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Background and aims: Despite improvements in device technology, only one-third of stroke patients undergoing endovascular therapy achieve first-pass effect (FPE). We investigated the relationship of arterial tortuosity and radiological thrombus characteristics with FPE and procedure times.

Methods: Patients with thin-slice baseline non-contrast CT and CT-angiography from the ESCAPE-NA1 trial were included. CTA was used to extract the centerline on affected side and calculate tortuosity indices for extracranial and intracranial vasculature. Tortuosity was estimated with the tortuosity index. As for thrombus characteristics, we included length and non-contrast attenuation. Primary outcome was FPE (eTICI score 2c/3 after one pass). Secondary outcomes were final reperfusion grade and procedure times. Associations of tortuosity and thrombus characteristics with outcomes were assessed using unadjusted and adjusted regression models.

Results: In total, 534 patients were included. FPE was observed in 168 patients (31.7%). Older age (adjusted odds ratio [aOR] 1.02, 95%CI 1.01-1.04), shorter thrombi (aOR 0.98 [95%CI 0.96-0.99]), and lower intracranial tortuosity (aOR 0.95 [95%CI 0.91-0.99) were independently associated with increased odds of FPE. Higher extracranial tortuosity was associated with prolonged intracranial access, reperfusion and procedural times but not with final reperfusion. Extracranial tortuosity had a significant effect on FPE only in the contact aspiration group (aOR=0.90 [95%CI 0.84-0.98]) compared with stent-retrievers alone and combined first-line approach.

Conclusions: In patients with large vessel occlusion stroke undergoing thrombectomy, thrombus length and intracranial tortuosity were independently associated with FPE. Increased extracranial tortuosity was linked to prolonged procedure times.

Disclosure of interest: No

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UP-TRENDING CARDIAC TROPONIN PATTERN: A PROGNOSTIC BIOMARKER FOR CARDIAC COMPLICATIONS AND MORTALITY AFTER ACUTE ISCHEMIC STROKE

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Background and aims: Dynamic cardiac troponin (cTn) is a risk factor for in-hospital mortality in acute ischemic stroke (AIS) patients. However, characterization of post-stroke cardiac events and clinical outcomes have not been fully assessed.

Methods: We retrospectively screened consecutive AIS patients admitted to 5 stroke centers from June 2020 to July 2022. Inclusion criteria were: increased cTn at admission and at least one additional cTn measurement within 48 hours. Exclusion criteria were: in-hospital AIS, concomitant illnesses affecting cTn, positive drug test. cTn patterns were defined as: up-trending>20% cTn increase from baseline, lateralized ⩽20% change in either direction, down-trending>20% decrease from baseline.

Results: Of 3,789 AIS patients screened, 300 were included. Sixty-eight (23%) had up-trending pattern, 162 lateralized (54%), and 70 (23%) had down-trending pattern. The relationship between cTn patterns and outcomes of interest are shown in Table. In multivariable analyses, an up-trending pattern was associated with higher risk of post-stroke in-hospital cardiac events (OR=3.2 [95%CI:1.6-6.5] vs OR=0.6 [CI:0.3-1.1] for lateralized compared to down-trending as reference), 7-day mortality (OR=8.8 [CI:1.9-40.5] vs OR=1.3 [CI 0.2-6.6]), and worse discharge disposition (OR=3.5 [CI 1.7-7.1] vs OR=1.3 [CI 0.7-62.5]).

Conclusions: In AIS patients, an up-trending cTn pattern is associated with increased risk of in-hospital cardiac events and mortality, highlighting the need for tailored monitoring strategies for AIS patients. Serial cTn measurements, rather than a single baseline value, may be valuable in all AIS patients to allow for risk stratification, and timely identification, and treatment of cardiac complications.

Table. Clinical outcomes.

	Down-trending (n=70)	Lateralized (n=162)	Up-trending (n=68)	*P* value
Cardiac Outcomes				
STEMI/nSTEMI	16%	11%	43%	**<0.01**
EKG changes	31%	11%	40%	**<0.01**
Arrhythmia	13%	12%	31%	**<0.01**
Echocardiogram changes	24%	19%	23%	0.67
Takotsubo syndrome	1%	1%	6%	**0.03**
Any cardiac injury	43%	30%	70%	**<0.01**
Length of hospital stay	5 (4-10)	5 (3-8)	6 (4-11)	0.16
Inability to ambulate	19%	15%	24%	0.28
Mortality within 7 days*	3%	4%	21%	**<0.01**
Worse discharge disposition	26%	31%	54%	**<0.01**

Categorical variables are presented as frequency (column percent), continuous variables are presented as mean ± standard deviation (SD), or median and interquartile range (IQR) when non-normally distributed.
STEMI/nSTEMI: ST-Elevation Myocardial Infarction/non ST-Elevation Myocardial Infarction, EKG: electrocardiogram.
Inability to ambulate defined as inability to walk independently with or without assistance.
Worse discharge disposition defined as discharge to long-term facility, hospice, in-hospital death.
* P values were calculated using Fisher exact text.

Disclosure of interest: No

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Low rates of return to baseline function despite complete reperfusion after mechanical thrombectomy (CR-MT): NCCT mCTA analysis from AcT trial

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Background and aims: Complete reperfusion after mechanical thrombectomy (CR-MT) is associated with good outcome, regardless of age. Alteplase compared to Tenecteplase (AcT) trial collected the novel outcome of "return to baseline function," an optimal outcome for elderly individuals with significant premorbid impairments. We evaluated the relation between this outcome and CR-MT by estimating ischemic core using a pragmatic approach combining NCCT-ASPECTS and multiphase CT-Angiography collateral extent (mCTA-ce) scoring.

Methods: Participants from AcT trial with anterior circulation stroke who had mCTA and underwent MT were categorized by age (<65, 65-74, ⩾75 years). 10-point mCTA-ce in the M2-6 ASPECT regions were evaluated as 0 (poor), 1 (moderate), or 2 (normal), and combined with ASPECTS score for a 20-point ASPECTS+mCTA-ce score. We investigated the association between combined score and 90-day outcome with mixed effects logistic regression adjusting for sex and stroke severity.

Results: Of 378 patients (103, 116, and 159 in age <65, 65-74, and ⩾75 years), ASPECTS, mCTA-ce, and combined score were median (IQR) 8(7-10), 9(8-10), and 17(16-19). Amongst patients with CR-MT, a combined score >10, regardless of age, was required for >20% chance of return to baseline function (Figure A). Still, functional independence (mRS ⩽2) was associated with younger age [<65y: aOR 6.8 (95%CI 2.7-16.8); 65-75y: aOR 2.1 (1.1-4.3) adjusted for combined score, compared to >75y] (Figure B).

Conclusions: CR-MT when low ASPECTS+mCTA-ce score was associated with low rate of return to baseline function irrespective of age; but functional independence was more commonly seen in young patients.

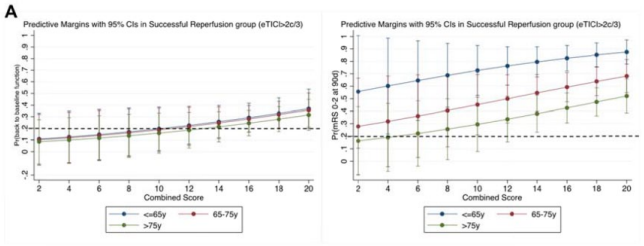

Figure. Associations between the combined score and back to baseline function (A), mRS ≤2 (B) in the overall population by age categories. Dotted line shows 20% probability of each outcome.

Disclosure of interest: No

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ADDRESSING VASCULAR RISK FACTORS AFTER STROKE – A POPULATION-BASED STUDY

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Background and aims: Current guidelines recommend interventions for management of blood pressure (BP), HbA1c, lipid levels, and antiplatelet/anticoagulation therapy in patients with ischemic stroke or transient ischemic attack (TIA), to reduce stroke recurrence risk. We aim to analyze the compliance with ESO recommendations among stroke survivors in the Catalan population.

Methods: Ischemic stroke and TIA patients were identified from a prospectively-collected public healthcare-based dataset of patients admitted in 88 hospitals in Catalonia over 6 years. Records were reviewed for 6 months after the stroke, including mean SBP/DBP, HbA1c, LDL-cholesterol levels, smoking and drinking habits, and antithrombotic/anticoagulation prescription rates.

Results: We included 39494 patients, 54% were male, median age was 77(67-87). Mean SBP was 133(SD±15), mean DBP 75(±9)mmHg; 34% patients met SBP objective of <130mmHg, despite 76% of patients were prescribed BP-lowering therapy. A 37% had a history of diabetes mellitus, and 33% were prescribed antidiabetic treatment. Mean HbA1c was 6.03%(±1.43); 79% patients reached <53mmol/mol (7%) objective. Mean LDL-cholesterol was 100.3 (±37.4), only about 66% of patients were prescribed statins; 20.6% patients met LDLc < 70mg/dl recommendation.

Smoking and drinking habits were more frequent among males: 60.4% smoked and 19.7% reported regular alcohol consumption, as compared with 14.5% and 2.7% of females, respectively.

Among patients with atrial fibrillation, 63% were prescribed anticoagulation therapy. Antiplatelets prescription rates were 54% in the whole cohort and 64% in patients without atrial fibrillation.

Conclusions: At 6-months after an ischemic stroke, a high proportion of patients did not meet ESO recommendations for secondary stroke prevention.

Disclosure of interest: No

943

Management and Outcomes of Patients with Acute Ischemic Stroke and Atrial Fibrillation in the Era of NOAC

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Background and aims: The use of Non-vitamin K antagonist oral anticoagulant (NOAC) is a cornerstone for stroke prevention in patients with atrial fibrillation (AF). The study aimed to describe real-world antithrombotic use and outcomes in patients with acute ischemic stroke (AIS) and AF in the NOAC era.

Methods: AIS patients with AF hospitalized at 15 centers between 2018 and 2021 were enrolled in this study. Information on prescribed antithrombotics and occurrences of vascular events, bleedings and deaths were prospectively collected for a maximum of three years. The cumulative incidence at each time point was estimated for the primary outcome, which was a composite of recurrent stroke, myocardial infarction, and death, and bleeding events. The incidence rate was also calculated according to each time interval.

Results: 2,965 patients (mean age 75, 54% men) were enrolled and followed for a median of 1.9 years. One-third of patients were given NOACs upon admission, increasing to 80% at discharge and remaining over 70% for 3 years. The 3-year cumulative incidence of the primary outcome and bleeding were 40.7% and 10.7%. The incidence rate of the primary outcome and bleeding event was highest in the first 3 months (95.1 and 19.7 per 100 person-year, respectively) and decreased markedly thereafter.

Conclusions: This multicenter study shows good adherence to NOAC therapy in real-world practice, but a high risk of major vascular events and bleeding, particularly during the early months after stroke in patients with AIS and AF.

Table. Incidence of primary outcome and bleeding events according to time points

	Incidence rate[a] (per 100 person-years) [95% CI]			Cumulative incidence[b] [95% CI]	
	Primary outcome[c]	Bleeding events		Primary outcome[c]	Bleeding events
Total	23.66 (22.24, 25.18)	5.05 (4.44, 5.75)			
0-3 month	95.08 (87.66, 103.13)	19.65 (16.56, 23.32)	3-month	19.63 (18.24, 21.10)	4.55 (3.85, 5.38)
3 month – 1 year	9.73 (8.53, 11.11)	2.19 (1.68, 2.86)	1-year	27.15 (25.58, 28.79)	6.67 (5.80, 7.66)
2nd year	3.96 (3.33, 4.71)	0.83 (0.57, 1.19)	2-year	33.60 (31.82, 35.44)	8.50 (7.44, 9.70)
3rd year	2.26 (1.74, 2.93)	0.52 (0.31, 0.88)	3-year	40.68 (38.32, 43.12)	10.68 (9.20, 12.39)

[a]Incidence rate: number of subjects with the composite events divided by the total of the lengths of time that each subject in the population was at risk, expressed as person-time
[b]Cumulative incidence: cumulative probability of the event calculated using Kaplan-Meier estimates
[c]Composite of recurrent stroke, myocardial infarction, and death
CI, confidence interval

Disclosure of interest: Yes

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Cognitive recovery in the first year after first-ever ischemic stroke in young adults: The ODYSSEY study

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Background and aims: Data on cognitive recovery in young stroke patients is limited. We aimed to investigate the presence of cognitive impairment and the longitudinal course of cognitive performance the first year after young stroke.

Methods: In this multicenter prospective cohort study, we recruited patients with first-ever ischemic stroke, aged 18 to 49 years, between 2013 and 2021. Cognitive assessment was assessed up to 6 months and after 1 year after index event. We calculated composite Z-scores for 7 cognitive domains using age, education and/or sex-adjusted normative mean or control data. We defined cognitive impairment as a composite Z-score $<$-1.5. We used the reliable change index (RCI) to determine whether there was cognitive recovery (RCI$>$1.96) or decline (RCI$<$-1.96).

Results: 393 patients (median age 44.3 (SD7.6), 49.6% women) completed cognitive assessments with median time between the assessments of 403.0 (SD89.3) days. We observed equal proportion of patients with cognitive recovery and decline for each domain based on the RCI. Overall there was no cognitive change in most patients, based on the total RCI. Most patients who recovered were cognitive impaired at baseline. In those patients recovery was observed in 25/108 (23.1%) in processing speed, 51/129 (39.5%) in visuoconstruction and 5/26 (19.2%) in executive functioning.

Conclusions: Comparable recovery and decline rates were found for the tested cognitive domains. However, there was no overall cognitive change in most patients after adjusting for repeated assessments. Most patients who recovered were cognitive impaired at baseline and they recovered in processing speed, visuoconstruction and executive functioning.

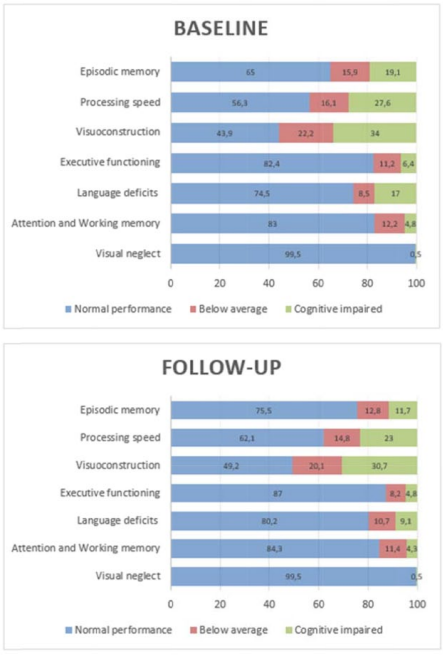

Figure 1 Below average performance and cognitive impairment at baseline and follow-up
The proportion of patients (%) with young stroke with below average performance (composite Z-score between −1.5 and −1.0) or a cognitive impairment (composite Z-score <-1.5) at baseline and follow-up

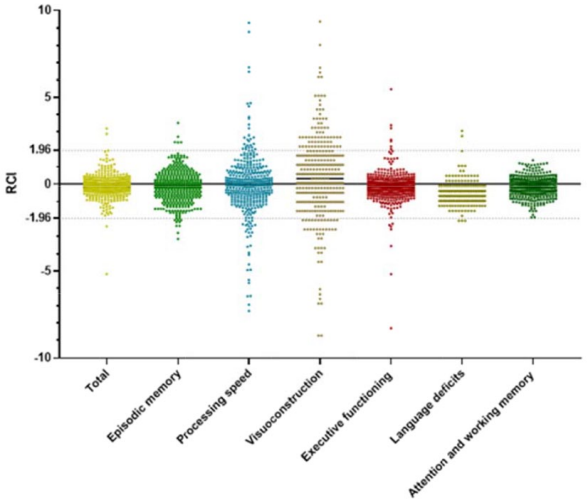

Figure 2 Reliable Change Index overall and per cognitive domain
Reliable Change Index (RCI) for each patient overall and per cognitive domain. RCI >1.96 indicates cognitive recovery, RCI <-1.96 indicates cognitive decline.

Disclosure of interest: No

1378

PRE-STROKE FRAILTY AND MORTALITY: THE SOUTH LONDON STROKE REGISTER

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Background and aims: Frailty is common in older adults and pre-stroke may be associated with poorer outcomes following a stroke event. We aim to derive a clinically relevant stroke frailty index and assess relationships with all-cause mortality in a large population-based registry.
Methods: Data were from 6546 (mean age 69.4 years; 49% female; 26% black) first ever stroke patients recruited into the South London Stroke Register, an ongoing multi-ethnic urban stroke registry, between 1995-2019 and followed up for up to 24 years. A 20-item deficit accumulation frailty index was derived from assessment of pre-stroke chronic conditions and functional ability according to standard methods. Relationships between pre-stroke frailty and mortality were modelled using Cox Proportional Hazard Models adjusted for demographic variables and case mix.
Results: 158 (2.4%) participants were frail and 1651 (25%) were pre-frail. The prevalence of frailty increased with age and was higher in female participants (3.4% female vs 1.5% male). Frail participants were more likely to experience severe strokes (17% in frail vs 5.6% in robust) A total of 4140 participants died during follow-up. After adjustment for age, sex, ethnicity, and stroke type and severity, higher pre-stroke frailty was associated with higher mortality (HR 1.42; 95% CI 1.41-1.42 for prefrail and HR 2.09; 95% CI 1.65-2.67 for frail compared to robust participants).
Conclusions: Pre-stroke frailty was associated with higher risk of all-cause mortality in this large population-based registry. Assessment of pre-stroke frailty may help to improve acute stroke care, secondary prevention planning, as well as, patient prognostication.
Disclosure of interest: No

1536

RELATION OF SYSTOLIC BLOOD PRESSURE CONTROL AND BLOOD PRESSURE VARIABILITY WITH COGNITIVE DECLINE: A NATIONALLY REPRESENTATIVE POPULATION-BASED 8-YEAR COHORT STUDY

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Background and aims: Limited data exist on the effects of blood pressure variability (BPV) on cognitive decline in populations of low- and middle-income countries. We determines associations of systolic blood pressure (SBP) control and BPV on cognition performance in a nationally representative population-based cohort study.
Methods: The China Health and Retirement Longitudinal Study included 5,696 participants (age ⩾45 years) in four waves during 2011-2018. BPV was measured using within-individual standard deviation (SD) of SBP (in three waves visits) and coefficient of variation (CV). Global cognition score was the summation of scores from orientation, calculation, and picture redrawing abilities; higher scores indicate better cognitive function. Multivariable linear regression models were used to examine associations of SBP control and BPV, and cognition performance and cognition decline.
Results: Of 5,696 participants (mean age 57.7 years, 47.4% female), 27.8% showed cognitive decline over 8-years of follow-up. SD of BPV significantly reduced the odds of good cognitive function (coefficient -0.140 [95%CI -0.222 to -0.058]). Similar findings were found for CV of BPV. Compared to having good SBP control, those with poor SBP control

were more likely to show low global cognition scores (coefficient-0.519 [95%CI -0.997 to -0.041). Subgroup analysis showed significant associations in those without hypertension at baseline, not on antihypertensive medication, and rural residents, but no significant relations with seen in people with hypertension, medication use, or urban residents.
Conclusions: In middle-aged and older Chinese adults, uncontrolled SBP and higher BPV are independent predictors of accelerated cognitive decline.
Disclosure of interest: No

1544

EFFECTS OF MULTIMORBIDITY ON OUTCOME IN THROMBOLYSED PATIENTS WITH ACUTE ISCHAEMIC STROKE: POST HOC ANALYSIS OF ENCHANTED (ENHANCED CONTROL OF HYPERTENSION AND THROMBOLYSIS STROKE STUDY)

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Background and aims: Multimorbidity (MM) is increasingly common and predicts adverse outcomes, but its influence on recovery from acute ischaemic stroke (AIS) has not been quantified. We determined associations of MM on functional recovery in the Enhanced Control of Hypertension and Thrombolysis Stroke Study (ENCHANTED)
Methods: ENCHANTED was an international, multicentre, 2x2 factorial, open, blinded endpoint, randomised controlled trial where no difference in functional recovery was found between intensive (target <140mmHg) versus standard (<180mmHg) SBP management in thrombolysis-treated AIS patients. The association of MM (⩾2 coexisting chronic diseases) on death and death or major disability (mRS scores 3–6) at 90 days were assessed in logistic regression models.
Results: In 2179 alteplase-eligible AIS patients (mean age 67 years, 38% female), compared to those without other chronic disease, those with MM had higher odds of death (adjusted odds ratio [aOR] 2.44, 95%CI 1.39-4.27). There were also significant associations of single disease with death or major disability (aOR 1.46, 95%CI 1.07-1.99) and of MM with death or major disability (aOR 1.57, 95%CI 1.16-2.12). However, there was no significant association between single disease and death. Subgroup analysis revealed a higher effect of MM on death in female patients and young-elderly (age <80 years) than males and senior elderly patients.
Conclusions: Individuals with MM have higher odds of death and major disability in thrombolysed AIS patients. The effect of MM on death is higher in females and younger patients than males and senior elderly patients.
Disclosure of interest: No

1638

Clinical trajectories and outcomes of first-ever ischemic strokes in persons living with HIV: A retrospective study from multicenter stroke units

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Background and aims: Over the past 2 decades, the stroke risk doubled for persons living with human immunodeficiency virus (PLHIVs) compared to the uninfected population. Stroke Unit (SUs) access, acute reperfusion therapies use and outcomes for PLHIVs admitted for acute ischemic stroke (AIS) are scarce.
Methods: AIS patients admitted (01/01/2017–31/01/2021) to 10 representative Paris-area SUs were screened retrospectively from the National Hospitalization Database. PLHIVs were compared to age-, initial NIHSS- and sex-matched HIV-uninfected controls (HUCs). Outcome was the 90-day modified Rankin Scale score.
Results: 126 PLHIVs with confirmed first AIS were included. Despite antiretrovirals, uncontrolled plasma HIV loads (pIVL) exceeded > 50 copies/ml (26% of all PLHIVs, 38% of those ⩽55 years old). MRI revealed unknown AIS in 1/3 PLHIVs, twice the HUC rate ($p = 0.006$). Modifiable vascular risk factors (VRFs) were not optimally controlled in both groups: 20–30% had no specific hypertension, diabetes and/or dyslipidemia treatments. Decreasing stroke-cause frequencies were: large artery atherosclerosis (LAA), undetermined, other cause, cerebral small vessel diseases (CSVD) and cardioembolism. PLHIVs' and HUCs' stroke outcomes were comparable. Multivariable analyses retained good PLHIV prognosis solely associated initial NIHSS or reperfusion therapy. CSVD/LAA were associated with older age and hypertension for all PLHIVs.
Conclusions: The high uncontrolled HIV-infection rate and suboptimal VRF treatment, potentially attributable to loosening of PLHIVs' biannual follow-up, support heightened vigilance to counter suboptimal HIV suppression and antiretroviral adherence, and improve effectiveness of preventive VRF therapy mainly for younger PLHIVs. Those easy and inexpensive measures could reduce PLHIVs' AIS risk.

Table 1. Demographic, epidemiological, clinical and biological characteristics of PLHIVs and HUCs and their ischemic strokes.

Characteristic	PLHIVs (n = 126)	HUCs (n = 128)	p Value[a]	PLHIVs ≤55 years (n = 62)	PLHIVs >55 years (n = 64)	p Value[a]
Subjects						
Demographic						
Age, years	55 [47–64]	55 [48–63]	0.9			
≤55 years	49%	52%	0.7			
Males	76%	76%	0.9	69%	83%	0.08
HIV infection						
Estimated HIV duration, years	15 [9–22]			13 [6–21]	18 [11–23]	0.1
Current CD4+ cells/µl	501 [296–778]			446 [222–753]	529 [300–788]	0.4
CD4+ nadir, cells/µl	143 [60–378]			109 [39–217]	244 [83–439]	0.1
HIV pIVL	<50 [<50–239]			<50 [<50–665]	<50 [<50–500]	**0.04**
Current undetectable pIVL	73%			62%	85%	**0.01**
CD4/CD8 ratio	0.60 [0.3–1.0]			0.6 [0.2–1.1]	0.4 [0.3–0.8]	0.7
Previous neurological events	12%			20%	6%	0.06
Cardiovascular risk factors						
Hypertension	49%	48%	0.9	38%	61%	**0.01**
Current antihypertensive use	82%	75%	0.4	88%	78%	0.5
Diabetes	18%	16%	0.7	11%	24%	0.07
Current antidiabetic use	70%	90%	0.1	71%	69%	>0.9
Dyslipidemia	34%	29%	0.3	24%	43%	**0.03**
Current lipid-lowering–drug use	81%	76%	0.5	69%	90%	0.1
Body mass index, kg/m²	24 [22–29]	26 [23–29]	0.4	24 [22–29]	25 [22–29]	0.7
≥30	19%	20%	0.9	20%	19%	>0.9
Addiction (mainly cannabis)	16%	14%	0.7	23%	15%	0.6
Current smoker	36%	46%	0.1	36%	6%	>0.9
Alcoholism	26%	24%	0.8	27%	24%	0.9
Sleep-apnea syndrome	5%	11%	0.4	11%	0%	0.3
≥2 CVRF	71 (56)	78 (61)	0.5			0.1
≥3 CVRF	35 (28)	44 (34)	0.3			

Values are median [interquartile range] or number (%).

[a] Significantly different p values are in bold type.

Abbreviations: CVRF, cardiovascular risk factor; HIV, human immunodeficiency virus; HUCs, HIV-uninfected controls; PLHIVs, persons living with HIV; pIVL = plasma HIV load;

Table 2. Characteristics of PLHIVs' and HUC's first-ever ischemic strokes.

Characteristic	PLHIVs (n = 126)	HUCs (n = 128)	p Value*	PLHIVs ≤55 years (n = 62)	PLHIVs >55 years (n = 64)	p Value*
Type			0.8			>0.9
Wake-up stroke	24%	24%	>0.9	22%	24%	0.9
Previous stroke on MRI	33%	18%	**0.006**	31%	36%	0.9
CSVD on MRI	41%	31%	**0.1**			
Ischemic stroke etiologies						
Large artery atherosclerosis	34%	34%	>0.9	22%	41%	**0.04**
Cardioembolism	12%	16%	0.4	11%	12%	>0.9
CSVD	13%	5%	0.07	**8%**	**25%**	**0.01**
Undetermined	24%	28%	0.4	19%	21%	0.4
Others	17%	16%	0.8	30%	3%	**<0.001**
Initial NIHSS						
Whole population	3 [1–6]	2 [1–5]	0.1	3 [1–6]	4 [1–7]	0.6
≤5	71%	79%				
6–10	17%	10%				
11–15	6%	4%				
Admission-to-home interval, days	8 [4–15]	5 [3–11]	**0.02**	10 [4–16]	7 [4–14]	0.2
Prognosis at 3 months						
mRS score < 2	66%	77%	0.06	65%	65%	>0.9
mRS score ≤ 2	80%	87%	0.1	65%	65%	>0.9

Values are median [interquartile range] or number (%).

*Significantly different values are in bold type.

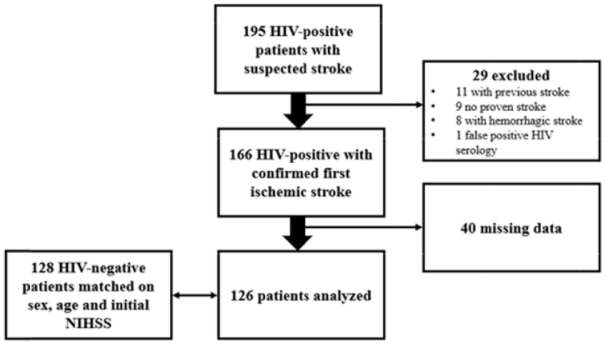
Abbreviations: CSVD, cerebral small vessel disease; HUCs, HIV-uninfected controls; NIHSS, National Institutes of Health Stroke Score; MRI, magnetic resonance imaging; mRS, modified Rankin Scale; PLHIVs, persons living with HIV.

Table 3. Associations between good prognosis and HIV status or etiology

Adjusted covariates	n	Good prognosis (yes/no) OR	95% CI	p
Logistic regression	240			
HIV status		0.44	0.17–1.07	0.08
Age		0.97	0.93–1.01	0.1
Male sex		1.05	0.34–3.03	0.9
Initial NIHSS		0.73	0.65–0.80	**<0.001**
Acute reperfusion therapy [yes]		17.55	3.37–136.50	**0.002**
Stroke-to-admission interval (days)		1.00	0.99–1.01	0.5
Firth logistic regression	202			
Etiology [CSVD/LAA]		0.99	0.37–2.62	>0.9
Age		0.95	0.91–1.00	**0.04**
Male sex		1.18	0.36–3.86	0.8
Initial NIHSS		0.74	0.66–0.82	**<0.001**
Acute reperfusion therapy [yes]		10.54	1.71–64.84	**0.01**
Stroke-to-admission interval (days)		1.00	0.99–1.01	>0.9

CSVD, cerebral small vessel disease; HIV, human immunodeficiency virus; LAA, large artery atherosclerosis; NIHSS, National Institutes of Health Stroke Score.

Figure 1: Study flow-chart. HIV, human immunodeficiency virus; NIHSS, National Institutes of Health Stroke Score.



Disclosure of interest: No

REHABILITATION AND RECOVERY

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Expected health benefits of information from www.strokengine.ca, a knowledge translation stroke rehabilitation website: A web-based survey

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Background and aims: Stroke Engine is an evidence-based knowledge translation resource with over 10 000 visitors/week. With the overall aim to improve its content, we documented perceived 1) Situational relevance, 2) Cognitive impact 3) Intention-to-use and 4) Expected patient/health benefits from Stroke Engine users on information consulted.

Methods: A web-based survey anchored in the Information Assessment Method (IAM) was posted as an invitation tab to assess the value of information. Sociodemographic characteristics were also collected and a space for free text comments was provided. Descriptive statistics were used and thematic analysis for free text comments.

Results: Sample consisted of 6634 respondents. Health professionals (n=3663) and students (n=2784) represented 97.2% of total responses. The other 2.8% of responses were from individuals having sustained a stroke (n=87) and their relatives (n=100). 1) Situational relevance: Assessments (including selecting, obtaining and interpreting results from a test) was the main topic searched by health professionals (54.6%) and students (50.4%) whereas general information on stroke rehabilitation was the number one topic for nearly two-thirds of individuals with stroke (59.2%) and their relatives (62.6%). 2) Cognitive impact was characterized by learning something new. 3) Intention-to-use was high (>70%) among respondents. 4) Expected patient/health benefits such as improvement in health and well-being was the top ranked category for all four subgroups.

Conclusions: Valuable feedback on Stroke Engine was obtained including its potential implementation of its evidence-based content in clinical practice and perceived expected impact for patients and their health professionals.

Disclosure of interest: No

698

Individual patient data meta-analysis of three large trials of fluoxetine for stroke recovery; for the FOCUS, AFFINITY and EFFECTS collaborations

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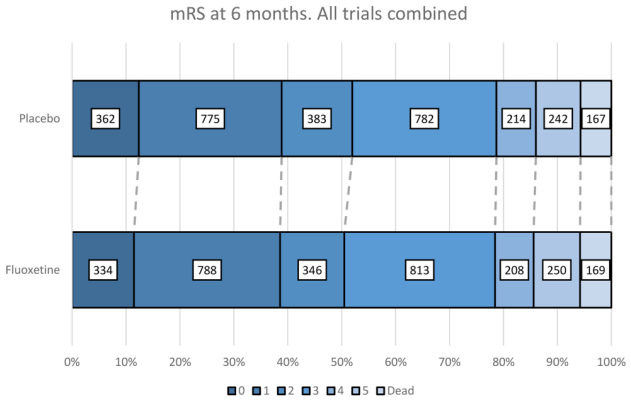
Background and aims: Three large randomized trials of fluoxetine for stroke recovery (FOCUS (fluoxetine or control under supervision), AFFINITY (the Assessment oF FluoxetINe In sTroke recovery) and EFFECTS (Efficacy oF Fluoxetine-a randomisEd Controlled Trial in Stroke)) were collaboratively designed (same core protocol) to facilitate an individual patient data meta-analysis.
Methods: The FOCUS statistician securely combined the data from FOCUS, AFFINITY and EFFECTS and performed a fixed effects meta-analyses, for the primary outcome (modified Rankin scale (mRS) at 6 months) and the same secondary outcome domains as for the individual trials. Here we report the primary outcome
Results: 5907 people (mean age 69.6 years (SD 12.3), 2256 (38.19%) females), were recruited (2-15 days post-stroke) from five countries (Australia (n=532, 9.01%), New Zealand (n=42, 0.71%), UK (n=3127, 52.94%), Sweden (n=1500, 25.39%) and Vietnam (n=706, 11.95%); then randomized to fluoxetine 20mg daily or matching placebo for 6 months. 5833 (98.75%) were available at 6 months. An ordinal comparison of mRS at 6 months, adjusted for the minimization variables (baseline probability of being alive and independent at 6 months, time to treatment, motor deficit or aphasia), was similar in the two groups (common OR 0.959, 95% CI 0.875 to 1.052, p=0.373) where a common OR in favour of placebo is <1.0 (figure). There were no statistically significant interactions between the minimization variables) and pre-specified subgroups (age, pathological type, inability to assess mood, proxy or patient consent, baseline depression and country).
Conclusions: Fluoxetine 20mg daily for six months does not improve functional recovery post- stroke.



Disclosure of interest: No

840

Intranasal administration of human CD34+ cells significantly reduces stroke-induced behavioural impairments

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Background and aims: We have shown that intramyocardial delivery of CD34+ cells in post-acute myocardial infarction patients is safe and leads to long term improvement. Even patients who were initially recommended for a heart transplant, no longer required it several years after the cell injection. Expanded human CD34+ cells (ProtheraCytes®) promote regeneration and revascularization of the damaged myocardial tissue through the secretion of paracrine growth factors and exosomes containing pro-angiogenic and anti-apoptotic miRNAs. The aim of this study was to investigate if ProtheraCytes® have the same regenerative properties in an ischemic stroke model.
Methods: We administered ProtheraCytes® in a stroke model of transient middle cerebral artery occlusion (MCAO) in Sprague-Dawley rats via three different routes of administration: intra-arterial, intracerebral, and intranasal. Motor and neurological impairments were evaluated at baseline and at day 1, 7, 14, and 28 post-cell administration via the elevated body swing test and Bederson neurological test. Post-mortem, histological analysis evaluated the infarct area and peri-infarct area cell survival.
Results: ProtheraCytes® administered through all three routes of administration significantly improved behavioral recovery compared to placebo control groups, and in some cases, returned to baseline levels before the ischemic lesion. Animals receiving ProtheraCytes® also had significant reduction in infarct damage and cell loss in the peri-infarct area for all delivery routes.
Conclusions: These are very encouraging results for the development of this therapy as the intranasal route of administration can be easily implemented in the clinic with minimum risk to the patient.
Disclosure of interest: Yes

1590

Early robot-assisted proprioceptive training FOR arm reaching in acute stroke

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Background and aims: Impairments of proprioception may limit motor recovery after stroke. We have shown that a single session of robot-assisted proprioceptive perceptual training facilitates motor learning and improves arm reaching in chronic stroke. Here, we apply this training to acute patients early after stroke.
Methods: Twenty-one subjects with acute first ischemic stroke (median 8.5 days) causing motor and somatosensory deficits >2 in NIHSS upper extremity item, were recruited from the stroke unit of the Jewish General Hospital, Montreal. Subjects were randomized 2:1 to either receive 5 days of 45 min robot-assisted proprioceptive training with feedback (intervention) or without (control). Subjects judged whether their arm was moved by the robot (Force Dimension Delta) along a straight trajectory either to the left or right of body midline. Fugl-Meyer upper extremity scores and arm reaching accuracy parameters were assessed at baseline and follow-up at 1 and 90 days after last treatment.
Results: Compared to the controls, classification error and all reaching accuracy parameters from baseline to first and 90 day follow-up were lower in the intervention group (Table). The training had no effect on the Fugl-Meyer score.
Conclusions: Providing robot-assisted proprioceptive training early in an acute stroke unit setting is feasible and could improve proprioception and reaching accuracy after only 5 consecutive sessions.
Funding: Heart and Stroke Foundation of Canada Grant-in-Aid (G-16-0001466)

Table.

	Intervention		Control	
Day post-treatment	1	90	1	90
Classification error	85%		105%	
Corrective movements	76%	52%	89%	60%
Duration	77%	56%	83%	68%
Target error	71%	50%	81%	71%

Disclosure of interest: No

1712

BIOMARKERS TO IMPROVE PREDICTION OF FUNCTIONAL OUTCOME AFTER STROKE. RESULTS OF THE SICFAIL, STRAWINSKI, AND PREDICT STUDIES

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Background and aims: Acute ischemic stroke (AIS) outcome prognostication remains challenging despite established prognostic scores. We investigated whether a panel of biomarkers improves the predictive properties of existing scores.

Methods: We investigated the improvement in discrimination, calibration, and overall performance of the Acute Stroke Registry and Analysis of Lausanne (ASTRAL) and age/NIHSS scores provided by procalcitonin, copeptin, cortisol, mid-regional pro-atrial natriuretic peptide (MR-proANP), and N-terminal pro-B-type natriuretic peptide (NT-proBNP) using data from two prospective cohorts (SICFAIL, PREDICT) and one clinical trial (STRAWINSKI). Poor outcome was defined as modified Rankin Scale >2 at 12 (SICFAIL, derivation dataset) or 3 months (PREDICT/STRAWINSKI, pooled external validation dataset).

Results: Among 412 SICFAIL participants (median age 70 years, quartiles 59-78; 63% male; median NIHSS 3, quartiles 1-5), 29% had a poor outcome. Area under the curve of the ASTRAL and age/NIHSS scores were 0.76 (95%CI 0.71-0.81) and 0.77 (95%CI 0.73-0.82), respectively. Copeptin (0.79, 95%CI 0.74-0.84), NT-proBNP (0.80, 95%CI 0.76-0.84), and MR-proANP (0.79, 95%CI 0.75-0.84) significantly improved ASTRAL score's discrimination, calibration, and overall performance. Copeptin improved age/NIHSS model's discrimination, copeptin, MR-proANP, and NT-proBNP improved calibration and overall performance. Biomarkers did not improve discrimination in the validation dataset (450 patients, median age 73 years, quartiles 66-81; 54% male; median NIHSS 8, quartiles 3-14), despite improvements in calibration and model performance

Conclusions: Copeptin, NT-proBNP, and MR-proANP yielded a consistent yet modest improvement in the predictive properties of existing prognostic scores in patients with mild AIS. Their incremental value might depend on the severity of the index event.

Disclosure of interest: No

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Population-based study of cognitive and neuropsychiatric outcomes at 3-4 years after stroke

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Background and aims: Stroke sequelae affect function, activity, and participation of stroke survivors. We assessed long-term prevalence and relationships between cognitive and neuropsychiatric consequences of stroke.

Methods: First-ever stroke survivors from a population-based cohort with ischemic stroke or intracerebral hemorrhage were followed-up 3-4 years after stroke via clinical visit or telephone. Fatigue was evaluated with the Fatigue Assessment Scale, cognition with Montreal Cognitive Assessment, and depression with Patient Health Questionnaire-9. We defined cut-offs for significant impairment for the three evaluations as ⩾24; ⩽24; and ⩾10 points, respectively. Mann-Whitney-U-test was used for comparisons between groups and Spearman's rho to assess correlation between outcomes.

Results: Two-hundred-and-two stroke survivors were followed-up after 3-4 years (median: 3.2;IQR:3.1-3.5). Median age was 72 years (IQR:65-79); median stroke severity was NIHSS 3 (IQR:2-8). The number of respondents was 173 (83%) for cognition; 195 (97%) for fatigue; and 191 (95%) for depression. Ninety-three (54%) respondents had cognitive impairment; 46 (24%) fatigue, and 21 (11%) depression. Among 169 participants who answered all three assessments, 100 (59%) had significant impairment in at least one of these domains. Participants with cognitive impairment were older than those without (median:75 vs. 67;p<0.01), but age did not differ across groups regarding fatigue or depression. Among 21 respondents with post-stroke depression, 20 (95%) also reported

Figure 1. Flowchart of 3-4-year follow-up process among 400 first-ever stroke patients

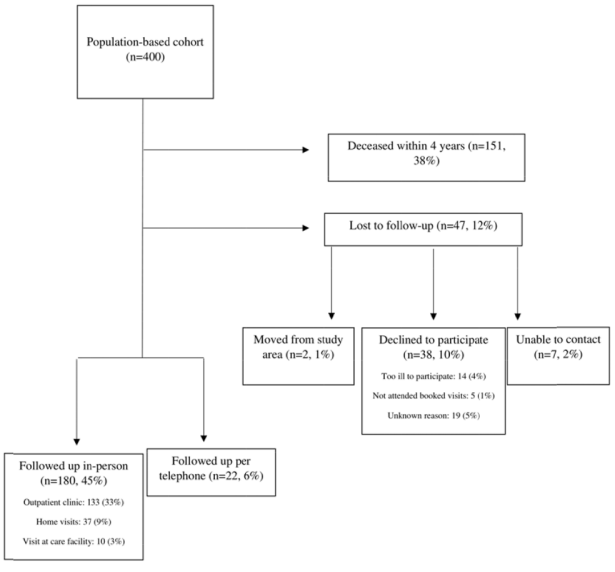
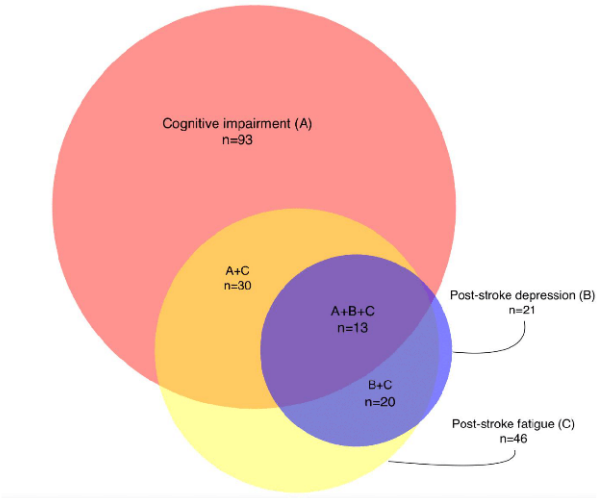


Figure 2. Proportional Euler diagram of the relationships between the three assessments

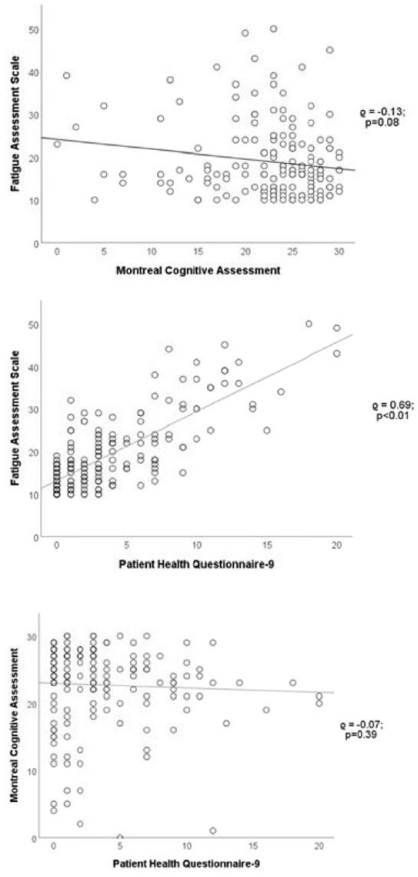


Cognitive impairment: ≥24 points, Montreal Cognitive Assessment

Post-stroke fatigue: ≤24 points, Fatigue Assessment Scale

Post-stroke depression: ≥10 points, Patient Health Questionnaire-9

Figure 3. Scatter plots, fit-lines and Spearman's rank-order correlation coefficients (ϱ) for relationships between the three included assessments



Montreal Cognitive Assessment range: 0-30; 0 = maximal cognitive impairment

Fatigue Assessment Scale range: 10-50; 10 = maximal fatigue

Patient Health Questionnaire-9 range: 0-20; 20 = maximal depression

post-stroke fatigue, and depression and post- fatigue were positively correlated (ρ=0.69;p<0.01).

Conclusions: Cognitive and neuropsychiatric problems are common 3-4 years after stroke. Post-stroke depression and fatigue correlate strongly, presenting a challenge in distinction between the two entities.

Disclosure of interest: No

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Late Improvement in Disability in Acute Ischemic Stroke Patients: Pooled Analysis of NINDS tPA, IMS-3, and ALIAS 1 and 2 Trials

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Background and aims: The rates and predictors of late improvement in disability (after 3 months) in acute ischemic stroke patients has not been systemically studied.

Methods: We analyzed data from three phase-III randomized multicenter clinical trials that recruited acute ischemic stroke patients within 3 to 5 hours of symptoms onset. Late improvement in disability was defined by achieving functional independence (modified Rankin Scale [mRS] of 0-2) at 12 months among patients with moderate to severe disability (mRS 3-5) at 3 months post stroke. We also identified independent predictors of late improvement in disability using multivariate analysis.

Results: Late improvement in disability was seen in 147 (19.5%) patients among a total of 754 patients with moderate to severe disability at 3 months (mean age ± SD; 68 ± 12 years) with acute ischemic stroke. In multivariate analysis, age <65 years (odds ratio [OR], 3.56; 95 % confidence interval [CI] 1.80 to 7.48; P = 0.0004), age 65-79 years (OR, 2.37; 95 % CI 1.23 to 4.90; P = 0.01), men (OR, 1.49; 95 % CI 1.00 to 2.22; P = 0.04), National Institutes of Health Stroke Scale [NIHSS] sore <10(OR, 5.78; 95 % CI 3.03 to 11.27; P < 0.0001), and NIHSS score 10-19(OR, 1.75; 95 % CI 1.06 to 2.97; P = 0.03) were at higher odds for experiencing late improvement in disability.

Conclusions: Late improvement in disability occurs in one fifth of acute ischemic stroke patients and should be considered in estimation of long-term outcome.

Disclosure of interest: No

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EFFECT OF AEROBIC FITNESS TRAINING ON PERIPHERAL ENDOTHELIAL FUNCTION IN SUBACUTE STROKE PATIENTS – RESULTS FROM THE PHYS-STROKE STUDY

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Background and aims: The effect of aerobic fitness training on peripheral endothelial function in subacute stroke patients is unknown.
Methods: Exploratory analysis of the multi-center, randomized-controlled *PHYS-STROKE* trial. Subacute stroke patients were randomized to either four weeks of aerobic fitness training or relaxation sessions. Participants received assessments of peripheral endothelial function pre- and post-intervention via the *EndoPAT*® system, measured as reactive hyperaemia index (RHI). Endothelial dysfunction (ED) was defined as an RHI $\leqslant$ 1.67. The effect of the intervention on the change of endothelial function was estimated using Generalized estimating equation/ANCOVA analyses.
Results: Of 167 patients participating in $\geqslant$ 15 (75%) sessions, 76 received a measurement of endothelial function at baseline. Median RHI was 1.62 [IQR: 1.29; 2.09] and 42 (55%) patients had ED at baseline. After the intervention, median RHI was 1.72 [IQR: 1.38; 1.98] and 34 (47%) participants had ED. In the aerobic fitness group, RHI values demonstrated a non-significant increase post-intervention compared to baseline (Coef. 0.20 [CI: -0.04; 0.44]). Higher age, acute NIHSS, and presence of diabetes mellitus and hypercholesterolaemia were associated with reduced RHI levels after the intervention (all $p < 0.05$). Time from stroke to the second *EndoPAT*® measurement was associated with higher RHI levels post-intervention (Coef. 0.02 [CI: 0.01; 0.02]). Sub-group analyses suggested a greater effect of aerobic fitness training on RHI levels in participants without hypercholesterolaemia or hypertriglyceridaemia.
Conclusions: Endothelial function improved over time in subacute stroke patients and might be enhanced through an early aerobic exercise compared to relaxation.
Disclosure of interest: No

2351

Death and functional outcome in stroke patients three years after discharge from an intensive rehabilitation hospital

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Background and aims: Early rehabilitation is recommended to maximize functional outcome in subacute post-stroke patients. Long-term functional status after rehabilitation is scarcely acknowledged. Our aim was to describe functional outcome in stroke patients three years after discharge from an intensive rehabilitation hospital.
Methods: This was a continuation of a single-centre, retrospective observational study enrolling consecutive adult stroke patients (ischaemic and haemorrhagic) admitted to IRCCS Fondazione Don Carlo Gnocchi in Florence for an intensive neurological rehabilitation, from January 2018 to June 2019. Patients were contacted by phone three years after discharge. Main study outcome was the modified Rankin Scale (mRS).
Results: Out of 201 patients enrolled, 154 replied to the telephone interview (mean age 74.66 $\pm$ 12.73, 51% male). At baseline, 95% of patients had a mRS score of 3-5. After 3 years, 50% of patients died (mRS=6, n=77), 45% had moderate-severe disability (mRS 3-5, n=69), only 5% of patients had mild disability (mRS 0-2, n=8). In multivariate logistic regression models, predictors of death were: age, (OR=1.12, CI-95%:1.06-1.18,), male sex [OR=2.62,CI-95%:1.11-6.19], neglect (OR= 4.62,CI-95%:1.24-17.30), length of hospital stay (OR=.99, CI-95%:.97-1.01) and diabetes (OR= 3.29, CI-95%:1.21-8.94). In multivariate Cox regression analysis age (HR= 1.06, CI-95%:1.03-1.09), length of hospital stay (HR= 1.02, CI-95%:1.01-1.02) and neglect (HR= 2.02, CI-95%:1.26-3.24) remained significant predictors of death.
Conclusions: Stroke is a severe disease with high mortality and poor functional status over the long-term despite early neurological rehabilitation. The presence of neglect at the time of stroke presentation seems a strong predictor of functional long-term outcome and death.
Disclosure of interest: No

2354

Evaluation of stroke rehabilitation services in the in-hospital phase: Findings from a tertiary care centre in India

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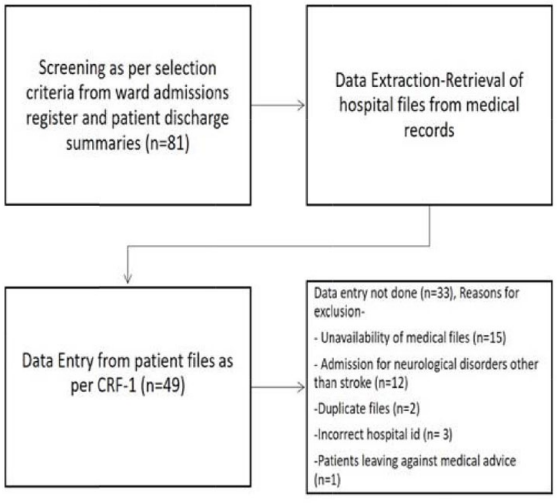
Background and aims: Stroke rehabilitation involves a multidisciplinary team providing comprehensive care to the patient. The functioning of Stroke Units (SU), highest evidence available for stroke care, is guided by the World Stroke Organisation's (WSO) roadmap of core recommendations and key quality indicators.
This study aims to evaluate the quality of stroke rehabilitation in comparison to the WSO core recommendations at a tertiary care centre in India
Methods: A mixed method design with an exploratory research model was used. The study was conducted in 2 phases including retrospective data extraction from medical records and telephonic follow-up on patient's functional status and adherence to physiotherapy post-discharge.



Results: The mean age of the sample was 56.9 $\pm$13years with approximately two third being males and a predominance towards ischaemic strokes (62%). Those with severe impairment on Fugl Meyer assessment were 28% of the sample. It was observed that there was inconsistent documentation of various core recommendations provided by WSO (<20%) while 16% of the services provided were not documented at all. Only two of the five key quality indicators of stroke rehab were documented.

Conclusions: This project started as an audit of the rehabilitation services provided at the comprehensive stroke care center based on the evidence based WSO KQI's. nadequacies in documentation were recognized, although patients received evidence-based rehabilitation. The results of this study have shown there is a need to improve documentation of services, additionally, there is a need for education and sensitization of healthcare staff on stroke care guidelines and protocols.
Disclosure of interest: No

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AEROBIC EXERCISE TRAINING IN ACUTE STROKE: A FEASIBILITY STUDY

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Background and aims: Pre-clinical studies demonstrate that aerobic exercise training (AET), initiated in the acute stroke period, reduces brain damage and neurological disability. This feasibility study determined if early-initiated AET is safe, acceptable and potentially beneficial for stroke survivors.
Methods: This randomised controlled feasibility study was designed to assess the safety and acceptability of a once daily moderate-intensity AET intervention (rating of perceived exertion = 13/20), delivered for 5 days using an in-bed exercise bike (MOTOmed, Letto 2, RECK, Germany). Feasibility outcome measures included: recruitment and attrition rate, and intervention fidelity, adverse events and protocol compliance (NCT04742686).
Results: 30 ischaemic stroke patients (mean [SD]: age 72.6 [16.2] years; BMI 27.6 [6.2] kg/m^2; NIHSS 8.5 [5.9]; 3.4 [1.67]; 2-7 days post-stroke) were recruited from hyper acute and acute stroke units in Sheffield, UK. Participants were randomised to usual care or intervention groups. Recruitment was completed in 13 months (2.3 participants/month). No adverse events related to the intervention occurred. 55 of 75 (73.3%) planned exercise sessions were undertaken. Reasons for missed sessions include: discharge from hospital (n=4), drop out (n=1) fatigue (n=1) and exclusion due to a pulmonary embolism (n=1; unrelated to intervention). All intervention participants perceived the exercise bike as comfortable.
Conclusions: Early AET using in-bed cycle ergometry is safe and acceptable for acute ischaemic stroke patients, including those with hemiparesis. The potential effects of this intervention on recovery biomarkers will be reported. These findings will support the design of a large-scale clinical trial to assess the efficacy of the intervention.
Disclosure of interest: No

RISK FACTORS AND PREVENTION DAY 1

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EXPOSURE TO HAZARDOUS SUBSTANCES IN OCCUPATIONAL/DOMESTIC SETTINGS AND PREVALENCE OF CEREBRAL SMALL VESSEL DISEASE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and aims: Age, vascular comorbidities, socioeconomics and education only partly explain small vessel disease (SVD) variance. We aimed to determine SVD prevalence according to workplace or domestic exposure to hazardous substances.
Methods: We registered on PROSPERO:CRD42021297800. We searched MEDLINE and EMBASE to 12/12/2021. We included studies assessing occupational substances/hazardous occupations including domestic exposures identified from EU/UK occupational safety authorities and radiological/clinical/pathological features of sporadic SVD. We extracted and pooled prevalence estimates using random-effects meta-analyses. We performed age-based meta-regression where>10 studies were available. We assessed quality using Risk of Bias Assessment Tool for Non-randomised Studies.
Results: Of 7,309 studies, 81 were included (n=43,556 participants, mean age=44.8 years);Fig.1. 54/81 studies reported poolable estimates. Substance/occupational exposure was ongoing/recent (<3months) in n=44, past (>3months-years) in n=23, n=14 unspecified. Pooled SVD prevalence in populations exposed to carbon monoxide was 83% (95%CI 62-94%, n=1258; 27 studies; mean age=45;Fig.2); carbon disulphide 73% (95%CI 54-87%; n=131; 3 studies; mean age=51); diving 24% (95%CI 5-67%; n=172; 4 studies; mean age=38); high altitude 49% (95%CI 40-58%; n=184; 6 studies; mean age=42). The samples were too small to reliably assess 1,2-dichloroethane and solvents including toluene. In meta-regression of carbon monoxide studies, age did not explain SVD variance. Meta-regression for exposure duration was not possible. We narratively reviewed contact sport, lead, military, and pesticide exposures as estimates were too varied. Most studies (65/81) reported unadjusted frequencies with high risk of bias. Heterogeneity varied 0-79%.
Conclusions: Occupational/domestic exposure to hazardous substances may be associated with SVD. High-quality, longitudinal, covariate-adjusted studies are needed.

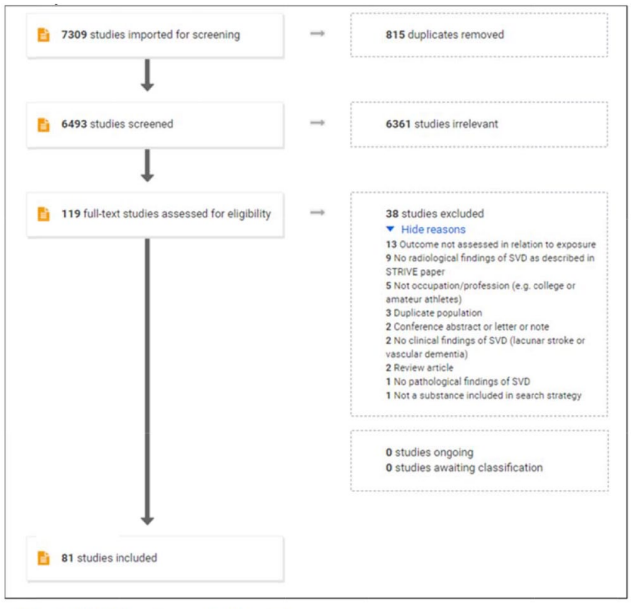

Figure 1. PRISMA flow diagram of study selection

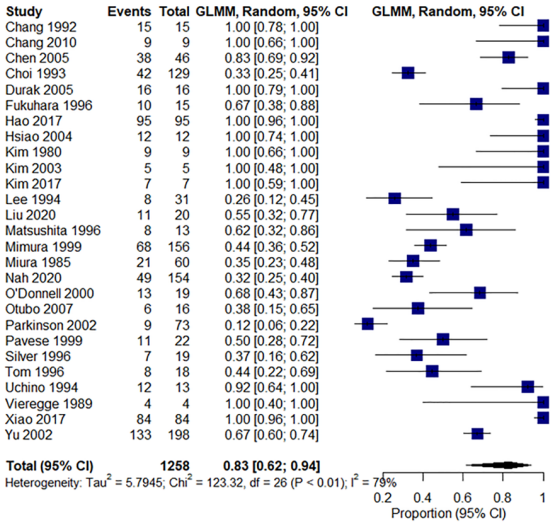

Figure 2. SVD prevalence in populations exposed to carbon monoxide; 27 studies; mean age = 45.2 years

Disclosure of interest: No

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Heart team for stroke prevention in patients with atrial fibrillation without any antithrombotic therapy: epicardial appendage closure

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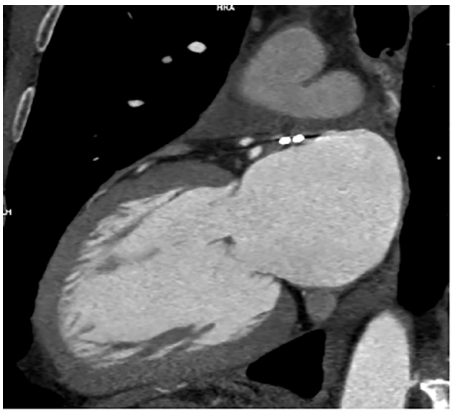
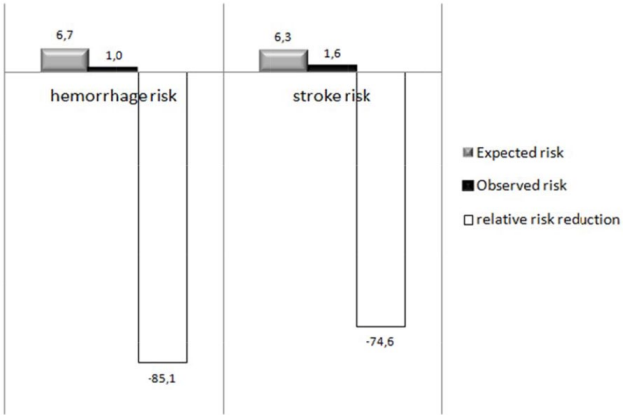
Background and aims: left atrial appendage occlusion is a rapidly diffusing therapeutic option. All endocardial devices require mandatory antithrombotic therapy and are associated with device related thrombosis and peridevice leaks, requiring reintroduction of aggressive antithrombotic therapy leaving unmet some clinical need as bleeding remains an issue with antithrombotic therapy. Appendage exclusion with an extravascular device does not require any antiplatelet, avoid thrombosis and leaks but data are limited. Here we present the largest series and longest follow up of patients undergone epicardial appendage closure without any antithrombotic therapy for stroke ad hemorrhage prevention in patients with atrial fibrillation poor tolerant to anticoagulants.

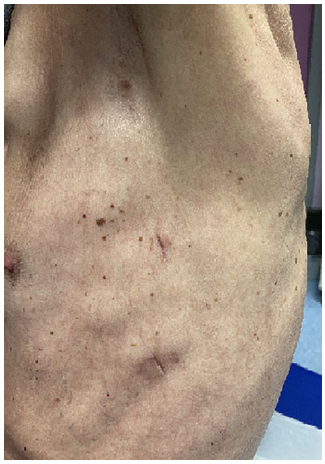
Methods: One hundred and eighty five patients with atrial fibrillation after heart team evaluation underwent totally thoracoscopic epicardial appendage occlusion (male 68.8%,mean age 76.4±6.6,mean CHA_2DS_2VASc 5.1± 1.8,HASBLED 3.5±1.1, previous blood transfusions 47.6% previous stroke 35.6%). Indications were: neurological 39.4%, GI bleeding 37.3%, miscellaneous 20.4% .No antithrombotic therapy was prescribed from the day of surgery to the latest follow up.

Results: Procedural success was 99.8%, no devices related complications were reported. Mean procedural time and hospital stay were 31.7±16.3 minutes and 3.2±0.9 days respectively. At mean follow up of 36±19.1 months without any antithrombotic therapy, stroke and hemorrhage rate were 1.6% and 1.0% with relative risk reduction of 74.6% and 85.1% according to CHA_2DS_2Vasc and HASBLED respectively.

Conclusions: Totally thoracoscopic epicardial appendage closure without any antithrombotic therapy seems to be promising for stroke and hemorrhage prevention when bleeding risk reduction need to be minimized in patients with atrial fibrillation.







Disclosure of interest: No

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Acute Ischaemic Stroke without Standard Modifiable Risk Factors has Lower Mortality

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Background and aims: Little is known of the prognosis of patients with acute ischaemic stroke in the absence of **s**tandard **m**odifiable str**o**ke **r**isk **f**actors (SMoRFs). In acute coronary syndrome, patients without modifiable risk factors have a higher mortality rate. We analysed data from the Swedish Stroke Register to determine survival of patients without SMoRFs following an ischaemic stroke.
Methods: We identified adults patients with first-presentation acute ischaemic stroke between 2010-2020. Patients were considered to possess a SMoRF if they had one of: hypertension, diabetes, hyperlipidaemia, atrial fibrillation, or an active smoking history. We compared mortality in patients with and without SMoRFs at one, three, and twelve months post-stroke via logistic regression modelling.
Results: Of 152,588 patients with ischaemic stroke, hypertension (58.5%) and atrial fibrillation (27.2%) were the most common risk factors. 34,019 patients (22.3%) had no SMoRFs. At 1 month, after adjusting for age, sex, and level of consciousness at presentation, mortality in patients without SMoRFs was lower than in patients with any SMoRF (6.6% vs 10.5%, aOR:0.81; 95% CI:0.77-0.85). Significant mortality differences persisted at three (9.2% vs. 14.6%, aOR:0.79; 95% CI:0.76-0.83) and twelve months (13.2% vs. 20.9%, aOR:0.76; 95% CI:0.73-0.79).
Conclusions: One in five patients with acute ischaemic stroke had no standard modifiable stroke risk factors. These patients have lower risk of short and long-term mortality compared to patients with one or more SMoRFs, the converse to that found in acute coronary syndromes. The reasons for these discrepancies should be further explored.
Disclosure of interest: No

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ATRIAL FIBRILLATION IN PATIENTS WITH LARGE AND SMALL VESSEL ISCHEMIC STROKE: LONG-TERM FOLLOW-UP RESULTS FROM THE STROKE AF RANDOMIZED TRIAL

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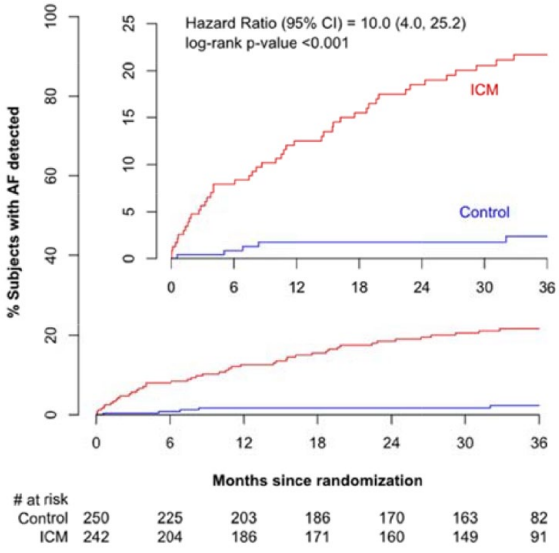
Background and aims: At 12-months, the STROKE-AF trial found 12.1% of AF using an insertable cardiac monitor (ICM) vs. 1.8% with standard of care (SOC) in patients with large- or small-vessel ischemic stroke. This pre-defined secondary analysis compared it with the 36-month incidence rate of AF.
Methods: Prospective, randomized, controlled, multicenter trial comparing the AF incidence rates detected via ICM (n=242) vs SOC (n=250) in patients with an ischemic stroke attributed to small- or large-vessel disease and no known AF. Patients were aged ⩾60 years (or 50-59 with an additional stroke risk factor), had an index stroke ⩽10 days prior to ICM, and no contraindication to oral anticoagulation.
Results: The AF incidence rate at 3-years in the ICM vs SOC arms was 21.7% vs 2.4% (hazard ratio [10.0]; 95% CI, 4.0-25.2; p<0.001) per Kaplan-Meier estimates (Figure). No significant differences were observed between stroke subtypes. Among ICM patients with AF, 67.4% had an episode lasting ⩾1 hour. There was no significant difference in the rates of recurrent stroke between the ICM and SOC arms at 3 years (17.0% vs 14.1%, HR 1.10; 95% CI 0.67-1.78; p=0.71). Additional results will be available during the presentation.
Conclusions: At 3 years, approximately 1 in 5 pts with ischemic stroke attributed to small- or large-vessel disease had AF detected via ICM, a 10-fold increase vs SOC. This result is important because unsuspected AF may increase the risk of subsequent cardioembolic stroke in a population typically not considered for AF detection and management.



Disclosure of interest: Yes

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INFLUENCE OF THE GUT MICROBIOME IN ISCHEMIC STROKE RISK AND ISCHEMIC STROKE OUTCOME

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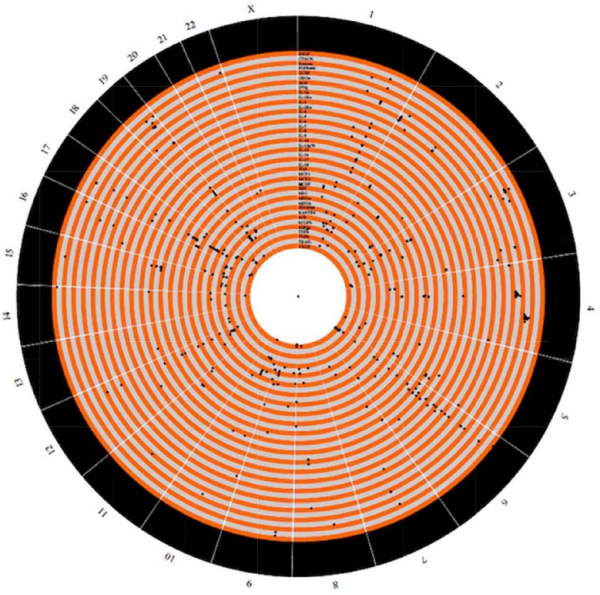
Background and aims: In animal models, the composition of the gut microbiota is a modifiable factor associated with the risk of stroke and post-stroke neurological outcome. We aimed to identify microbiota taxa associated with ischemic stroke (IS) risk, neurological outcome in the acute phase, and functional outcome at 3 months post-stroke in patients with IS.

Methods: Observational study in a Tertiary Stroke Centre (January 2020 – April 2022). We studied the first faecal sample after IS in 156 patients and we included 19 controls. We performed shotgun metagenomics sequencing to analyse the taxonomic profile. We estimated the α- and β-diversity, and we tested the differential relative abundance of taxa using Negative Binomial Generalized Linear Model in different comparisons: case/control, minor (NIHSS<5)/moderate (NIHSS=5-15)/severe (NIHSS>15) IS, neurological deterioration < 24h (ΔNIHSS⩾4), and 3-months functional outcome (poor if mRS⩾3). Analyses were adjusted for age, sex, baseline NIHSS, and stroke subtype (TOAST classification).
Results: We identified higher α-diversity in those IS patients with higher 24h post-stroke severity, as well as differences in the β-diversity regarding baseline IS severity. IS risk was associated with *Fusobacterium* (p=2.41x10-5). Higher baseline and 24h stroke severity were associated with *Spahylococcus aureus* (p=9.17x10-8) and *Robinsoniella* (p=1.80x10-12), respectively. Neurological evolution was associated with *Verrucomicrobiae* (p=1.93-x10-3). *Pseudomonas* (p=7.47x10-6) and *Enterococcus* (p=2.11x10-4) were associated with 3-months functional outcome.
Conclusions: We found multiple new taxonomic profiles associated with IS, revealing that gut microbiome could be an important factor associated with IS risk and IS acute and long-term outcome.
Disclosure of interest: No



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DISMANTLING THE GENETIC ARCHITECTURE OF INFLAMMATORY PATHWAYS IN CARDIOVASCULAR DISEASE

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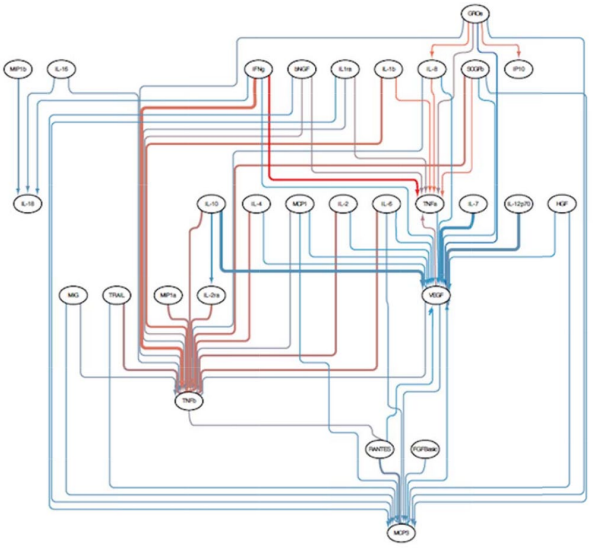
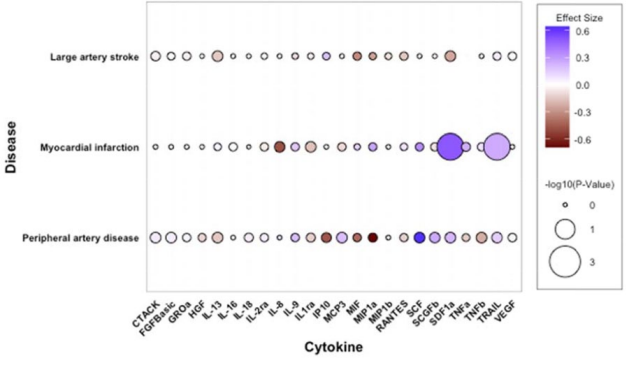
Background and aims: Cytokines are major mediators of inflammation and contributors to atherosclerosis and cardiovascular disease. We applied genome-wide association study (GWAS) to analyze the genetic architecture of circulating cytokines and post-GWAS analyses to study their interplay with cardiovascular endpoints in order to detect promising therapeutic targets.
Methods: We performed GWAS meta-analysis for 41 cytokines using publicly available summary statistics in up to 80,067 individuals from three consortia. The identified significant loci were leveraged for downstream post-GWAS analyses.
Results: Through GWAS meta-analysis we found 419 significant loci associated with circulating cytokines ($p < 5\times10^{-8}$), which explained up to 7% of their variance (Figure A). Functional annotation mapped 79% of significant SNPs ($p < 5\times10^{-8}$) to intronic and intergenic regions, whereas gene-based analyses prioritized genes enriched in immune response pathways and expression in liver, lung, and spleen. In an mendelian randomization-transcriptome-wide association study (MR-TWAS) approach, we found that genetically predicted expression in peripheral blood of 265 genes, most of them involved in immune response processes, significantly influences cytokines levels. We identified strong relationships between multiple cytokines with genetically predicted levels of GROa, IFNg, SCGFb, bNGF, IL1ra, IL-8, IL-10, IL-6, MCP-1, VEGF, and RANTES influencing the levels of at least three other cytokines (Figure B). In MR analyses for cardiovascular endpoints, we found significant associations between genetically predicted TRAIL and SDF1a levels with myocardial infarction (Figure C).
Conclusions: Our findings highlight the genetic architecture of circulating cytokines and identifies cytokines with potential as therapeutic targets for cardiovascular disease.





Disclosure of interest: No

748

Dissecting the effects of interleukin-6 signaling on atherosclerosis: a proteome-wide Mendelian randomization study

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Background and aims: Genetic and experimental studies support a causal involvement of interleukin-6 (IL-6) signaling in atheroprogression. However, any benefits must be balanced against an impaired immune response. Dissecting the atheroprotective effects of IL-6 signaling could offer insights about novel, more specific drug targets.
Methods: Using Mendelian randomization (MR), we proxied the effects of a genetic instrument of IL-6 receptor inhibition on 3,281 plasma proteins in the INTERVAL cohort. Using mediation MR, we explored proteomic mediators of the effects of IL-6 signaling on coronary artery disease, large artery atherosclerotic stroke, and peripheral artery disease. For significant mediators, we tested associations with incident cardiovascular events and explored the histological, transcriptomic, and cellular phenotypes correlated with their expression in human atherosclerotic lesion samples.
Results: We found significant effects of genetically proxied IL-6 signaling on 70 circulating proteins, consistent with the proteomic effects of pharmacological IL-6R inhibition. Among the significant proteins, genetically proxied circulating levels of CXCL10 were associated with risk of all three cardiovascular endpoints with up to 67% of the effects mediated by decreases in CXCL10. Higher midlife circulating CXCL10 levels were associated with incident cardiovascular events over 20 years, whereas higher CXCL10 expression in human atherosclerotic lesions correlated with a larger lipid core and a transcriptomic profile reflecting immune cell infiltration, adaptive immune system activation, and cytokine signaling.
Conclusions: Integrating multiomics data, we found CXCL10 as a potentially causal mediator of IL-6 signaling on cardiovascular disease and thus could serve as a promising drug target for atheroprotection.
Disclosure of interest: No

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Association between deprivation and post-stroke outcomes: 10-year follow-up from a population-based cohort study of all strokes in Oxfordshire, UK

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Background and aims: Socioeconomic deprivation is associated with an increased risk of stroke. However, there is scant evidence on its impact on long-term stroke outcomes. We investigate its impact on mortality, functional outcome, quality-of-life (QoL) and quality-adjusted life-expectancy (QALE).
Methods: In a prospective population-based cohort, deprivation (based on residential postcode and stratified into quartiles using the national cut-points for England) was related to 10-year mortality, disability (modified Rankin Scale>2), QoL (Euroqol-5Dimensions), and QALE after first-in-study stroke. Cox, logistic and ordinary least squares regression were used to adjust for age, sex, previous comorbidity/disability, risk factors, stroke severity, smoking, marital status and years of education.
Results: Among 2,540 strokes (1,299 females), with mean follow-up of 4.8 (S.D.3.8) years, 582 (23%) had premorbid disability, which was associated with higher deprivation (Q4 vs Q1, adjusted OR=2.64, 95%CI:1.17-5.93, p=0.019). After adjustment, increasing deprivation was not associated with mortality (p=0.93), but was with post-stroke disability (p=0.040), with patents in the most deprived quartile being 2.09 (1.03-4.24) times more likely to be disabled than the least deprived. After adjustment, deprivation was also associated with decreased post-stroke health-related QoL (p=0.005) and QALE (p=0.020), with the 4.09 (3.77-4.42) QALYs in the least deprived quartile reduced by 0.5 (-0.98 to -0.07) years in the two most deprived quartiles.
Conclusions: Although deprivation is associated with increased pre-morbid disability, post-stroke functional outcome, QoL and QALE are substantially worse in deprived patients after adjustment for confounders, suggesting a causal link with poor outcomes and hence with possible potential for intervention.
Disclosure of interest: No

926

Clinical outcomes of radiation-induced carotid stenosis

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Background and aims: Clinical outcomes of radiation-induced carotid stenosis are still unclear. Therefore, this study is aimed to evaluate the short-term and long-term outcomes after surgery for radiation-induced carotid stenosis.
Methods: PubMed, EMBASE, the Cochrane Library and Web of Science were searched for relevant RCTs and observational studies which reported short- and long- term outcomes after carotid endarterectomy (CEA) and carotid angioplasty and stenting (CAS) for carotid stenosis induced by radiation. Risk of bias were assessed through different scales according to study design. I^2 statistic were used to evaluate the heterogeneity, and meta-regression and sub-group analysis were performed to investigate the source of heterogeneity.
Results: A total of 26 studies with 1002 patients were included. CEA was performed in 364 patients and CAS in 638 patients. The estimated

rate of short-term stroke was 0.19% (95% CI=0-0.90%), and the rate of long-term stroke was 2.68 % (95% CI=1.19-4.57%). The rate of CNI in CEA group was significantly higher than that in CAS group [risk ratio (RR)=6.03, 95% CI=1.63-22.22, *P*=0.007)], however, there was a tendence of decreasing year after year. The univariate meta-regression analysis showed that the risk of stroke in CAS group were significantly higher than CEA group in both short-and long term [incidence rate ratio (IRR) =3.62, 95% CI=1.21-10.85, *P*=0.22; IRR=2.95, 95% CI=1.02-8.59, *P*=0.046), respectively].

Conclusions: This study provided the worldwide profile of outcome of treatment for radiation-induced carotid stenosis, and also found that CEA can yield better results for these patients than CAS.

Disclosure of interest: No

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Risk of cerebrovascular events with intensive lipid control among direct oral anticoagulant users: A population-based analysis

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Background and aims: Despite the efficacy in ischemic stroke (IS), stringent lipid control with statins maybe associated with increased intracerebral hemorrhage (ICH) in the general population. Whether the ICH risk is accentuated by direct oral anticoagulant (DOAC) is unclear. We aimed to determine the efficacy and safety of intensive lipid control among DOAC users on statins.

Methods: We performed a population-based retrospective cohort study that included DOAC recipients taking statins from January 2015 to December 2020 in Hong Kong. Primary outcome was IS, secondary outcomes were ICH and all-cause mortality. We correlated study outcomes with low-density (LDL-C), high-density (HDL-C) lipoprotein cholesterol and statin intensity using multivariable time-dependent marginal structural Cox models. We performed subgroup analyses for patients with atrial fibrillation (AF) and history of IS.

Results: During the 6-year period, 47,687 DOAC recipients received statins. LDL-C <1.94mmol/L (aCSHR[95%CI]: 0.8[0.77-0.84], p<0.001) and HDL-C >1.0mmol/L (aCSHR[95%CI]: 0.77[0.68-0.87], p<0.001) were associated with reduced IS. Very low LDL-C levels were associated with ICH (<1.13mmol/L, aCSHR[95%CI]: 1.12(1.01-1.24), p=0.023) and death (<1.4mmol/L, aCSHR[95%CI]: 1.04[1.01-1.06], p<0.001). High-intensity statins were associated reduced IS (aCSHR[95%CI]: 0.79[0.66-0.94], p=0.009) but not ICH and death. Observations were similar in patients with AF (n=45,493) and IS history (n=16,089), except for non-significant associations between LDL-C and ICH.

Conclusions: A treat-to-target approach of LDL-C 1.94mmol/L by moderate-to-high intensity statins was safe and efficacious in preventing IS among DOAC users on statins. As very low LDL-C was associated with ICH and death, these patients should receive regular monitoring of lipid profiles and medication adjustment if necessary.

Figure 1. Multivariable analysis of LDL-C on IS among patients with concurrent DOAC and statins.

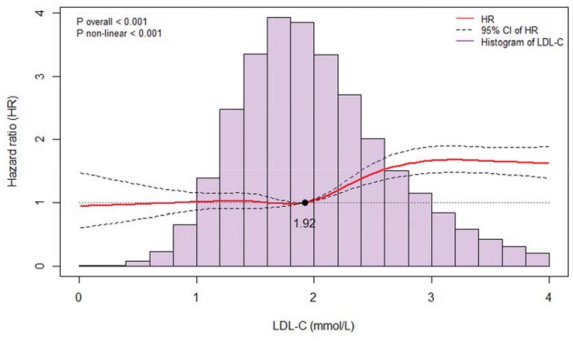


Figure 2. Multivariable analysis of LDL-C on ICH among patients with concurrent DOAC and statins.

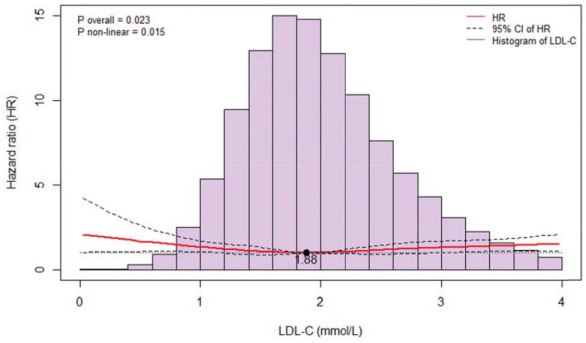
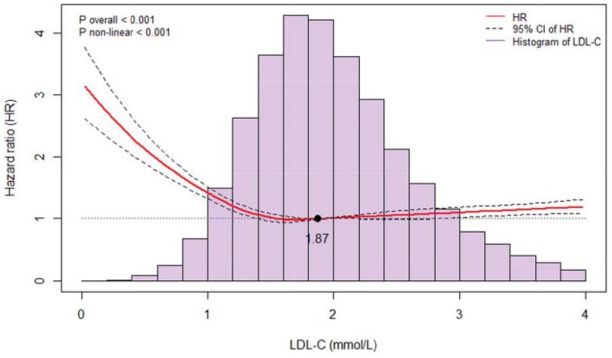


Figure 3. Multivariable analysis of LDL-C on all-cause mortality among patients with concurrent DOAC and statins.



Disclosure of interest: No

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EFFECT OF SHORT-TERM EXPOSURE TO AIR POLLUTION ON DAILY CARDIO- AND CEREBRO-VASCULAR HOSPITALIZATIONS IN AREAS WITH A LOW LEVEL OF AIR POLLUTION

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Background and aims: Evidence regarding short-term effect of air pollution on cardio- and cerebro-vascular hospitalizations in areas with relatively low air pollution levels is limited. Therefore, this study aims to examine the effect of short-term exposure to different air pollutants on hospital admissions due to cardio- and cerebro-vascular diseases in rural and regional Australia with low air pollution.
Methods: The study was conducted in five local Government areas of Hunter New England Local Health District (HNE-LHD). Hospitalization data from January 2018 to February 2020 (820 days) were accessed from the HNE-LHD admitted patients' dataset. Poisson regression model was used to examine the association between the exposure (air pollutants) and outcome variables (stroke hospitalizations).
Results: In single pollutant models, SO_2 and NO_2 significantly increased the daily number of cardio and cerebrovascular hospitalizations. The highest cumulative effect for SO_2 was observed across lag 0-3 days (Incidence Rate Ratio, IRR: 1.77; 95% Confidence Interval, CI: 1.18-2.65; p-value: 0.01), and for NO_2, it was across lag 0-2 days (IRR: 1.13; 95% CI: 1.02-1.25; p-value: 0.02). In contrast, higher O_3 was associated with decreased cardio- and cerebro-vascular hospitalizations, with the largest effect observed at lag 0 (IRR: 0.94; 95% CI: 0.89-0.98; p-value: 0.02). In the multi-pollutant model, the effect of NO_2 remained significant at lag 0 and corresponded to a 21% increase in cardio- and cerebro-vascular hospitalisation (95% CI: 1%-44%; p-value = 0.04).
Conclusions: Gaseous air pollutants, particularly NO_2, were positively associated with increased cardio- and cerebro-vascular hospitalizations even at concentrations below the national benchmarks.
Disclosure of interest: No

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SEX DIFFERENCES IN OUTCOMES AFTER ENDOVASCULAR TREATMENT OF LARGE VESSEL OCCLUSION POSTERIOR CIRCULATION STROKE: RESULTS FROM THE MR CLEAN REGISTRY

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Background and aims: Women with large-vessel occlusion anterior circulation stroke have worse outcomes after endovascular treatment (EVT) than men. Whether these disparities also exist in large-vessel occlusion posterior circulation stroke (PCS) remains uncertain. We assessed sex differences in functional, clinical, and radiological outcomes in patients with PCS treated with EVT.
Methods: We included consecutive patients with PCS from the MR CLEAN Registry (2014–2018) who received EVT. Primary outcome was the score on the modified Rankin Scale (mRS) at 90-days assessed with both multivariable ordinal and logistic regression analyses. Secondary outcomes included NIHSS at 24-48h after EVT, complication rates and successful reperfusion (eTICI 2B-3) grades analysed with multivariable logistic and linear regression analyses.
Results: We included 264 patients (42% women). Compared with men, women were older (median age: 68 versus 63 years), more often had prestroke disability (mRS⩾1: 37% versus 30%) and less often received IV thrombolysis (45% versus 56%). Clinical outcomes were similar between sexes (median mRS score 4 in women versus 5 in men, adjusted common OR 0.78 [95%CI 0.46-1.30]; favourable outcome [mRS⩽3] 50% versus 43%, adjusted OR 1.44 [95%CI 0.78-2.66]; mortality 32% versus 29%, adjusted OR 1.10 [95%CI 0.57-2.16]). In addition, NIHSS at 24-48h, complication rates and successful reperfusion grades did not differ between men and women.
Conclusions: Unlike in anterior circulation stroke, female sex is not associated with worse outcomes after EVT in posterior circulation stroke despite higher age, more frequent prestroke disability and less frequent treatment with IV thrombolysis in women.
Disclosure of interest: No

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EVALUATION OF AN ARTIFICIAL INTELLIGENCE (AI) ENHANCED APPLICATION FOR HYPERACUTE STROKE USING CLINICAL SIMULATION

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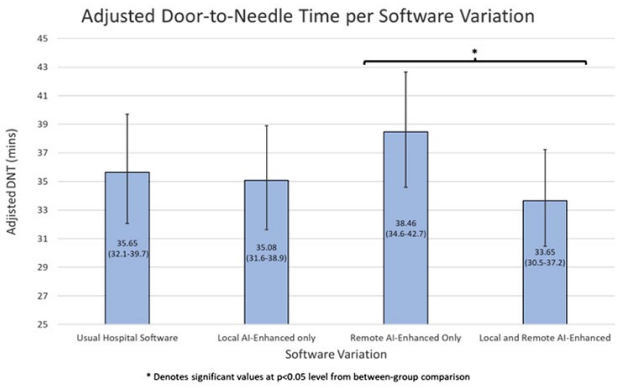
Background and aims: Shorter door-to-needle time (DNT) improves thrombolysis outcomes in acute ischaemic stroke. We describe simulation-based evaluation of an AI application which uses natural language processing of electronic health records (EHR) and image preparation to aid clinical review. We aimed to determine effects on DNT.
Methods: We undertook a prospective randomised study in a clinical simulation environment. 6 cases were selected from a cohort of acute stroke presentations to represent various scenarios (wake-up, frailty etc.), while maintaining comparable complexity with each other (though considering factors influencing decision-making (DeBrun,2018)).
Sessions involved 6 simulations in random order, beginning with pre-alert and ending with thrombolysis decision. Simulations included 2 teams (local doctor and/or nurse; and remote senior medical decision-maker), each randomly assigned either hospital standard or AI-enhanced software access for review.
DNT determined from video recordings was adjusted for simulation artefacts (e.g. shortened patient transfers). Participants completed questionnaires post-session. Ethical approval was not required.
We determined the effect of software variation on DNT using linear mixed modelling (LMM), adjusting for case order and group.
Results: 41 participants completed 51 simulations (average per-participant 2.8(2-3), average team size 2.8(2-3)). The combination of local and remote AI software access significantly reduced DNT($p<0.05$)(fig.1).
82% of participants preferred AI-enhanced software. System usability score was 72 /100(95%CI:68-76).
Conclusions: In a clinical simulation environment, AI-enhanced software to assist EHR and imaging review of potential thrombolysis case reduced DNT and had high clinician acceptability, compared with standard systems. A clinical simulation environment may be suitable to evaluate novel workflow-enhancement technology.



Disclosure of interest: No

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EFFECTIVENESS OF A TELEHEALTH-BASED BEHAVIORAL LIFESTYLE PROGRAM FOR HYPERTENSION CONTROL IN AFRICAN AMERICANS: RESULTS FROM HEALS MED-TECH RANDOMIZED CONTROLLED STUDY

Sunita Dodani Dodani*[1], Amanda Clarke[1], Ismail EL Moudden EL Moudden[1]
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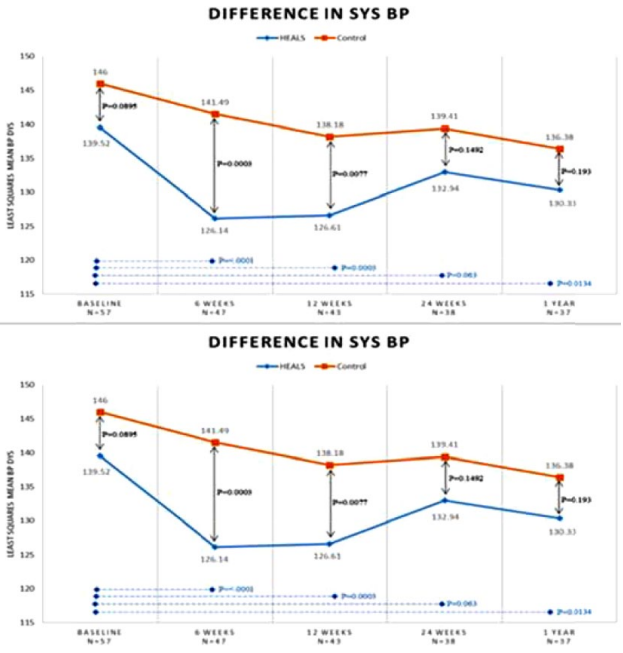
Background and aims: Hypertension (HTN) is a major risk factor for stroke, and higher among African Americans (AAs). The one-year HEALS Med-Tech (HMT) behavioral lifestyle program provided significant solutions to address HTN-related disparities in AAs. Presented are findings from one-year HMT program on HTN control and improvement in DASH diet and exercise in AAs.
Methods: This is a randomized control trial implemented in primary care clinic setting. HMT includes a) HEALS (Healthy Eating and Living Spiritually),12-month behavioral lifestyle program; b) Med-component, provides HTN management through medications and social support; and c) Tech-component, provides interactive telehealth by mobile phone. Primary outcomes are changes in blood pressure. Mixed Model for repeated measures was performed to examine effects of intervention on outcomes.
Results: 61 participants (50 females; 11 males) enrolled and randomized to either HMT or standard care (Control). Participants' mean age is 63 years with family history of heart disease, CVD, and diabetes. At baseline, the SBP was 139.52 mmHg and 146 mmHg for HMT and Control groups, respectively. The SBP was significantly reduced after 1 year (p=0.0134) in HMT group.
Conclusions: HMT intervention proves effective in significantly reducing SBP after one year, further fostering the acceptability of behavior change interventions among marginalized AAs. The fluctuation of DBP reduction can be attributed to several limitations, like COVID-19 fatigue, reversal of behavior modification due to the length of the study, and other co-morbidities. The results suggest the need for studies of longer duration to address social determinants for the programs to be sustainable.
Disclosure of interest: No



609

REAL WORLD DATA IN MECHANICAL THROMBECTOMY – WHOM ARE WE LOOSING TO FOLLOW-UP?

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Background and aims: Missing outcome data (MOD) is common in trial and registry data and a potential bias when drawing conclusion from this data. Identifying factors associated with MOD may help to increase follow-up rates within clinical studies and assess the need for imputation strategies. We aim to investigate MOD in a multicentric, prospective registry study of routine-care mechanical thrombectomy (MT) in large vessel occlusion ischemic stroke.
Methods: 13.082 patients enrolled in the German Stroke Registry Endovascular Treatment (GSR-ET) from May 2015-December 2021 were analyzed with regard to MOD (mRS at 90-day follow-up). Univariate logistic regression analyses were performed to identify factors associated with MOD in patients that were well documented with regard to basic patient, stroke and treatment characteristics (age, sex, admission NIHSS, intravenous thrombolysis, post-MT-TICI) and clinically followed-up until discharge (mRS).
Results: We report 19.7% (2,580/13,082) of patients with MOD at 90-day follow-up. 1,706 (66.1%) were well documented until discharge from treating hospital. Factors associated with MOD at 90-day follow-up were higher

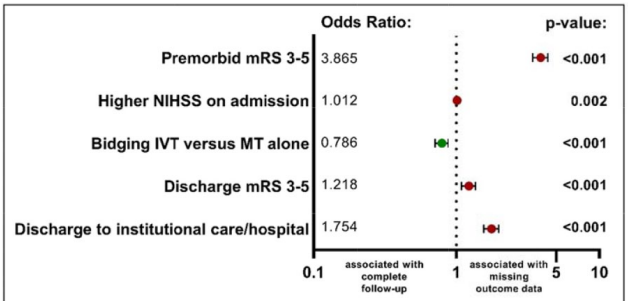

Figure 1: Odds Ratios with 95%CI and p-values of factors associated with missing clinical outcome data (MOD) in patients who were discharged from hospital and had MOD despite well-documented baseline characteristics resulting from logistic regression analyses. Red: associated with MOD, green: associated with complete follow-up under a threshold of p<0.05. Abbreviations: MT: mechanical thrombectomy, IVT: intravenous thrombolysis, NIHSS: National Institute of Health Stroke Scale, mRS: modified Rankin Scale score.

premorbid disability (mRS 3-5, OR[95%CI]: 3.865 [3.408-4.383], p<0.001), absence of bridging intravenous thrombolysis (OR[95%CI]: 0.786 [0.707-0.873], p<0.001), higher stroke severity displayed by higher NIHSS on admission OR[95%CI]: 1.012 [1.004-1.019], p=0.002) and discharge mRS 3-5 (OR[95%CI]: 1.218 [1.089-1.362], p<0.001) and discharge to institutional care or hospial (OR[95%CI]: 1.754 [1.558-1.976], p<0.001).
Conclusions: MOD in routine care registry data of MT is not random. Especially in case of higher pre- and post-stroke disability and discharge to hospital or institutional care, increased efforts to perform clinical follow-up are needed.
Disclosure of interest: No

1202

SEX DIFFERENCES IN RISK FACTORS AND OUTCOMES FOR STROKE IN ULAANBAATAR, MONGOLIA

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Background and aims: Limited data exist of sex and gender disparities in risk factors and clinical outcome after stroke in low-resource settings.
Methods: Population-based study of stroke in adult (age ⩾16 years) residents of 6 urban districts of Ulaanbaatar, Mongolia between 1 January 2019 and 31 December 2020. Data were collected on socio-demography, medical history, hospital management, and outcomes of functional recovery (modified Rankin scale) and HRQoL (EuroQol EQ-5D-3L) assessed at 90 days. Multivariate logistic regression and linear regression were used to explore associations between sex and outcomes.
Results: 2260/2962 (76.3%) patients (mean age 58.4±12.8, female 40%) were admitted to hospital. Females were older, less likely to have hypertension, smoke or consume alcohol but were more likely to have subarachnoid haemorrhage than males. There were no significant sex differences in blood pressure and stroke severity at admission. However, males had a longer time from stroke onset to first CT versus females (median 12.0 vs. 8.0 hrs). There were no significant differences between females vs. males on death or dependency (adjusted OR 0.79, 95%CI 0.61-1.01), unfavourable shift of mRS (0.82 [0.68-1.00]) and EQ-5D utility index (coefficient 0.007, -0.017-0.031) at 90 days.
Conclusions: Females with stroke in Mongolia were older but have fewer risk factors than males. There were no sex differences in functional recovery and HRQoL after stroke.
Disclosure of interest: No

1204

INTERHOSPITAL TRANSFER FOR ENDOVASCULAR STROKE TREATMENT IN CANADA: RESULTS FROM THE OPTIMISE REGISTRY

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Background and aims: Interhospital transfer of patients with a large vessel occlusion (LVO) for endovascular thrombectomy (EVT) has been associated with treatment delays.
Methods: We analysed data from Optimizing Patient Treatment In Major Ischemic Stroke with EVT (OPTIMISE), a quality improvement registry to support EVT implementation in Canada. We assessed differences in baseline characteristics, time metrics and procedural outcomes between patients with LVO transferred for EVT and those directly admitted to an EVT-capable center.
Results: Between 1/1/2018 and 31/12/2021 a total of 6,083 patients received EVT in 20 participating centres (median age 73 years, 50% women, 50% treated with IV thrombolysis). Patients transferred for EVT (n=3,376) had lower rates of M2 occlusion (22% vs. 27%) and higher rates of basilar occlusion (9% vs. 5%) compared to those directly admitted to an EVT-capable centre (n=3,373). Door-to-needle times were shorter in patients receiving IV thrombolysis prior to transfer compared to those presenting directly to an EVT centre (32 vs. 36 minutes). Patients transferred for EVT had shorter door-to-groin puncture times (37 vs. 85 minutes) but longer last seen normal-to-groin puncture times (322 vs. 181 minutes) compared to those admitted directly to an EVT-capable centre. Groin puncture-to-reperfusion times, successful reperfusion rates (85% vs. 86%) or adverse periprocedural events were similar between the two groups.
Conclusions: Patients transferred for EVT experience significant delays from the time they were last seen normal to the initiation of EVT. The time to EVT was minimized through more rapid door-to-puncture. Improving door-to-puncture time for all patients is required.
Disclosure of interest: No

1298

Strokes in Bishkek, Kyrgyz Republic between 2004 and 2019

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Background and aims: The epidemiology of stroke, like any other non-communicable disorder, changes over time. This retrospective study was designed to describe the long-term dynamics (2004–2019) of the stroke morbidity, mortality rates in Bishkek by age and gender using the Stroke Registry data.
Methods: During the analyzed period, 23,299 cases of stroke were registered, including 15,965 cases of ischemic stroke (IS), 4,975 cases of hemorrhagic stroke (HS), and 2,359 cases of cryptogenic strokes.
Results: For 15 years the frequency of IS (4.0%) have declined moderately, in HS (9.0%) and cryptogenic strokes (26.0%) significantly. Mortality decreased in all strokes (IS-13.0%, HS 13.6%), especially in cryptogenic ones (37.7%) compared to 2004.
Analysis by age showed that the incidence of IS increased from 2.5% (<40 years) to 51.0% (>70 years). Mortality from IS also increased by 2.3-4 times for each ten-year age period. The incidence of IS in age group >70 years is higher in women (32.7%) than in men (18.3%) (p<0.002). Also, HS deaths rate in women (47.3%) is 2 times higher than in men (23.5%) (p<0.05).

Conclusions: Morbidity and mortality rates from all types of stroke in Bishkek have decreased over the years. IS are observed in more than half of the cases in people over 70 years. High morbidity and mortality rates from IS and HS prevail in females over 70 compared to the males perhaps due to the predominance of the number of women at this age.
Disclosure of interest: No

SERVICE ORGANISATION DAY 1

1585

Real world evidence of the efficacy of Mechanical thrombectomy in the UK: Results from nationwide stroke registry and comparison with the HERMES metanalysis

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Background and aims: Randomized controlled trials (RCTs) have shown mechanical thrombectomy (MT) a highly effective and safe treatment in experienced centres. We report MT outcomes from the UK national registry in comparison with meta-analysis from the HERMES collaboration.
Methods: Data were extracted from the Sentinel Stroke National Audit Programme (SSNAP) from all 26 UK centres providing MT for patients admitted between 1st April 2016 and 29 June 2022. SSNAP is the nationwide acute stroke registry for England, Wales and Northern Ireland with a case ascertainment of approx. 95%.
Results: 540,682 patients were recorded in SSNAP, of which 8,381 were treated with MT (1.5%). Compared to HERMES, the UK population were older (mean age 68 years (SD 14.7) vs 66 (13.2)) with lower rates of atrial fibrillation (21% vs 33%) and hypertension (47% vs 56%), and similar NIHSS scores at arrival (median 17 [11-21] vs 17 [14-20]), all $p < 0.001$). Despite lower rates of bridging therapy with alteplase (55% vs 83%, $p < 0.001$) and longer times from onset to reperfusion (322 minutes [242-473] vs 285 [210-362]), we observed similar rates of NIHSS 0-2 at 24h (21% vs 21, p=0.96) and mortality at discharge (SSNAP) vs 90-day (HERMES) (16% vs 15%, p=0.48). 80% vs 70.5% ($p < 0.001$) had a modified Thrombolysis in Cerebral Infarction (mTICI) score of 2b or 3.
Conclusions: Despite some differences in the population, efficacy data across the UK were comparable to those reported in the HERMES metanalysis. Real-world implementation of MT is delivering similar efficacy to the definitive RCTs.
Disclosure of interest: Yes

1601

LOCAL IN-HOSPITAL WORKFLOWS IMPACT DRIP-AND-SHIP PATIENT OUTCOMES - A SECONDARY ANALYSIS OF THE RACECAT TRIAL

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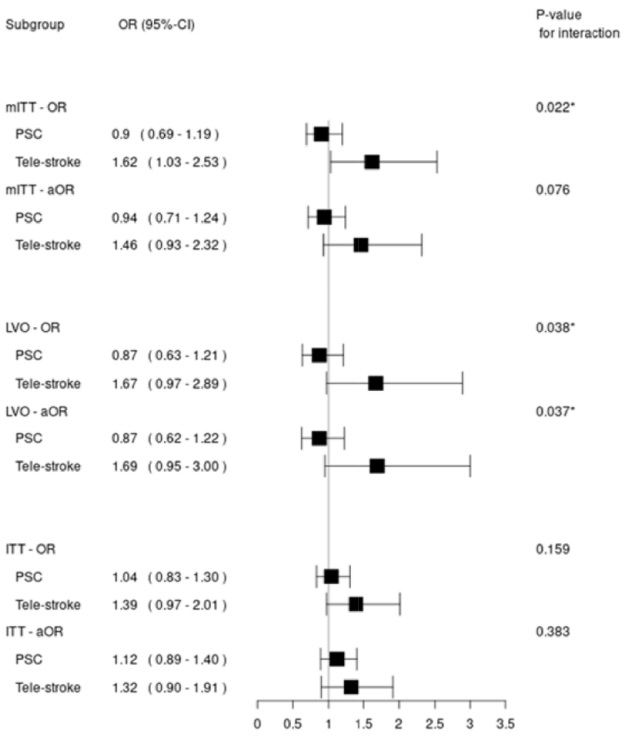
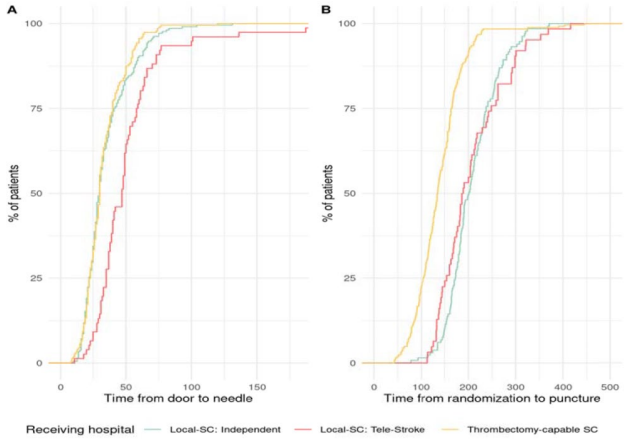
Background and aims: The RACECAT trial did not find differences between initial transfer to a local stroke center (Local-SC) vs a thrombectomy-capable center in patients with suspected acute ischemic stroke (AIS) due to large vessel occlusion (LVO). We aim to compare patient outcomes according to their geographically assigned Local-SC: tele-stroke vs primary stroke centers (PSC).
Methods: Post-hoc secondary analysis of RACECAT trial. Primary outcome was shift in 90-day mRS in AIS patients (mITT in RACECAT) in a multivariate analysis. Secondary outcomes were calculated in LVO and all patients (ITT). We compared treatment rates, time metrics and their impact on outcome.
Results: We included 1367 patients, from geographical regions covered by Tele-Stroke (n=391, 28.6%) or PSC (n=976, 71.4%). Qualifying event was AIS in 903 (66.1%) patients (LVO: 635 [46.5%]). In tele-stroke regions, mothership transfer protocol favored better outcomes in AIS (aOR 1.43[0.93-2.32], p_i=0.076) and LVO populations (aOR 1.69[0.95-3.00], p_i=0.037), whereas no differences were found in the ITT population (p_i=0.383) (figure 1).
Tele-stroke vs. PSC did not differ in iv-thrombolysis (59.7% vs. 62.4%; p=0.592) or EVT rates (65.5% vs. 56.9%; p=0.164). Door-to-needle times were longer in tele-stroke centers (47[35-58] min vs. 30 [22-42] min,



p<0.001) but randomization-to-puncture times were similar (188 [155-247] vs. 201 [173-237]; p=0.366) (figure 2). Door-to-needle time was an independent predictor of outcome in AIS (p=0.037) and LVO (p=0.018).
Conclusions: Longer local in-hospital metrics could impact outcomes of AIS patients, especially in those with LVO. Workflows in Tele-stroke centers should be optimized to achieve better outcomes under drip-and-ship protocols.



Disclosure of interest: No

1763

READMISSIONS DUE TO MAJOR ADVERSE CARDIOVASCULAR EVENTS FOLLOWING SARS-COV-2 IN THE US IN 2020

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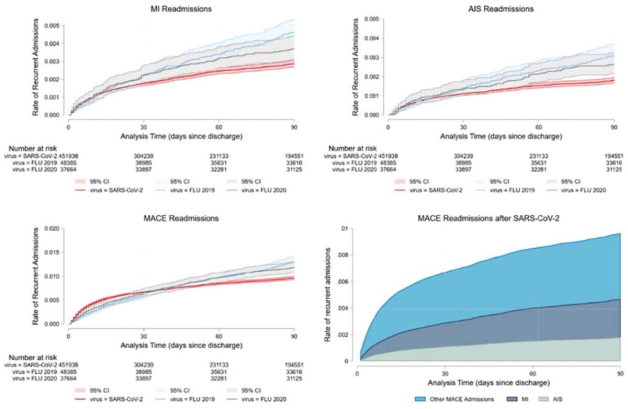
Background and aims: Respiratory infections such as influenza increases risk of acute ischemic stroke (AIS) and myocardial infarction (MI). We examined rates of hospital readmission related to major adverse cardiovascular event (MACE) following SARS-CoV-2 in 2020 in the Nationwide Readmissions Database (NRD).
Methods: Using the 2020 NRD, we identified adults admitted with laboratory confirmation of SARS-CoV-2 as the principal diagnosis. After excluding patients with MACE during their initial admission, we examined rates of 90-day readmissions due to AIS, MI or all MACEs (ICD CM codes in the first 3 positions) following SARS-CoV-2 in comparison to patients discharged with influenza in 2020 and 2019 using logistic regression.
Results: 456,928/517,738 (88.3%) patients with SARS-CoV-2 in 2020, 38,176/38,787 (98.4%) with influenza in 2020 and 49,033/49,676 (98.7%) with influenza in 2019 survived their admission. There were higher rates of AIS (0.14% vs. 0.05%, P<0.001) and MACE (3.67 vs. 1.78, p<0.001) during SARS-CoV-2 admissions but no significant differences in MI (0.78% vs. 0.75%, p=0.287). Figure 1 shows rates of readmissions related to MI, AIS and MACE events following SARS-CoV-2 vs. influenza. After adjusting for age, sex, income, insurance, rural vs. urban location, patients discharged alive following SARS-CoV-2 had lower 90-day readmissions for AIS (OR 0.62, 95%CI 0.53-0.73), MI (OR 0.63, 95%CI 0.55-0.72) and MACE (OR 0.78, 95%CI 0.72-0.84).



Conclusions: In the US in 2020, 90-days MACE-related readmissions following SARS-CoV-2 were lower than following influenza.
Disclosure of interest: No

2493

Determinants of stroke recurrence in patients with stroke related atrial fibrillation in a large healthcare-based cohort

Jorge Pagola*[1,1], Giorgio Colangelo[2], David Cano[2], Didier Dominguez[3], Marta Olivé[1], Jesús Juega[1], Claudia Meza[1], Marián Muchada[1], Alvaro Garcia-Tornel[1], Federica Rizzo[1], Noelia Rodriguez-Villatoro[1], David Rodriguez-Luna[1], Marc Ribo[1], Carlos Molina[1], Marta Rubiera[1]
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Background and aims: Stroke patients with Atrial Fibrillation (AF) are at higher risk of stroke recurrence. Anticoagulants (OAC) play an essential role, however other factors may increase the risk of further strokes. We evaluated a cohort of patients with AF and stroke to grade each risk factors of stroke recurrence.
Methods: We performed a retrospective analysis of a population-based dataset of stroke patients from 88 hospitals in Catalonia. Stroke recurrence was deemed as an episode of focal symptoms compatible with stroke beyond 7 days from the index stroke. Cox regression model was employed to ascertain main predictors of stroke recurrence. Sociodemographic data, previous diseases, preventive treatment, lab test and admission to emergency (AER) previously to the index stroke were assessed.
Results: 17082 patients were followed up for a median of 720 days (IQR: 237, 1295 days). 9513 patients received OAC at least once along their follow up (Group A), whereas 7569 patients did not receive OAC during the period (Group B). Group A was associated with a 3.45% absolute risk reduction of recurrent stroke at 2 years (Figure 1). Main variables related to stroke recurrence were similar in both groups: previous AER (Group A HR 0.041) vs. (Group B HR 0.034); lipid disorder (Group A HR 0.031) vs. (Group B HR 0.031) and HBP (Group A HR 0.029) vs. Group B HR 0.031). (Figure 2)
Conclusions: Optimizing stroke secondary prevention in AF patients requires a more comprehensive and intensive vascular risk factor control

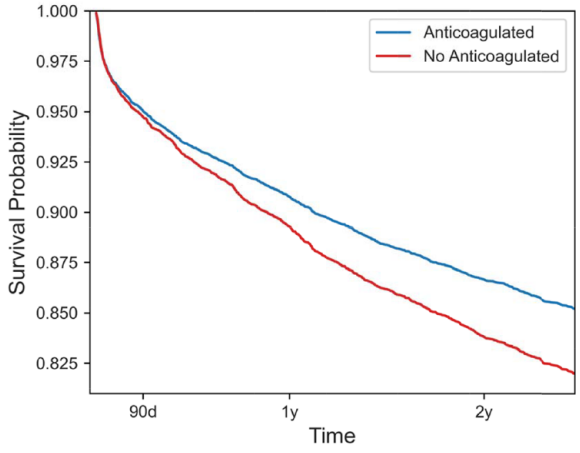

Figure 1.

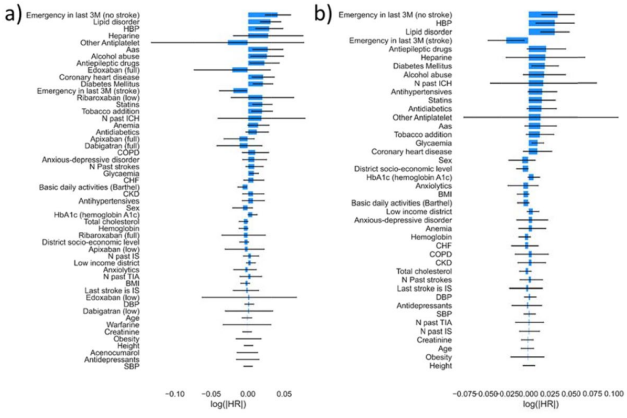

Figure 2.

Disclosure of interest: No

ACUTE MANAGEMENT DAY 2

1159

Emergent carotid stenting for acute ischemic stroke due to tandem occlusion: a meta-analysis

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Background and aims: Optimal management of tandem occlusions is still controversial. In particular, the impact of hyperacute stenting is still unclear, with hemorrhagic risk tied to antiplatelets administered to guarantee stent patency still to be defined. Here we provide a systematic review and meta-analysis to define safety and efficacy of emergent carotid stenting for tandem occlusions.

Methods: Protocol was registered with PROSPERO (CRD42021279218). MEDLINE, EMBASE and Scopus were searched from 1/1/04 to 1/10/21 for studies comparing eCAS vs no-stenting approach in cases of stroke due to tandem occlusion. Primary outcome was good functional outcome (90 days mRS 0-2); secondary outcomes were sICH, recurrent stroke, successful recanalization (TICI 2B-3), and embolization in new territories. Meta-analysis was performed using the Mantel-Haenszel method and random-effect modeling

Results: Data from 38 studies were pooled. eCAS was associated with higher rates of good functional outcome vs no-stenting (OR=1.14, 95%CI 1.14-1.91). eCAS carried a marginal increase in sICH risk (OR=2.14, 95%CI 0.93-4.89), and a higher chance of successful recanalization (OR=2.38, 95%CI 1.55-3.67).

Conclusions: eCAS carries a higher rate of good functional outcome compared to no-stenting approach in patients with acute ischemic stroke due to tandem occlusion, with a marginal increase in sICH risk.

Disclosure of interest: No

1188

ASSOCIATION BETWEEN BLOOD PRESSURE VARIABILITY AND OUTCOMES AFTER ENDOVASCULAR THROMBECTOMY FOR ACUTE ISCHEMIC STROKE: AN INDIVIDUAL PATIENT DATA META-ANALYSIS

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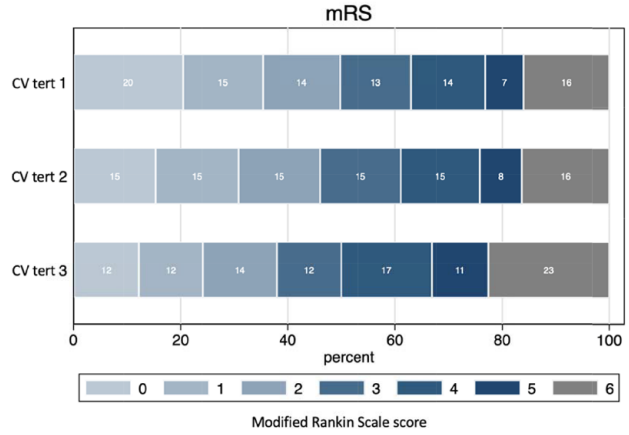
Background and aims: Data on the association between blood pressure variability (BPV) after endovascular thrombectomy (EVT) for acute ischemic stroke (AIS) and outcomes are limited. We sought to identify whether BPV was associated with key outcomes after EVT for AIS.

Methods: We combined individual patient-level data from 5 studies of patients with AIS who underwent EVT and provided individual BP measurements after the end of the procedure. BPV was estimated as either

systolic blood pressure (SBP) standard deviation (SD) or coefficient of variation (CV) over 24 hours post-EVT. We used a logistic mixed-effects model to estimate the association between tertiles of BPV and outcomes of 90-day disability (modified Rankin Score>2), and 90-day mortality, symptomatic intracranial hemorrhage (SICH), adjusting for age, sex, stroke severity, co-morbidities, TICI 2b or higher recanalization, and mean SBP.

Results: There were 4,106 total patients with AIS included in the analysis. After adjustment, the highest tertile of SBP SD was associated with higher 3-month disability (OR=1.40, 95%CI: 1.13-1.73), but not 3-month mortality (OR=1.14, 95%CI: 0.97-1.61) or SICH (OR=1.19, 95%CI: 0.76-1.86). The highest tertile of CV was associated with higher 3-month disability (OR=1.36, 95%CI: 1.10-1.67; Figure), and mortality (OR=1.35, 95%CI: 1.06-1.74), but not SICH (OR=1.15, 95%CI: 0.75-1.77).

Conclusions: BPV after EVT appears to be associated with worse outcomes, independently of mean blood pressure levels. BPV in the first 24 hours may be a novel target to improve outcomes after EVT for AIS.



Disclosure of interest: No

1309

Lipoprotein(a) and Efficacy of Intravenous Thrombolysis in Acute Ischemic Stroke – Effect Modification Analysis

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Background and aims: Lipoprotein(a) [Lp(a)] inhibits fibrinolysis *in vitro*. Intravenous thrombolysis (IVT) with rtPA improves outcomes in patients with acute ischemic stroke (AIS) by promoting fibrinolysis. We investigated whether serum Lp(a) modifies the effect of rtPA on functional outcome in patients with AIS.

Methods: We used data from 2 independent prospective multicenter cohort-studies (CoRisk, BIOSIGNAL), in which Lp(a) was measured within 24 hours after AIS onset. The effect of IVT on the primary outcome (poor functional outcome at 90 days [mRS of 3-6]) was examined using logistic regression. We examined the impact of Lp(a) on the effect of IVT on functional outcome with interaction analyses.

Results: Of 2,472 patients, 796 (32.2%) received IVT (Table 1). Patients treated with IVT were clinically more severely affected than those not treated with IVT (admission NIHSS [median]: 8 vs. 4, p=<0.001). Lp(a) levels were comparable between both groups, as was the proportion of those pre-treated with lipid-lowering drugs. The beneficial effect of IVT on 90-day functional outcome was confirmed (aOR: 0.71, 95%CI 0.53-0.94, p=0.02; Table 2). Interaction analysis showed that the beneficial effect of IVT was significantly attenuated with increasing Lp(a) levels ($p_{interaction}$=0.002). After adjustment for confounders, no significant effect modification of IVT by Lp(a) was detected (Figure 1).

Conclusions: Increasing Lp(a) levels were associated with an attenuated beneficial effect of IVT. After adjustment for confounders, effect modification of Lp(a) was not statistically significant. Our findings do not suggest a clinically meaningful reduction of the favourable effect of IVT through Lp(a).

Figure 1. Predictive margins of logLp(a) stratified by treatment with intravenous thrombolysis. A: Model with interaction term (IVT:logLp(a)) alone; B: Model with interaction term and additional adjustment for all covariables described in the literature as outcome-influential.

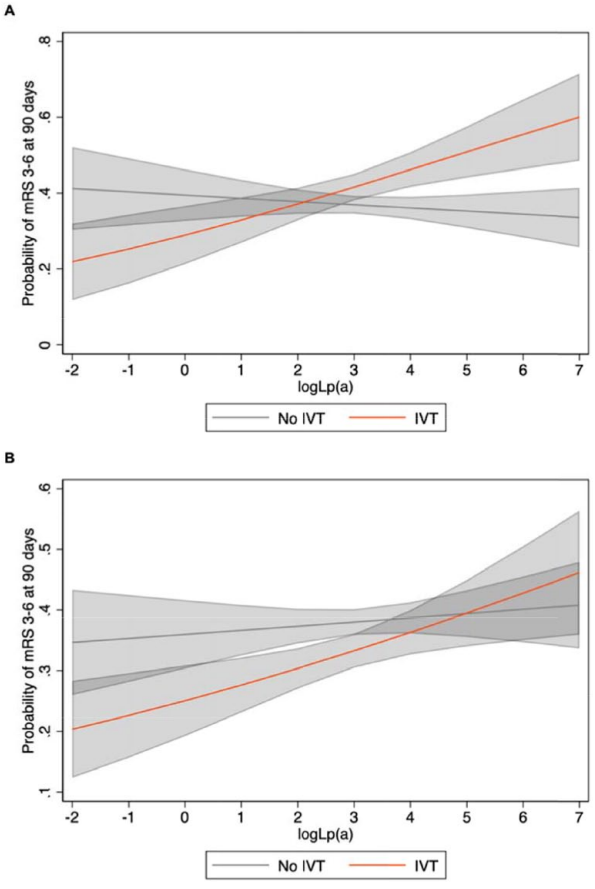

Table 1. Baseline characteristics

	Total (N=2,472)	IVT (N=796)	No IVT (N=1,676)	P value	Missings (%)
Demographics					
Age (yr) – median [IQR]	73.5 (62.5-81.6)	72.9 (62.4-81.1)	73.8 (62.6-82.0)	0.20	0 (0)
Female sex – no. (%)	999 (40.4)	333 (41.8)	666 (39.7)	0.32	0 (0)
Medical history – no. (%)					
Arterial hypertension	1,766 (71.4)	550 (69.1)	1,216 (72.6)	0.08	0 (0)
Dyslipidemia	1,602 (65.1)	526 (66.4)	1,076 (64.4)	0.34	10 (0.4)
Diabetes mellitus	405 (16.4)	116 (14.6)	289 (17.3)	0.09	1 (<0.1)
Smoking	629 (25.6)	173 (21.9)	456 (27.4)	**0.004**	18 (0.7)
Previous stroke	414 (16.8)	99 (12.4)	315 (18.8)	**<0.001**	1 (<0.1)
Coronary artery disease	479 (19.4)	159 (20.0)	320 (19.1)	0.58	2 (0.1)
Atrial fibrillation	581 (23.6)	173 (21.8)	408 (24.5)	0.14	13 (0.5)
Clinical characteristics – median [IQR]					
NIHSS score on admission	5 (2-12)	8 (4-15)	4 (2-9)	**<0.001**	6 (0.2)
Premorbid mRS score	0 (0-1)	0 (0-0)	0 (0-1)	**<0.001**	8 (0.3)
Time from symptom onset to admission, min	179 (87-388)	120 (67-211)	225 (105-535)	**<0.001**	270 (10.9)
TOAST etiology					
Large artery atherosclerosis	359 (14.5)	121 (15.2)	238 (14.2)	0.51	1 (<0.1)
Cardiac embolism	862 (34.9)	279 (35.1)	583 (34.8)	0.91	1 (<0.1)
Small vessel disease	226 (9.1)	38 (4.8)	188 (11.2)	**<0.001**	1 (<0.1)
Other determined etiology	118 (4.8)	41 (5.2)	77 (4.6)	0.55	1 (<0.1)
Unknown	907 (36.7)	317 (39.8)	590 (35.2)	**0.03**	1 (<0.1)
Medication on admission – no. (%)					
Antilipid drugs	736 (29.8)	229 (28.8)	507 (30.3)	0.45	3 (0.1)
Antihypertensive drugs	1,467 (59.4)	449 (56.5)	1,018 (60.8)	0.04	3 (0.1)
Oral anticoagulants	306 (12.4)	45 (5.7)	261 (15.6)	**<0.001**	2 (0.1)
Platelet inhibitors	928 (37.6)	299 (37.6)	629 (37.6)	1.00	1 (<0.1)
Laboratory parameters – median [IQR]					
LDL cholesterol, mmol/L	2.7 (2.0-3.4)	2.6 (2.0-3.3)	2.7 (2.0-3.4)	0.29	130 (5.3)
Lipoprotein(a), nmol/L	16.6 (7.0-56.0)	16.0 (7.0-46.0)	17.0 (7.0-62.0)	0.37	25 (1.0)
HDL cholesterol, mmol/L	1.3 (1.0-1.6)	1.3 (1.1-1.6)	1.3 (1.0-1.6)	0.32	84 (3.4)
Treatment characteristics – no. (%)					
IAT	241 (9.7)	135 (17.0)	106 (6.3)	**<0.001**	1 (<0.1)
MT	483 (19.5)	210 (26.4)	273 (16.3)	**<0.001**	4 (0.2)

IVT: intravenous thrombolysis; MT: mechanical treatment; IAT: intraaterial thrombolysis

Table 2. Multivariable binary logistic regression analysis

Association of IVT on functional outcomes at 90 days*			
	aOR	95%CI	P value
mRS 3-6 at 90 days (IVT vs. no IVT)	0.71	0.53-0.94	**0.02**

IVT: intravenous thrombolysis; MT: mechanical treatment; IAT: intraaterial thrombolysis

Adjusted odds ratios (aOR) are reported. We state 95% confidence intervals (CI). Cases with missing data for one or more covariable (N=10) were excluded from the analyses.

* We adjusted for following covariables: IVT, logLp(a), MT, age, hypertension, diabetes, atrial fibrillation, admission NIHSS score, premorbid mRS, admission blood glucose, onset-to-admission-time, blood pressure on admission, occlusion site, TOAST etiology.

Table 3. Statistical significance of the interaction term IVTxLp(a) on functional outcome at 90 days

Univariable interaction analysis			
	aOR	95%CI	P value
mRS 3-6 at 90 days			
IVT : logLp(a)	1.25	1.08-1.44	**0.002**

Multivariable interaction analyses*			
	aOR	95%CI	P value
mRS 3-6 at 90 days (IVT : logLp(a))			
Model 1:	1.17	0.95-1.44	0.14
Model 2:	1.20	0.98-1.47	0.08
Model 3:	1.18	0.95-1.45	0.13

IVT: intravenous thrombolysis; MT: mechanical treatment; IAT: intraaterial thrombolysis

Adjusted odds ratios (aOR) are reported. We state 95% confidence intervals (CI). Cases with missing data for one or more covariable (N=10) were excluded from the analyses.

* Multivariable models were additionally adjusted for: covariables with significant (i.e., p<0.05) outcome association in univariable analyses [i.e. model 1: MT, IAT, age, sex, previous stroke, hypertension, diabetes, smoking, atrial fibrillation, coronary artery disease, recurrent stroke within 90-day follow-up, NIHSS score on admission, premorbid mRS score, Charlson comorbidity index, blood glucose on admission, diastolic blood pressure on admission, onset-to-admission time, occlusion site, TOAST etiology]; covariables that were described in the literature as outcome-influential [i.e. model 2: MT, age, hypertension, diabetes, atrial fibrillation, NIHSS on admission, premorbid mRS score, blood glucose on admission, onset-to-admission time, systolic and diastolic blood pressure on admission, occlusion site, TOAST etiology]; all covariables from model 1 and 2 [model 3: MT, IAT, age, sex, previous stroke, hypertension, diabetes, smoking, atrial fibrillation, coronary artery disease, NIHSS score on admission, premorbid mRS score, Charlson comorbidity index, blood glucose on admission, recurrent stroke within 90-day follow-up, onset-to-admission time, systolic and diastolic blood pressure on admission, occlusion site, TOAST etiology]

Disclosure of interest: No

1384

Bridging thrombolysis versus mechanical thrombectomy alone in stroke subtypes with large vessel occlusions: a post-hoc analysis of the SWIFT DIRECT trial

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Background and aims: We hypothesized, that there is no treatment effect heterogeneity of intravenous alteplase (IVT) plus mechanical thrombectomy (MT) compared to MT alone in different stroke subtypes of patients with large vessel occlusions.

Methods: We analyzed data from the SWIFT-DIRECT trial ClinicalTrials.gov.Identifier:NCT03192332). The effect of allocation to IVT+MT vs. MT alone by stroke aetiology (intra-/extracranial large artery atherosclerosis, cardioembolism, others) was analyzed in regression models. In the primary analysis, cardioembolism was included in the other aetiology group, in the secondary analysis, all three groups were analyzed individually. The primary outcome was functional independence (mRS 0-2) at 90 days. Secondary outcomes included mortality, successful recanalization (cs-TICI 2bc-3), first pass recanalization (cs-TICI 2c-3), and any intracranial haemorrhage at 24 hours.

Results: We included 408 patients, 68/16.7% with large artery atherosclerosis, 155/38.0% with cardioembolism and 185/45.3% with other aetiology. Overall, there was no significant interaction between stroke subtypes and treatment assignment regarding successful post-MT recanalization, functional outcome and any intracranial haemorrhage. Other aetiology modified the effect of MT+IVT on successful first pass recanalization in the primary (aOR 4.61,95%CI:1.51-14.1) and secondary (aOR 5.50,95%CI:1.67-18.2) analysis, respectively. Other aetiology tended to increase the odds for mortality at 90 days in the primary (aOR 3.15,95%CI:0.99-10.1) and secondary analysis (aOR 4.77,95% CI:1.45-15.72).

Conclusions: We found no significant interaction between stroke subtypes and treatment assignment. Considering its low power, clinically important effects could have been missed. Treatment effect heterogeneity of IVT+MT vs. MT alone according to stroke subtypes should be further analyzed in individual patient meta-analysis of comparable trials.

Disclosure of interest: No

1517

TIROFIBAN VS ASPIRIN PREVENTING ACUTE IN-STENT THROMBOSIS: ANTIPLATELET THERAPY DURING MECHANICAL THROMBECTOMY IN ACUTE ISCHEMIC STROKE DUE TO ATHEROSCLEROTIC EXTRACRANIAL CAROTID LESION

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Background and aims: In-stent thrombosis within the first 24 hours after acute carotid artery stenting (CAS) during mechanical thrombectomy (MT) is associated with worse prognosis. The optimal antiplatelet strategy to maintain the stent patency is yet to be elucidated. We investigated the efficacy of intravenous tirofiban against intravenous aspirin in patients undergoing acute CAS.

Methods: We conducted a retrospective single-center analysis of patients with AIS secondary to atherosclerotic carotid artery severe stenosis or occlusion treated by MT with acute CAS between 2017 and 2022. Patients were analyzed according to first-line antiplatelet drug received (intravenous aspirin vs intravenous tirofiban). Primary efficacy outcome was in-stent thrombosis rate within 24 hours assessed by carotid ultrasound and primary safety outcome was rate of symptomatic intracranial hemorrhage (SICH).

Results: Of 236 patients analyzed, 196 received intravenous-aspirin and 40 intravenous-tirofiban. The median of age was 68 (IQ=60-77) and median NIHSS was 18 (IQ-12-24). Tirofiban group had higher ASPECTS score [9(IQ=8-10) vs 8(IQ=7-10),p=0.01]. Tandem lesions (concomitant terminal ICA, M1, M2 occlusion) was observed in 70% in tirofiban group and 84.1% in aspirin group (p=0.19). The in-stent thrombosis rate was lower with iv-tirofiban [0% vs 7.1%, (IC95%=3.5-10.7),p$<$0.001], with similar rates of SICH (5% vs 10.2%)[OR=0.29(IC95%=0.04-2.27),p=0.24]. Good functional outcome (mRS$\leqslant$2) was similar (50% vs 57.4%) [OR=1.12(IC95%=0.47-2.67),p=0.8].

Conclusions: In our cohort, the proportion of in-stent thrombosis was significantly lower in patients treated with tirofiban as first line antiplatelet therapy, with similar rates of SICH and functional outcome. Prospective randomized clinical trials are needed to confirm our result.

Disclosure of interest: No

1589

ENDOVASCULAR THROMBECTOMY IN PATIENTS PRESENTING WITH LARGE VESSEL OCCLUSION VERY LATE FROM TIME LAST SEEN WELL: A POOLED ANALYSIS OF NINE STUDIES

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Background and aims: It is unclear if endovascular thrombectomy (EVT) is safe and effective in patients presenting with large vessel occlusions (LVOs) very late from time last seen well (LSW). We aimed to build solid evidence by pooling the available published data.

Methods: We searched relevant electronic databases from EVT inception to January 2023. Data was then extracted from relevant studies and single arm meta-analysis was conducted for EVT $>$16 and $>$24 hours.

Results: Nine studies were included with 496 patients undergoing very late EVT. For patients undergoing EVT$>$16 hours from LSW, pooled analysis showed that 163 out of 496 achieved functional independence (modified Rankin Scale (mRS) score, 0–2: 0.381[95% CI, 0.267–0.446]) at 90 days. Symptomatic intracranial hemorrhage (sICH) was recorded in 36 out of 476 (0.064 [95% CI, 0.042–0.085]) while mortality was recorded in 116 out of 476 (0.229 [95% CI, 0.157–0.300]) at 90 days. For patients undergoing EVT$>$24 hours, pooled analysis showed that 143 out of 454 achieved functional independence (mRS score, 0–2: 0.331[95% CI, 0.238–0.425]) at 90 days. Similarly, sICH was recorded in 33 out of 432 (0.065 [95% CI, 0.042–0.088]) while mortality was recorded in 110 out of 454 (0.222 [95% CI, 0.149–0.295]) at 90 days.

Conclusions: EVT appears to be effective for patients presenting with LVOs very late either $>$16 or $>$24 hours from LSW. Notably, the sICH rates were numerically higher than in earlier time window. Further prospective comparative studies are needed to confirm these results.

Disclosure of interest: No

1609

ENDOVASCULAR TREATMENT IN ACUTE LARGE VESSEL OCCLUSION DUE TO INTRACRANIAL ATHEROSCLEROSIS

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Background and aims: We wanted to evaluate the percentage of acute thrombectomies due to intracranial atherosclerosis (ICA) in our setting and the clinical, procedural, and prognostic variables in those patients, compared to other etiologies

Methods: Prospective registry of patients treated with endovascular therapy in the acute phase in NORDICTUS registry (Spain), from 1/1/18 to 5/1/22. Baseline, procedural, and prognostic variables were compared between the following etiological groups: ICA, extracranial atherosclerosis (ECA), and other etiologies (OE).

Results: We included 4574 patients treated with thrombectomy: 225 ICA, 531 ECA and 3818 OE. Patients with atherothrombotic etiology (ICA and ECA) were significantly younger and more frequently male, with more smoking, alcohol consumption, diabetes and dyslipidemia compared to OE. In ICA, baseline NIHSS was significantly lower and basal glycaemia and triglycerides were higher than in other groups. Posterior stroke and absence of hyperdense vessel sign was more frequent in ICA. The use of

general anesthesia, number of passes and procedure time were higher in ICA, with lower final TICI 2b/3. Stent was implanted in the acute phase in 18.4% of ICA and in 52.3% of ECA.There were no differences in in-hospital mortality or symptomatic intracranial hemorrhage. In multivariate analysis ICAS was an independent predictor of functional outcome at 3m, OR 0.58 [0.40-0.85]

Conclusions: In 4.8% of thrombectomies, occlusion was due to ICA and was associated with a greater complexity of the endovascular procedure and worse functional outcome at three months

Disclosure of interest: No

2087

EARLY RECANALIZATION AMONG PATIENTS UNDERGOING BRIDGING THERAPY WITH TENECTEPLASE OR ALTEPLASE : A PROPENSITY MATCHED ANALYSIS

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Background and aims: Intravenous alteplase or tenecteplase prior to thrombectomy is the recommended treatment for ischemic stroke with large-vessel occlusion (LVOS). Data are discordant on whether these thrombolytics differ in terms of early recanalization (ER) before thrombectomy, and the potential influence of ER predictors such as time elapsed between IVT and ER evaluation (IVT-to-ER_{eval}), occlusion site and thrombus length.

Methods: We compared ER rates after IVT with tenecteplase or alteplase in anterior circulation LVOS patients in propensity scores matched and weighted analyses from the PREDICT-RECANAL (alteplase) and TETRIS (tenecteplase) French multicenter registries.

ER was defined as a modified thrombolysis in cerebral infarction (mTICI) score 2b-3 on the first angiographic run, or an arterial occlusive lesion (AOL) score 3 on computed tomography angiogram.

Results: Among 1865 patients, 1086 were matched (mean age 70 years, median NIHSS score 16, median onset-to-IVT and IVT-to-ER_{eval} times: 144 and 87 minutes). ER incidence was 18.6% after tenecteplase and 18.1% after alteplase (aOR 1.04; 95%CI 0.76–1.42; p=0.81). There was no interaction between thrombolytic and ER rates according to IVT-to-ER_{eval} time ($p_{interaction}$=0.64), occlusion site ($p_{interaction}$ =0.57) and susceptibility–vessel sign length ($p_{interaction}$ =0.15). In a propensity-weighted analysis among patients with IVT-to-ER_{eval} time ⩽ 30 minutes (n=144), ER rates were 22.0% after tenecteplase and 5.3% after alteplase (aOR 4.68; 1.93-11.34; $p<0.001$).

Conclusions: Both thrombolytics achieved ER in a fifth of LVOS patients, with no interaction found among known predictors of ER. However, ER was four times more likely with tenecteplase, when evaluated within 30 minutes after IVT.

Disclosure of interest: Yes

2325

ONGOING INTRAVENOUS THROMBOLYSIS AT FLOW RESTORATION IMPROVES BOTH CLINICAL AND ANGIOGRAPHIC OUTCOME IN ACUTE ISCHEMIC STROKE PATIENTS: AN ANALYSIS OF THE GERMAN STROKE REGISTRY-ENDOVASCULAR TREATMENT (GSR-ET)

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Background and aims: We hypothesized, that in acute ischemic stroke patients treated with endovascular therapy (ET), ongoing intravenous thrombolysis (IVT) at flow restoration (FLR) is associated with both improved functional and angiographic outcome and has beneficial impact on ET-related technical parameters.

Methods: Patients from the GSR-ET, registered between 06/2015 and 12/2021 were analyzed. Primary outcomes were good clinical outcome (mRS 0-2 or back to base line after three months) and good angiographic outcome (modified Thrombolysis In Cerebral Infarction [mTICI] score of 2b-3). Secondary parameters were ET duration, periinterventional complications and first pass thrombectomy. Baseline characteristics of patients with and without ongoing IVT at FLR were compared in univariate analysis. Associations of ongoing IVT at FLR with outcome parameters were determined using multivariate logistic regression models.

Results: Out of 2028 patients considered for analysis 349 (12.3%) had ongoing IVT at FLR, while 2479 (87.7%) did not. Ongoing IVT at FLR was associated with good clinical outcome (Odds ratio [OR] 1.50; 95% Confidence interval [CI] 1.07-2.11; $p<0.05$) and good angiographic outcome (OR 2.70; 95%CI 1.08-6.75; $p<0.05$), when adjusted for time intervals. Ongoing IVT at FLR predicted for reduced ET duration (ß=-24.97; 95%CI -35.19-(-14.75); $p<0.05$), first pass thrombectomy (OR 2.00; 95%CI 1.49-2.70; $p<0.05$) and less periinterventional complications (OR 0.62; 95%CI 0.42-0.92; $p<0.05$).

Conclusions: Our results suggest a beneficial impact of ongoing IVT at FLR on both functional and angiographic outcome in anterior circulation LVO stroke patients. Furthermore, ongoing IVT may ease first pass thrombectomy, speed up ET and reduce periinterventional complications.

Disclosure of interest: No

2379

Flow reduction model during EVT in a collateral flow model

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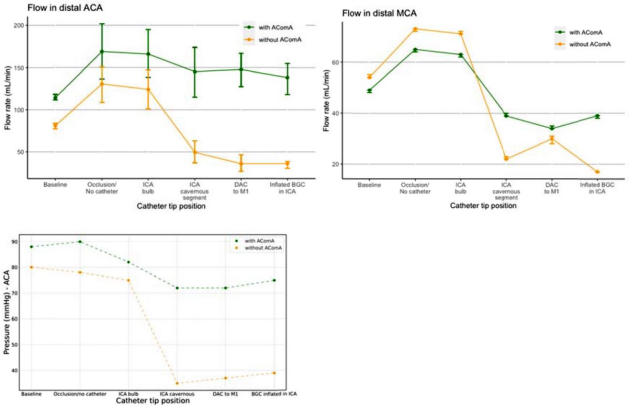
Background and aims: During EVT, the balance in the collateral supply can be altered by the presence of catheters. We aimed to study the impact of catheter positioning on flow diversion during EVT.

Methods: We quantified the flow diversion effect secondary to arterial occlusions in an in vitro model which was connected in a flow-loop setup with a saline reservoir and a pump supplying pulsatile flow. Clot analogs were embolized to the MCA-M1 or M2. The same model with a clamped AComA was used to simulate poor collaterals scenario.
A pressure transducer was introduced in the distal ACA and an ultrasound flow sensor was placed at the vessel of interest. Flow rates and pressures were evaluated according to catheter location: baseline (1) before and (2) after the occlusion; (3) 8F guiding catheter at the ICA bulb; (4) at the cavernous segment; (5) at the cavernous segment and 0.071'' distal access catheter at proximal M1; (6) 8F balloon guide catheter inflated.
Results: Collateral blood flow measured at distal ACA (M1-MCA occlusion, figure 1) and M2-MCA (M2-MCA occlusion figure 2) was progressively reduced as catheters were advanced through the ICA and MCA. In the lacking AComA model, the flow was further diminished as compared with the model with a patent AComA. Likewise, systolic pressure significantly dropped in the lacking AComA model (figure 3).
Conclusions: Navigation of catheters can alter the balance in collateral supply and potentially leading to clinical worsening. The effect is significantly magnified in the absence of a patent AComA.



Disclosure of interest: No

2651

Endovascular thrombectomy with or without thrombolysis for stroke: A systematic review and meta-analysis of RCTs

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Background and aims: We aimed to systematically update the evidence from randomized trials comparing endovascular thrombectomy (EVT) alone versus EVT with bridging intravenous thrombolysis (IVT).
Methods: We searched MEDLINE, EMBASE, and the Cochrane Library to identify randomized controlled trials (RCTs) comparing EVT with or without IVT in patients presenting with stroke secondary to a large vessel occlusion. We conducted meta-analyses using random-effects models to compare functional independence, mortality, and symptomatic intracranial hemorrhage (sICH), between EVT and EVT with IVT. We assessed risk of bias using the Cochrane risk-of-bias tool and certainty of evidence for each outcome using the GRADE approach.
Results: Of 11,111 citations, we included 6 studies with a total of 2,336 participants. We found low-certainty evidence that there is possibly a small decrease in the proportion of patients with functional independence (risk difference [RD] -2.0%, 95% CI -5.9% to 2.0%), low-certainty evidence that there is possibly a small increase in mortality (RD 1.0%, 95% CI -2.2% to 4.7%), and moderate-certainty evidence that there is probably a decrease in sICH (RD -1.0%, 95% CI -1.6% to 0.7%) for patients with EVT alone compared to EVT plus IVT, respectively.
Conclusions: Low-certainty evidence shows that there is possibly a small decrease in functional independence, low-certainty evidence shows that there is possibly a small decrease in mortality, and moderate-certainty evidence that there is probably a decrease in sICH for patients with EVT alone compared to EVT plus IVT.
Disclosure of interest: No

HEMORRHAGE AND THROMBOSIS DAY 2

1586

MULTICENTRIC STUDY FOR CRITICAL CEREBRAL VENOUS THROMBOSIS PREDICTION: VENTISCA SCORE

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Background and aims: Critical cerebral venous thrombosis (C-CVT) poses an extreme clinic situation. Our objective is to determine its clinicoradiological risk profile and to validate the utility of a score we developed in a previous pilot study to predict its evolution, VENTISCA (**VE**nous si**N**us **T**hrombosis mult**I**modal ri**S**k S**CA**le).
Methods: Observational retrospective study with prospective data collection from CVT cases between January 2008 and June 2022 in 4 stroke units in Madrid, Spain. Data regarding clinicoradiological profile and evolution were collected. We defined C-CVT as CVT requiring orotracheal intubation (OTI) or endovascular treatment (EVT), or associating inpatient mortality or functional dependency with mRs>2 at three months. 10 points were assigned based on GCS and NIHSS scores on arrival, existence of encephalopathy, status epilepticus, cerebral edema and haemorrhagic infarct.
Results: N=141 CVT. Mean age 52,21 years(SD 20,06), 52,5% women. GCS 15(14-15), NIHSS 1(0-4), encephalopathy 27%, status epilepticus 9,2%, edema 39%, haemorrhagic infarct 37,6%. 17% required OTI, 9,9% ETV. Inpatient mortality 5,7%, 22% mRS>2 at three months. Criteria for C-CVT met in 28,4%. A VENTISCA score>2 predicted C-CVT with OR 15,94(6,53-38,93) ($p<0,001$) and AUC 0,8(0,71-0,88) ($p<0,001$), and independently predicted functional dependency and OTI and ETV requirement ($p<0,001$). No independent association was found regarding mortality due to low mortality found. A moderate lineal correlation was found between VENTISCA and mRS scores ($r_s=0,49$, $p<0,001$).
Conclusions: Our clinicoradiological VENTISCA score seems to be a promising prognostic tool to detect C-CVT, which could aid early clinical

decision-making. Future prospective studies will assess its applicability in real-life situations.
Disclosure of interest: No

1594

MULTITRAIT ANALYSIS OF INTRACEREBRAL HEMORRHAGE IDENTIFIES NOVEL RISK LOCI

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Background and aims: GWAS have only found two loci associated with intracerebral hemorrhage (ICH): *APOE* for lobar and 1q22 for non-lobar ICH. We wanted to discover new genes/molecules associated with ICH using a Multi-Trait Analysis of GWAS (MTAG), gene-based analysis, transcriptome-wide (TWAS) and proteome-wide association study (PWAS) to understand the biological mechanisms of ICH.
Methods: For all ICH (cases=1,543, controls=1,711) and ICH subtypes (lobar and non-lobar ICH) a pairwise MTAG was performed combining ICH with one phenotype related to cardiovascular risk, cerebrovascular disease or Alzheimer's disease. Those MTAG with loci containing GWAS-significant SNPs in genomic regions shared for both traits were included in a new MTAG combining multiple traits. FUMA was used for gene-prioritization and FUSION for TWAS and PWAS. An independent cohort of ICH from UK biobank (700 ICH and 399,717 controls) was used for replication of MTAG, gene-based analysis and TWAS and PWAS.
Results: We performed 22 pairwise MTAGs for each ICH trait. Novel loci were found only for all ICH, combining data of ICH-small vessel stroke, white matter hyperintensities volume, fractional anisotropy, mean diffusivity, and Alzheimer's disease. We could replicate six SNP belonging to 2q33.2 (*ICA1L*), 10q24.33 (*OBFC1*), 13q34 (*COL4A2*) and 19q13.32 (*APOC1, APOE, PVRL2:CTB-129P6.4*); two genes from the gene-based analysis (*SH3PXD2A* and *APOC1*); and *ICA1L* transcript and protein levels in the prefrontal cortex associated with ICH.
Conclusions: We found several genes or molecules associated with ICH, mostly already related to ICH, amyloid angiopathy, or blood pressure, providing potential targets for future studies for modulating ICH risk.
Disclosure of interest: No

1656

Long-term trends in incidence and risk factors for haemorrhagic stroke: South London Stroke Register

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Background and aims: We aimed to estimate time trends in incidence, prior risk factors and premorbid medications and to investigate any demographic difference.
Methods: Population-based longitudinal data from South London Stroke Register(SLSR) from 1995 to 2018 was studied. Haemorrhagic stroke(HS) was classified as intracerebral haemorrhage(ICH) and subarachnoid haemorrhage(SAH). Incidence was calculated as new cases of HS every year divided by the estimated population in the study area. Incidence rates were stratified into age-, sex- and ethnic-groups for the 24-year period and directly standardised using 2011 England and Wales population. We analysed the trend using Cochran-Armitage tests and Poisson regression models.
Results: A total of 1119 with first HS was registered, including 811 ICH and 308 SAH patients. Between 1992-2000 and 2013-2018, the standardised HS incidence decreased by 53% from 41.66 to 19.38/100,000/year (incidence rate ratio[IRR]: 0.47, 95%CI: 0.41-0.53). Declines were observed in ICH(IR:41.66-19.38, $p<0.001$) and SAH(10.29-4.34, $p=0.06$). Reductions were recorded in males and females, younger (<55 years old) and older (>=55 years old) individuals, and white and black ethnic groups, though not significantly in young ICH patients(7.20-4.39, $p=0.30$), female(10.81-5.23, $p=0.10$) and black(10.28-5.20, $p=0.12$) SAH patients. Cholesterol lowering drugs was 8 times increasingly used(OR:8.65, 95%CI: 3.97-18.83, $p<0.0001$) and there was no trend found on hypertension prevalence($p=0.88$).
Conclusions: The incidence rate of HS has been declining since 1995 in all stratified groups, but trend in the most recent 12 years were into a lesser extent. The reported changes in medication use and risk factor are unlikely to fully explain the reduction.
Disclosure of interest: No

1671

CHANGES IN EPIDEMIOLOGY OF PRIMARY INTRACEREBRAL HAEMORRHAGE AND ATRIAL FIBRILLATION, IRISH NATIONAL AUDIT OF STROKE 2013-2021

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Background and aims: Aim: To observe trends in anticoagulation practice and its impact on the incidence of primary intracerebral haemorrhage (PICH) prevalence in Ireland from 2013 to 2021.
Methods: The data was collected from inpatient stroke admissions as part of the Irish National Audit of Stroke from 2013 to 2021. The audit collects data on ischaemic stroke and PICH but does not routinely collect subarachnoid hemorrhage data.
Results: We identified 34,630 patients with a stroke diagnosis, 4,656 (13.4%) of which were PICH. Of these, 957 (20.6%) were found to be in atrial fibrillation (AF) and 744 of these (90.5%) were prescribed antithrombotics at presentation. The ratio of Ischaemic stroke to PICH dropped from 8.7 in 2013 to 6.1 in 2021. (ChSq 23.4 $p<0.0001$).
Prevalence of AF on presentation in PICH reduced from 21.6% of haemorrhagic in 2013 to 20.2% in 2021, a relative reduction of 6.5%. (ChSq 8.5, p=0.004). The proportion of PICH with AF receiving antithrombotic therapy prior to admission increased from 83.3% to 91% over the study period (ChSq 4.9, p=0.03).
Of all stroke patients with AF on an antithrombotic at admission the proportion on warfarin declined from 46.0% to 11.2 % over the period, whereas the proportion on a DOAC increased from 9.4% to 80.0%.
Conclusions: The proportion of PICHs compared to ischaemic stroke increased over the 9 years but the proportion of those with AF related decreased. There has also been a significant shift in anticoagulation choice from warfarin to DOAC.
Disclosure of interest: No

1773

Endothelial targeting as a therapeutic delivery strategy in experimental intracerebral hemorrhage

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Background and aims: Intracerebral hemorrhage (ICH) lacks specific drug therapies. Most trials of novel therapeutics for ICH rely on passive delivery of putative pharmaceuticals given intravenously, and assume that vascular leak through the disrupted blood-brain barrier (BBB) will allow sufficient drug accumulation in the brain for therapeutic effect. Endothelial targeting is a promising delivery strategy for novel therapeutics in ICH, as the endothelium is a gateway for the immune attack on the peri-hemorrhage inflamed brain region.
Methods: We employed a mouse model of experimental ICH, using intrastriatal collagenase injections. At various acute timepoints, we compared vascular leakage and biodistribution of model therapeutics that rely on passive leakage (i.e., untargeted PEGylated nanoparticles) vs. therapeutics that target the endothelium (i.e., anti-VCAM nanoparticles).
Results: Collagenase-induced vascular leak drops significantly by 4 hours after ICH onset and is resolved by 24 hours (Figure 1A), as measured by brain accumulation of radioactive albumin. Concordant with this, brain accumulation of IV-administered untargeted model therapeutics that rely on passive leakage for brain also declined over time after ICH onset. However, the results of passive delivery of untargeted model therapeutics were dwarfed by the 2x-5x higher brain delivery of anti-VCAM therapeutics (Figure 1B).
Conclusions: Relying on passive vascular leak provides inefficient delivery of therapeutics even at early time points after ICH where BBB disruption is maximal. Our data shows that targeted delivery to the brain endothelium using VCAM targeting is an improved strategy for drug delivery in acute ICH.

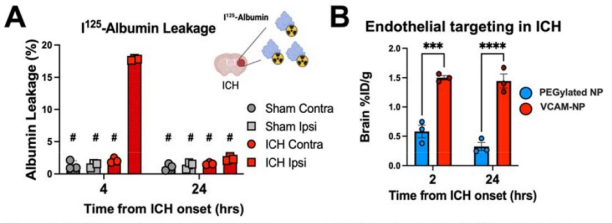

Figure 1. (A) *Vascular Leakage.* We injected sham- and ICH-injured animals with ^{125}I-radiolabeled albumin and measured brain biodistribution in the ipsilateral (ipsi) and contralateral (contra) hemispheres at 4 and 24 hours after ICH. (B) *Endothelial targeting for drug delivery.* We injected animals with untargeted PEGylated nanoparticles (NP) or VCAM-targeted nanoparticles (VCAM-NP) at various times after ICH, and measured brain biodistribution after 30 minutes of circulation. For each experiment, n=3 and mean ± SEM is shown; #p<0.0001; ***p<0.001, ****p<0.0001.

Disclosure of interest: No

1857

Three month outcome after Intracerebral haemorrhage (ICH) of patients with atrial fibrillation (AF) – results from the Registry of Acute Stroke Under Novel Oral Anticoagulants-prime (RASUNOA-prime)

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Background and aims: The Registry of Acute Stroke under Novel Oral Anticoagulants (RASUNOA)-prime was established to describe patterns of emergency management and outcome of patients with non-valvular atrial-fibrillation (AF) experiencing an ICH under different anticoagulation schemes pre stroke (Vitamin K antagonists [VKA], direct oral anticoagulants [DOAC], or no anticoagulation). We report first results of outcomes after 3 months.
Methods: ICH patients with AF and admission <24 h after symptom-onset were enrolled by 46 certified German stroke units in this investigator-initiated observational, multicenter cohort study (ClinicalTrials.gov-NCT02533960). Patients were followed up 3 months after index ICH regarding functional outcomes and recurrent events.
Results: 951 patients were enrolled (26.4% VKA, 60.7% DOAC, 12.9% none). Mortality at 3-months was 41.4%. 43.9% of patients were known to be alive (lost to follow-up or drop out: 14.7%); of these, 54.0% responded to the follow-up questionnaire at three month. Mean age of them was 76.7 years (SD 8.3; male: 61.8%) and poor functional outcome (modified Rankin Scale 4–5) was reported by 37.6%. Re-hospitalizations in these patients occurred in 23.5%; in 4.8% due to recurrent ICH and in 1.7% due to ischemic stroke.
Conclusions: In this large cohort of ICH patients with AF almost half of patients died within the first three months after index ICH and more than one third of survivors remained severely disabled. Further analyses of factors influencing functional outcome are needed.
Disclosure of interest: Yes

1956

CEREBRAL AMYLOID ANGIOPATHY AND RISK OF DEMENTIA IN PATIENTS WITH COGNITIVE COMPLAINT: A PROSPECTIVE COHORT STUDY

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Background and aims: Cerebral Amyloid Angiopathy (CAA) may contribute to dementia in individuals without symptomatic intracerebral haemorrhage. We investigated the frequency of CAA and its association with cognitive outcomes in patients with cognitive complaints.
Methods: Participants were outpatients aged 55 years or older presenting with a cognitive complaint and a Clinical Dementia Rating (CDR) scale score ⩽ 0.5, who were enrolled in the prospective multicentre MEMENTO study. All patients had a brain MRI at baseline, and were followed every 6 months. Based on baseline MRI, participants were classified into the following categories: probable CAA, possible CAA, deep/mixed small vessel disease (SVD) or no SVD. The primary outcome was the progression to dementia (DSM-IV criteria). Cox proportional hazards models were used to compare the risk of incident dementia between the SVD categories.
Results: Of 2052 participants, 144 (7.0%) were classified with probable CAA, 345 (16.8%) with possible CAA, 157 (7.7%) with deep/mixed SVD, and 1406 (68.5%) with no SVD. During a median follow-up of 5.0 years (IQR, 3.1-5.1), 305 participants developed dementia. After adjusting for age, sex, baseline MMSE score and hippocampal volume, patients with probable CAA had an increased risk of dementia (hazard ratio 1.53, 95% CI 1.06-2.21) compared to participants with no SVD. This association was not significant when further adjusted with APOE ε4.

Conclusions: CAA is a common condition in patients with mild cognitive symptoms and is associated with a higher risk of dementia. Potential interactions of APOE with this association require further investigations.
Disclosure of interest: No

2029

BIOLOGICAL AGE ACCELERATION IS LOWER IN WOMEN WITH LOBAR INTRACEREBRAL HEMORRHAGE STROKE COMPARED TO MEN

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Background and aims: Stroke onset in women occurs later in life compared with men. Epigenetic age acceleration (EAA) measures indicate whether an individual is biologically younger or older than expected. Differences in EAA between men and women have been described in ischemic stroke (IS) patients. Here we aim to analyze whether sexual dichotomy at age of onset is conditioned by EAA in spontaneous intracerebral hemorrhage (ICH).
Methods: We analyzed DNA methylation (DNAm) levels from whole blood samples, of 40 lobar-ICH patients (57.7% women) using Infinium EPIC BeadChip. Chronological age (Chrono_Age) described as time from birth, DNA methylation age (DNAm_age) and EAA were calculated using *mehtylClock* R package. We assessed Horvath's, Hannum's Levine's clocks. EAA is calculated based on the difference between DNAm_Age and Chrono_Age and extrinsic-EAA (EEAA) is based on the residuals obtained after regressing chronological age and DNAm_Age adjusted for cell count.
Results: Sex differences in Chrono_Age in lobar-ICH patients were observed (p.value=3.49×10^{-2}), women were over 7 years older than men, mean Chrono_Age men=74±8.5, women=81±8.3, whereas no differences in DNAm_Age were found. Women present lower EAA values across all measures, (Horvath: women=−3.25, men=3.70, P=1.95×10^{-2}; Hannum: women=−16.45, men=-7.88, P=1.84×10^{-3}; Levine: women=−7.54, men=-4.21, P=4.60×10^{-2}). Women also showed lower Hannum EEAA values compared to men (Hannum-EEAA: women=−1.17, men=-0.01, P=2.03×10^{-2}).
Conclusions: Sexual dichotomies of EAA are observed in lobar-ICH patients. Women with lobar-ICH are, in average, biologically younger than their male counterparts.
Disclosure of interest: No

2135

PHASE II CLINICAL TRIAL OF INTERLEUKIN-1 RECEPTOR ANTAGONIST IN INTRACEREBRAL HAEMORRHAGE: RESULTS OF BLOCKING THE CYTOKINE IL-1 IN ICH (BLOC-ICH)

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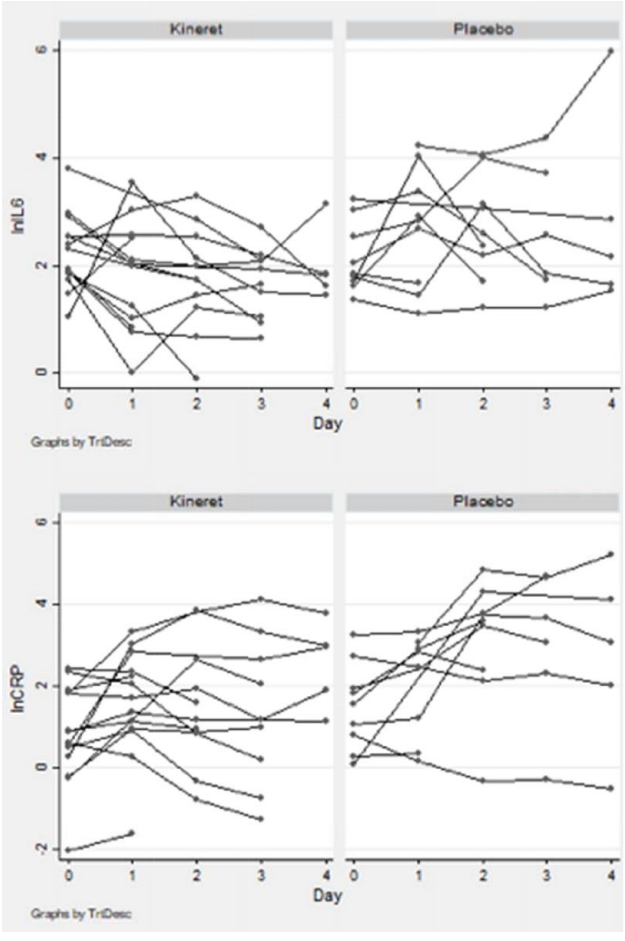
Background and aims: Recombinant human interleukin-1 receptor antagonist (anakinra; Kineret) represents a promising anti-inflammatory in intracerebral haemorrhage (ICH). We sought to test whether anakinra reduces subacute perihaematomal oedema after ICH.
Methods: We conducted a randomised, double-blind, placebo-controlled trial in patients with acute, spontaneous, primary, supratentorial ICH at five UK centres between May 2019 and February 2021. Patients were randomised to 100 mg subcutaneous anakinra within 8h of onset, followed by five, 12-hourly, 100 mg subcutaneous injections, or matched placebo. Primary outcome was oedema extension distance (OED) on 72h CT brain scan. Secondary outcomes included plasma C-reactive protein (CRP) and interleukin-6 (IL-6).
Results: 25 patients (target=80) were recruited. 14 were randomised to anakinra, 11 to placebo. Patients randomised to anakinra had higher median baseline ICH volume (12.6 ml, interquartile range [IQR]: 4.8 to 17.9) vs. placebo (5.5 ml, IQR: 2.1 to 10.9). Adjusting for baseline OED, 72h OED was not significantly different between groups (mean difference OED anakinra vs. placebo -0.11 cm, 95% confidence interval [CI]: -0.74 to 0.51, n=23). Areas under the curve to day 4 for IL-6 (-2.90, 95%CI: -5.90 to 0.12, n=15) and CRP (-0.87, 95%CI: -7.72 to 5.99, n=15) were not significantly lower with anakinra vs. placebo. There were 10 serious adverse events with anakinra and 2 with placebo, none attributed to anakinra.



Conclusions: We demonstrate feasibility for delivering anakinra in acute ICH and provide preliminary safety data. Due to the impact of the COVID-19 pandemic, we had insufficient power to test for significant effects on oedema.

Disclosure of interest: No

2173

NEUROINFLAMMATION AND BLOOD-BRAIN BARRIER BREAKDOWN IN ACUTE, CLINICAL INTRACEREBRAL HAEMORRHAGE: RESULTS OF A MULTIMODALITY MR AND [11C](R)-PK11195 PET STUDY

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Background and aims: Inflammation is a promising target in Intracerebral haemorrhage (ICH). We used multimodal imaging in acute ICH patients to investigate neuroinflammation, blood-brain barrier (BBB) permeability, and test for associations with clinical outcomes.

Methods: Thirty-six acute, spontaneous, supratentorial ICH patients underwent multiparametric MR (including dynamic contrast enhanced [DCE]-MRI), 1-3 days post-onset. Of these, 16 underwent [^{11}C](*R*)-PK11195-PET 2-7 days post-onset. [^{11}C](*R*)-PK11195 binds translocator protein 18kDa (TSPO), expressed on activated microglia/macrophages. Plasma C-reactive protein (CRP) and interleukin-6 (IL-6) were measured at each scan. Maps of BBB transfer constant (K^{trans}) and [^{11}C](*R*)-PK11195 binding potential (BP_{ND}) were co-registered with anatomical imaging. The perihaematomal oedema (PHO) region and contralateral control regions were defined and median K^{trans} and BP_{ND} values extracted.

Results: Imaging/maps from three representative patients are shown (Fig1). PHO K^{trans} (0.86 x 10^{-3} min^{-1} vs. 0.47 x 10^{-3} min^{-1};$p<0.0001$) and BP_{ND} (0.14 vs. 0.02;p=0.006) were significantly elevated vs. contralateral. K^{trans} and BP_{ND} were not correlated with age, time since onset, hematoma volume, oedema extension distance, CRP or IL-6. However, lobar PHO regions (vs. deep) had significantly higher K^{trans} (0.55 x 10^{-3} min^{-1} vs. 0.27 x 10^{-3} min^{-1};p=0.01) and BP_{ND} (0.24 vs. 0.06;p=0.02). Median K^{trans}, but not BP_{ND}, was negatively correlated with 90-day mRS (r=-0.48, p=0.003; Fig2).

Conclusions: Perihaematomal BBB permeability and activated microglia/macrophages are increased in subacute ICH and are higher in lobar ICH vs. deep. Higher BBB permeability at day 1-3 was associated with better 90-day mRS, suggesting subacute BBB breakdown might be beneficial in ICH.

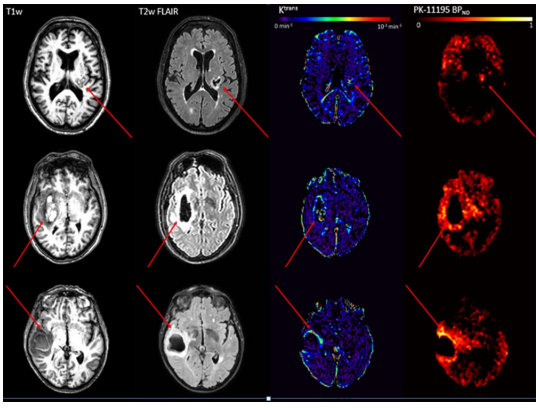

Fig 1. Representative patients.

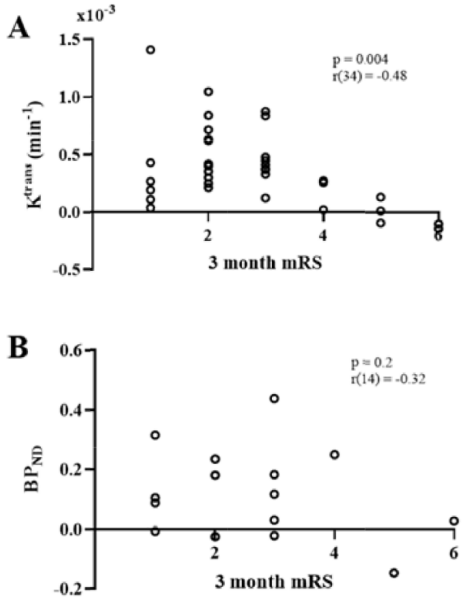

Fig 2. markers vs. 90d mRS.

Disclosure of interest: No

2582

Untargeted metabolomics comparing ischemic and hemorrhagic stroke patients identifies potential treatment targets of common and distinct pathophysiological mechanisms

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Background and aims: Treatment options for patients with acute ischemic stroke (IS) or intracerebral hemorrhage (ICH) remain limited. Metabolites are effectors of key biological processes such as energy supply and cell signaling. We aimed to determine the circulating metabolome to capture common and distinct disease mechanisms of IS and ICH to identify novel treatment targets.
Methods: As part of the PRecisiOn Medicine In StrokE (PROMISE) study, we performed untargeted metabolomics of serum samples obtained upon hospital admission within 24 hours of onset from 504 patients with IS, 129 patients with ICH, 52 patients with stroke mimics (SM), and 102 healthy controls (HC). We assessed metabolic changes at a global, class, pathway and individual metabolite level by performing clustering, network, pathway, and location enrichment analyses as well as multivariable regression models.
Results: Across analytical levels, the circulating metabolome of patients with acute IS and ICH showed larger similarities compared to patients with SM and HCs. Comparing IS and ICH on a pathway and individual metabolite level, we found stronger impact in IS on glutathione metabolism, a key pathway to neutralize reactive oxygen species, and arginine and proline metabolism, which is both linked to endothelial health and thrombosis. Arginine levels were negatively associated with routine coagulation tests suggesting pro-thrombotic effects.
Conclusions: Our study identifies circulating metabolites linked to thrombosis, endothelial dysfunction, and redox systems as potential biomarkers and treatment targets of distinct pathophysiological mechanisms in patients with IS and ICH. Additional data on imaging and clinical outcomes will be presented at ESOC.
Disclosure of interest: No

IMAGING DAY 2

720

Insights from quantitative T1 and diffusion imaging into white matter hyperintensity tissue pathology

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Background and aims: Some white matter hyperintensities (WMH) may progress or regress but little is known about the underlying mechanisms. We assessed tissue signatures in areas of normal-appearing white matter (NAWM) and WMH changes over 1-year in mild stroke patients using brain MRI.
Methods: We, prospectively, acquired structural and diffusion imaging from patients with mild stroke at baseline (⩽3 months after stroke). We derived masks of stable NAWM, stable WMH, progressing and regressing WMH reflecting change over 1-year (Figure1), and calculated quantitative T1 (QT1), fractional anisotropy (FA), mean diffusivity (MD), neurite density index (NDI), orientation dispersion index (ODI) and free water fraction (FWF) in each tissue area at baseline, and for FA and MD also at 1-year. Using unadjusted one-way ANOVA with Tukey post-hoc analyses, we assessed differences between mean values in tissue areas.
Results: Amongst 191 patients, mean baseline age= 65.9 [SD=11.0], there were clear differences at baseline between stable NAWM and stable WMH (Figure2). WMH progress/regress had intermediate values between stable WMH and stable NAWM. Mean WMH regress and progress values differed significantly for FA, MD, NDI and QT1 (p-values: 0.014, 0.005, <0.001, <0.0001; unadjusted). MD at 1 year (N=189) in the same areas (Figure3) shows higher MD values in progressing WMH than at baseline, while values in other areas remain similar to baseline.
Conclusions: Regressing and progressing WMH tissue have different underlying tissue signatures from stable WMH and NAWM, 1 year prior to these changes becoming apparent on conventional MRI, and could be predictable.

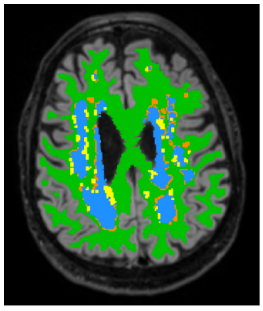

Figure 1.
Stable NAWM = NAWM at baseline and 1 year (green)
Stable WMH = WMH at baseline and 1 year (blue)
WMH progress = NAWM at baseline and WMH at 1 year (amber)
WMH regress = WMH at baseline and NAWM at 1 year (yellow)

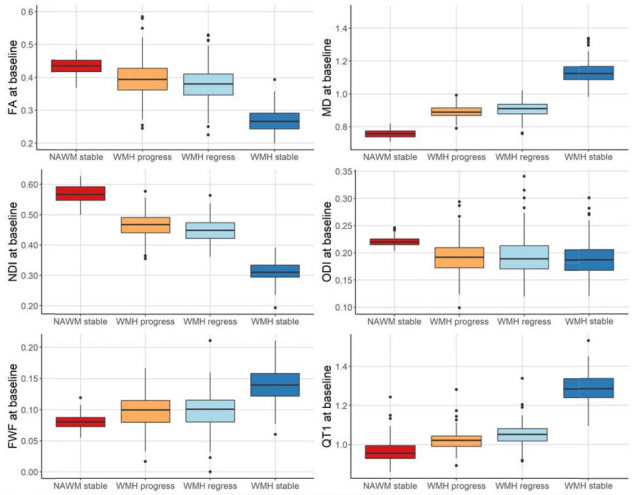

Figure 2. Fractional Anisotropy (FA), Mean Diffusivity (MD), Neurite Density Index (NDI), Orientation Dispersion Index (ODI), Free Water Fraction (FWF) and quantitative T1 at baseline in areas of NAWM and WMH change

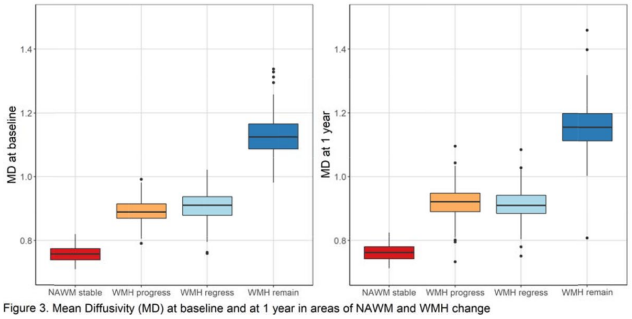

Figure 3. Mean Diffusivity (MD) at baseline and at 1 year in areas of NAWM and WMH change

Disclosure of interest: No

735

A latent clinical-anatomical dimension relating metabolic syndrome to brain morphology

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Background and aims: Metabolic syndrome (MetS) describes an obesity-related risk profile promoting cerebrovascular disease. To examine its effects on brain morphology, we analyzed behavioral and structural magnetic resonance imaging data from 15010 individuals from the UK Biobank (UKB) and Hamburg City Health Study (HCHS).

Methods: The multivariate relationship of vertex-wise cortical thickness and MetS component risk factors was examined performing a partial least squares correlation (PLS) analysis. To investigate potential determinants of MetS effects on brain morphology, we performed a virtual histology analysis relating the pattern of MetS-related cortical thickness effects to density indices of 20 cell types.

Results: PLS identified a significant latent variable (77.09% explained shared variance, figure 1a) relating higher severity of MetS components (*figure 1b*) to lower cortical thickness in orbitofrontal, medial frontal, insular, anterior cingulate and temporal areas (*figure 1c*). The identified MetS effects pattern on cortical thickness was significantly positively correlated with the density of endothelial cells ($Z_{r_{sp}}$ = .208, p_{FDR} = .020), microglia ($Z_{r_{sp}}$ = .310, p_{FDR} = .040), excitatory neurons type 8 ($Z_{r_{sp}}$ = .203, p_{FDR} = .040) and oligodendrocytes ($Z_{r_{sp}}$ = .235, p_{FDR} = .040) indicating that MetS effects on cortical thickness are strongest in regions of the highest density of these cell types (*figure 2*).

Conclusions: Integrated data-driven statistics revealed a single clinical-anatomical dimension explaining most variance of the association between MetS-related vascular risk and cortical thickness, highlighting its low-dimensional nature. The associated pattern of MetS-related brain morphological abnormalities was governed by local histological features.

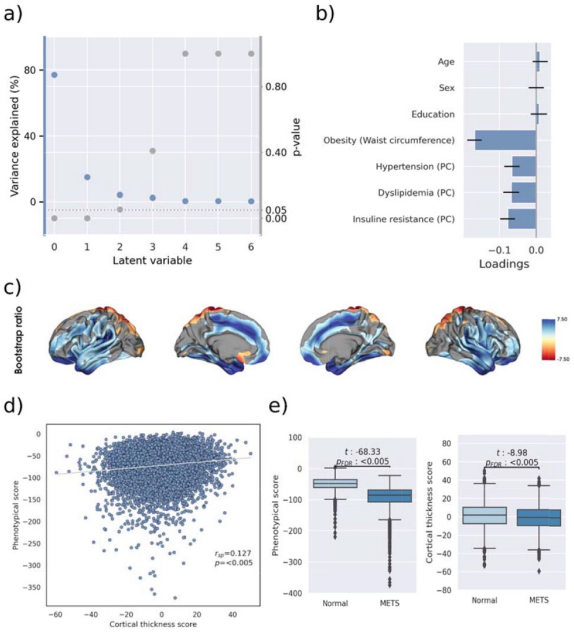

Figure 1.

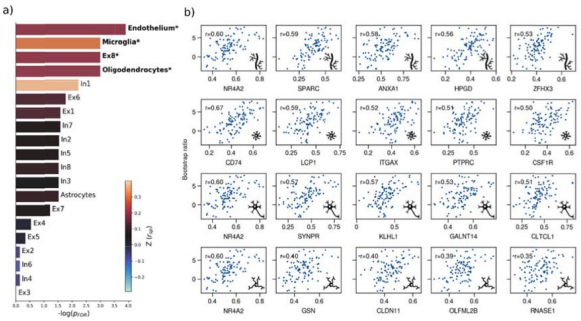

Figure 2.

Disclosure of interest: No

821

Three-dimensional MRI and angiography fusion image for subcortical infarction: can fusion images assess the culprit perforating artery?

Junpei Koge*[1], Shiori Ogura[1], Kanta Tanaka[2], Shuhei Egashira[1], Takeshi Yoshimoto[3], Masayuki Shiozawa[1], Yasutoshi Ohta[4], Tetsuya Fukuda[4], Masafumi Ihara[3], Kazunori Toyoda[1], Masatoshi Koga[1]

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Background and aims: Visualization of perforating arteries in subcortical infarction by in vivo imaging is challenging. We aimed to investigate whether culprit perforating arteries of subcortical infarctions can be assessed using the image fusion technique.

Methods: Consecutive patients who have ischemic stroke in the anterior circulation perforating area (caudate nucleus, lentiform nucleus, internal capsule, corona radiata, or centrum semiovale) and underwent three-dimensional rotational-angiography (3D-RA) and three-dimensional FLAIR MRI were retrospectively reviewed. The registration of images was performed using the original fusion software based on the MeVisLab software. The presence of the culprit perforating artery that penetrates the infarction and its morphological characteristic was assessed in fusion images. Clinical features were compared among groups.

Results: A total of 117 patients were analyzed. The culprit perforating artery was identified in 51 patients (44%). These 51 patients were younger and had a higher baseline NIHSS score and more commonly had infarcts in the lentiform nucleus than others. Of 44 patients in whom the morphology of the culprit perforating artery could be assessed, the stenosis in the proximal segment (orifice or cerebrospinal fluid segment) was observed in 27 patients. Atrial fibrillation was less frequent in patients with stenosis in the proximal segment of the culprit perforating artery than in those without (4% versus 29%, *P*=0.03).

Conclusions: The present 3D-RA and MRI fusion technique allows evaluation of culprit perforating arteries of subcortical infarctions especially in the lentiform nucleus. The morphological feature of the culprit perforating artery may be associated with the stroke etiologic mechanis

Disclosure of interest: Yes

824

Moving from CT-first to MRI-first paradigm in acute ischemic stroke: effects on time metrics and revascularization rates and safety

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Background and aims: Neuroimaging is necessary before intravenous thrombolysis (IVT) and endovascular treatment (EVT) for acute ischemic stroke (AIS). Both CT and MRI are possible first-line approaches in the acute setting. In May 2018, we switched from CT to MRI as first line imaging for suspected AIS. Here, we aimed at retrospectively assessing the effects of this paradigm change on revascularisation metrics and safety.
Methods: From the Acute STroke Registry and Analysis (ASTRAL) we selected identical number of patients during the MRI-first-period (05/2018-08/2022) and the preceding CT-first-period. We compared outcome measures in the two periods by univariate and multivariate analysis.
Results: We assessed 1131 consecutive thrombolyzed and 662 thrombectomized patients. After switching the imaging-paradigm, 80% of patients underwent MRI. Median door-to-needle-time was 31min (IQR=24-48) in the CT-period vs. 43min (IQR=33-58) in the MRI-period (+12 min,$p_{univ}<0.01$), while door-to-groin-time was unchanged (-3 min,$p_{univ}=1$). In the CT vs. MRI periods, rates of missed thrombolysis opportunities were respectively 3.1% vs. 0.8% ($p_{univ}<0.01$); rates of symptomatic intracranial haemorrhage (SICH) after IVT were numerically, but non-significantly, lower (5.6% vs 3.2%,$p_{adj=}0.07$) and SICH after EVT(±IVT) were similar (6.5% vs 4.2%,$p_{adj}=0.21$). Disability at 3 months was unaffected for both IVT and EVT-treated patients (common adjusted odds ratio for favourable Rankin shift 1.23,95%CI=0.96-1.58;p=0.1 and 0.93,95%CI=0.67-1.29,p=0.674 respectively).
Conclusions: In our comprehensive stroke centre, transition from CT to MRI as first-line imaging before revascularizing AIS reduced the rates of missed thrombolysis opportunities. We observed longer door-to-needle and stable door-to-groin times during the MRI-period. Safety (SICH) and 90-day disability were not affected.
Disclosure of interest: Yes

1200

Incidence and impact of thrombus migration before endovascular treatment: Results from the AcT trial

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Background and aims: Intravenous thrombolysis often results in thrombus migration in acute stroke with planned endovascular treatment(EVT). We compared the effect of tenecteplase (0.25 mg/kg) versus alteplase (0.9 mg/kg) on the incidence of thrombus movement and the resulting impact on functional outcomes in a pragmatic clinical trial.
Methods: Patients with identifiable intracranial occlusion on pre-treatment CT angiography (CTA) were included. Thrombus movement from pre-treatment CTA to the first angiographic run of EVT was classified into: no change, thrombus extension (TE), thrombus migration (TM) (shift to a more distal angiography target occlusion, i.e. ICA-M1, M1-M2,etc.), or recanalization. The primary clinical outcome measure was the proportion of patients with modified Rankin scale(mRS) 0-2 at 90 days. The imaging outcome measure is the proportion of patients with extended thrombolysis in cerebral infarction(eTICI) 2b-3 post EVT.
Results: This study included 499 patients. No change in thrombus location was seen in 401 (80.4%), TE in 6 (1.2%), TM in 77 (15.4%), and complete recanalization in 15 (3.0%). Tenecteplase (n=253) was associated with higher rate of TM compared to alteplase (19.4% versus 11.4%,adjusted odds ratio[aOR] 1.86, 95%CI 1.12-3.08). TM did not impact final successful reperfusion (aOR 0.74,95%CI 0.40-1.40) but was associated with increased odds of 90-day functional independence (aOR 1.81,95%CI 1.06-3.11). Thrombolytic type did not modify the relationship between TM and functional independence (p interaction=0.19)
Conclusions: Intravenous tenecteplase is associated with a higher rate of TM before EVT compared to alteplase. Thrombus migration is associated with better clinical outcomes, regardless of the thrombolytic agent used.
Disclosure of interest: No

1279

Prevalence of intracranial stenosis in a general population using 3D-time of flight magnetic resonance angiography. The Tromsø Study

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Background and aims: Intracranial arterial stenosis (ICAS) is regarded a major cause of recurrent ischemic stroke in Asian, Hispanic and Afro-Americans. Data on prevalence of ICAS in Caucasians is sparse. The aim of the study was to assess the prevalence of ICAS in a mainly Caucasian general population.
Methods: Cross-sectional population-based study using 3-dimensional time-of-flight 3 Tesla magnetic resonance angiography to assess the prevalence of ICAS in 1847 men and women aged 40 to 84 years. ICAS was defined as a lumen diameter reduction of ⩾50% and was assessed by the the Warfarin-Aspirin- Symptomatic Intracranial Disease (WASID) method

and the newly proposed visual grading system for intracranial arterial stenosis on MRA (MRA_{VICAST}) method.
Results: The overall prevalence of ICAS was 7.0% (95% confidence interval (CI) 5.9–8.2), 5.1% (95% CI 3.8–6.7) in women and 9.1% (95% CI 7.3–11.3) in men and increasing by age (Figure 1). 58.6% of the ICAS were localized in the internal carotid artery, 28.7% in posterior circulation and 9.4% in the middle cerebral artery and 3.3% in the anterior cerebral artery. The degree of stenosis was moderate (50%-69%) in the majority of vessels (82.3%).
Conclusions: Prevalence of ICAS⩾50% in this study is similar to other studies of Caucasians but the location and severity of ICAS differ from previous studies, which partly can be explained by both imaging technique and methods to assess stenosis.

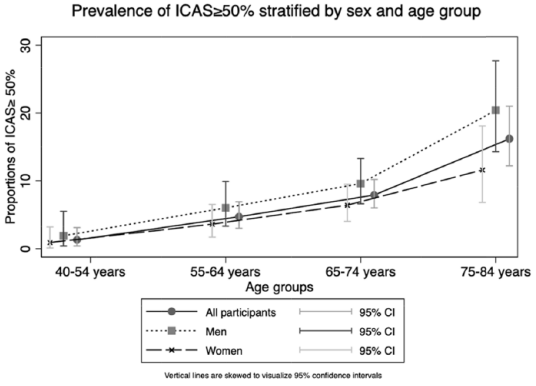

Figure 1.

Disclosure of interest: No

1393

Fully automatic intracranial thrombus segmentation prediction from non-contrast CT and CT angiography

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Background and aims: Thrombus characterization on neuroimaging might optimize reperfusion treatments in stroke patients presenting a large vessel occlusion (LVO). Evaluations reliant on manual annotations are time-consuming and subject to significant inter-observer variability. A fully-automated image processing pipeline for consistent thrombus volume prediction may yield useful information pre-operatively.
Methods: A prospectively maintained database encompassing 250 suspected LVO patients (200 LVO [middle-cerebral-artery MCA] /50 no-LVO), was used for this study. The prediction pipeline employs a series of machine-learning methods to process head-and-neck non-contrast CTs and CT-angiographies (CTA) using 185 for training and 65 for testing (50 LVO/15 No LVO).
First, a convolutional neural network (CNN) was trained to segment intracranial vessels from CTA and the result is processed for vessel labelling and LVO laterality prediction. A region-of-interest (ROI) of probable LVO presence is inferred and segmented by another CNN to extract thrombus features.
Results: The method correctly predicted the ROI in 86% (43/50) of LVO patients. The thrombus was segmented in 42/43 (1 missed case) with an average Dice-coefficient of 0.65±0.15 (MCA-M1 0.63±0.15, MCA-M2 0.70±0.09) and Pearson-volume-correlation 0.66±0.14 (MCA-M1 0.64±0.15, MCA-M2 0.71±0.09), with mean volume of 101.6 ± 83.8 mm^3 for the predicted thrombus and 114.7 ± 74.8 mm^3 for the ground truth. Specificity and sensitivity of correct LVO detection were 0.84 and 0.67, respectively.
Conclusions: A method for anterior circulation LVO detection and characterization was developed for thrombus characterization in patients with ischemic stroke, relying on pre-procedural imaging. Derived information may predict recanalization rates with endovascular treatment ahead of interventions.
Disclosure of interest: No

1483

INFARCT VOLUME AND LONG-TERM NEUROLOGICAL OUTCOME AFTER ARTERIAL ISCHEMIC STROKE OF CHILDHOOD

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Background and aims: There is limited knowledge regarding stroke volume and outcome in childhood stroke. The aim of the study is to compare the prognostic value for long-term outcome of 3 different volumetric techniques in acute diffusion-weighted imaging (DWI): Modified Pediatric Alberta Stroke Program Early Computed Tomography Score (modASPECTS), the simplified volumetric estimation using the ABC/2 formula, and segmentation (3D slicer).
Methods: 173 children with the diagnosis of arterial ischemic stroke (AIS) recorded in 2 different registries entered the study (prospective registration and retrospective analyses): the Swiss NeuroPaediatric Stroke Registry (SNPSR) (n=144) and the Georgian registry (n=29). All patients had DWI in the acute phase and outcome values with the Pediatric Stroke Outcome Measure (PSOM) at ⩾2 years after stroke. Children with pre-existent developmental delay were excluded. For the modASPECTS the ischemic lesion on DWI was scored with a maximum of 23 points in each hemisphere; In the ABC/2 method, the maximal length(A), width(B), and height(C) of the lesion on DWI,were multiplied and divided by 2;
3D slicer volumetric software program was used for segmentation. Depending on the variations of whole-brain volume according to children's age, a segmented infarct volume was divided by total brain volume.
Results: All of these 3 methods had a significant association with ⩾2 years PSOM (modASPECTS: Spearman's rho=0.561,$p<0.000$; ABC/2: Spearman's rho=0.546,$p<0.000$; Segmentation: Spearman's rho=0.532, $p<0.000$).
Conclusions: Infarct volume in acute imaging is a good predictor of neurological outcome. ModASPECTS is likely the best, as there is not only information on volume but also localization in it.
Disclosure of interest: No

1680

7T MRI lacunar stroke study

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Background and aims: The pathophysiological basis for lacunar infarction remains unclear. The susceptibility vessel sign (SVS) on MRI is associated with thrombotic large vessel occlusion and has been reported in lacunar infarcts imaged at 1.5T, analysing T2* imaging retrospectively. We investigated SVS in lacunar stroke with 7T MRI using susceptibility-weighted imaging (SWI) and time-of-flight (TOF) MR angiography (MRA).
Methods: We performed a single-centre prospective observational study using 7T MRI in patients with recent small subcortical infarct confirmed on 1.5 or 3T MRI. Two Neuroradiologists and a Stroke Neurologist independently reviewed SWI and TOF-MRA sequences blinded to radiological and clinical data. Images were reviewed for SVS, associated occluded small vessel, and cerebral microbleeds. SVS was considered positive if reported by ⩾2 raters in the relevant hemisphere.
Results: Twenty people (10 male: 10 female), mean age 71.4 years (range 53 to 95), median NIHSS 3 (IQR 2 to 4.75), underwent 7T MRI. There was SVS agreement in 6 out of 20 scans (30%). TOF MRA review confirmed corresponding occluded small vessel in 2 of 20 patients (10%), a peduncular perforating artery proximal to internal capsule infarct and a lenticulostriate artery proximal to left external capsule infarct.
Conclusions: SVS was observed in 6 of 20 (30%) people with recent small subcortical infarct, and vessel occlusion was confirmed in 2 (10%) cases. This supports a thrombotic mechanism in a proportion of acute lacunar infarcts.
Disclosure of interest: No

1731

Intracranial hemorrhage patterns and association with clinical outcome in acute stroke treated with tenecteplase versus alteplase: Results from the AcT trial

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Background and aims: Data on intracranial hemorrhage (ICH) in patients receiving intravenous tenecteplase for ischemic stroke is limited. We compare the incidence and impact of various hemorrhagic patterns on functional outcomes of patients receiving tenecteplase versus alteplase.
Methods: Patients with follow-up scans who received any dose of thrombolytic from the Alteplase compared to Tenecteplase (AcT) trial were included. Parenchymal hemorrhage was assessed using the Heidelberg bleeding classification. Primary outcome was 90-day modified Rankin Scale (mRS) 0-1. Mixed-effects logistic regression (adjusted for age, sex, stroke severity, onset to needle time, and ASPECTS on follow-up imaging as a proxy for final infarct volume) was performed. Interactions between thrombolytic type and hemorrhage type were also tested.
Results: A total of 1549 patients (median age=74 years [IQR: 63-83], 741 [47.8%] females) were included. ICH occurred in 311 (20.1%) patients (median volume 1.5 [IQR 0.4-6.6] mL). Among these, hemorrhagic infarction type 1 (HI1) was seen in 44 (2.8%), HI type 2 (HI2) in 134 (8.7%), parenchymal hematoma type 1 (PH1) in 58 (3.7%), and PH type 2 (PH2) in 43 (2.8%). Any ICH, PH2 subtype and increasing ICH volume were associated with lower odds of 90-day-mRS 0-1 ([aOR=0.67; 95%CI=0.48-0.93], [aOR=0.17; 95%CI=0.04-0.74)] and [aOR=0.95 per 1 mL; 95%CI=0.90- 0.99] respectively). These relationships were not modified by the thrombolytic type (all p-interaction $>$ 0.05).
Conclusions: Patients with any ICH on follow-up and those with increasing volume or mass effect were associated with worse functional outcomes in the AcT trial. This relationship was similar between tenecteplase and alteplase
Disclosure of interest: No

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Intracranial Artery Calcification in White and Non-White Ischemic Stroke Patients – Erasmus Stroke Study

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Background and aims: Data on the burden and determinants of intracranial arterial calcifications (IAC) are mainly available from Asian, Black and Hispanic stroke patients. However, data from White patients remains scarce. We assessed the burden and determinants of IAC in ischemic stroke patients from a Dutch academical hospital.
Methods: Between December 2005 and October 2010, 1248 patients (mean age 62.5 (SD ±14.0) years, 80.9% White) were recruited, of whom 771 had ischemic stroke and 477 transient ischemic attack. CT-angiography was conducted as part of the routine stroke analysis protocol. These images were assessed for the presence, distribution, and volume (in mm^3) of arterial calcification in the intracranial carotid and vertebrobasilar arteries. Using adjusted logistic and linear regression models, we investigated associations between demographic and cardiovascular determinants with prevalence and volume of IAC. Analyses were then restricted to White patients only.

Results: IAC was present in 60.1% of internal carotids and 13.0% of vertebrobasilar arteries, affecting 60.9% of patients. Median volume of IAC was 22.8 (interquartile range 5.2-72.4) mm³, 22.8 (5.1-70.7) mm³ for affected internal carotids and 3.1 (0.8-13.2) mm³ for affected vertebrobasilar arteries. History of smoking (adjusted OR 2.81(95% CI [2.07-3.82]), ischemic heart disease (2.12[1.35-3.33]), and diabetes mellitus (1.51[1.10-2.09]) were independent determinants of IAC prevalence and volume. Restricting our analyses to White patients did not significantly change estimates.

Conclusions: In contrast to previous notions that IAC affects mostly non-White stroke patients, three out of five patients in this study had IAC and IAC was seen more frequently among White patients.

Disclosure of interest: No

Table 1 – Characteristics of N = 1248 patients.

Characteristic		n/median	%/IQR
Age at stroke, years		63.0	53.1-73.1
Sex, female		593	47.5
Whites		1010	80.9
Hypertension		819	65.6
Diabetes mellitus		423	33.9
Hypercholesterolemia		902	72.2
Low HDL-cholesterol		459	36.8
Smoking status			
	Never	447	35.8
	Former	376	30.1
	Current	425	34.1
eGFR, ml/min/1.73m²		80.0	67.0-91.0
Impaired kidney function (eGFR <60)		189	15.1
Previous TIA or ischemic stroke		277	22.2
Previous ischemic heart disease		210	16.7
Previous atrial fibrillation		88	7.1

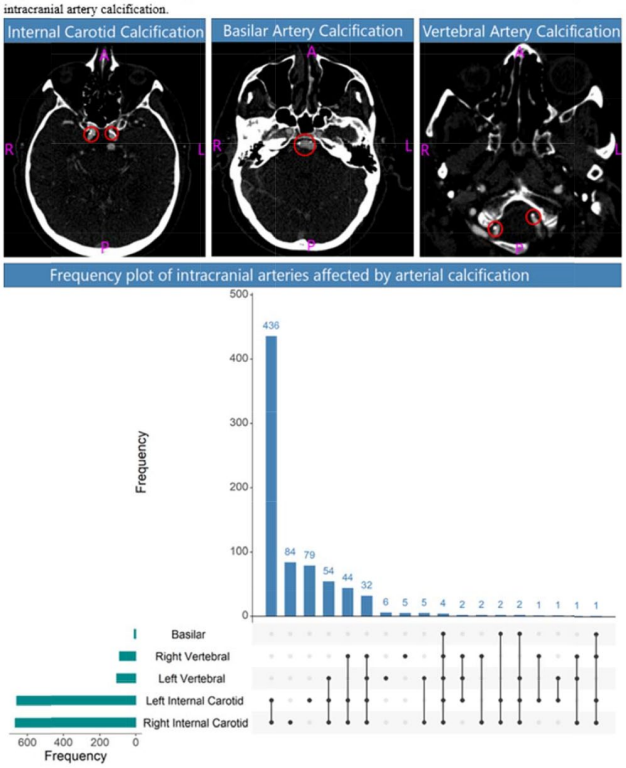
HDL = High-density lipoprotein, eGFR = estimated glomerular filtration rate, TIA = transient ischemic attack

Table 2 – Results of regression analyses for presence and volume of IAC with demographic and cardiovascular determinants.

Characteristic	Presence of IAC Adjusted OR [95% CI]	Volume of IAC Adjusted mean log volume difference [95% CI]
Age at event, 1 year increase	1.10 [1.08-1.11]*	0.06 [0.04-0.06]*
Male sex	1.50 [1.13-2.00]*	-0.21 [-0.34-0.20]
Hypertension	1.29 [0.95-1.76]	0.04 [-0.17-0.25]
Diabetes mellitus	1.63 [1.17-2.26]*	0.37 [0.16-0.58]*
Hypercholesterolemia	1.28 [0.92-1.79]	0.15 [-0.06-0.36]
Low HDL-C	1.48 [1.10-2.00]*	0.10 [-0.09-0.30]
Impaired kidney function	0.87 [0.57-1.34]	0.09 [-0.18-0.35]
Smoking history	2.86 [2.11-3.87]*	0.69 [0.50-0.89]*
Previous ischemic stroke or TIA	0.98 [0.69-1.39]	0.13 [-0.09-0.34]
Previous ischemic heart disease	2.19 [1.39-3.46]*	1.04 [0.78-1.29]*
Previous atrial fibrillation	0.81 [0.44-1.50]	-0.10 [-0.46-0.26]

Estimates originate from full model incorporating all characteristics. IAC = intracranial artery calcification, HDL-C = High-density lipoprotein cholesterol, TIA = transient ischemic attack.
**P < 0.05*

Figure 1 – Transversal Computed Tomography Angiography examples of intracranial artery calcification with a graphical overview of the frequency distribution for different combinations of intracranial arteries affected by intracranial artery calcification.



PROGNOSIS AND OUTCOME DAY 2

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ISOSORBIDE MONONITRATE, CILOSTAZOL AND THEIR COMBINATION: EFFECT ON MULTIPLE OUTCOMES AFTER LACUNAR STROKE ASSESSED USING THE STROKE IMPACT SCALE: THE LACUNAR INTERVENTION TRIAL-2 (LACI-2)

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Background and aims: Lacunar ischaemic stroke, a form of small vessel disease (SVD), causes functional, cognitive, mood and mobility impairments, with no specific treatment. The LACunar Intervention Trial-2 (LACI-2, ISRCTN14911850) assessed safety and efficacy of isosorbide mononitrate (ISMN) and cilostazol over one year, examining multiple outcomes using the Stroke Impact Scale (SIS).

Methods: LACI-2 was an investigator-initiated randomised open-label blinded-endpoint 2x2 factorial trial. Participants age >30yrs with clinical lacunar ischaemic stroke, compatible MR/CT brain imaging, and capacity to consent, were randomised to one year of ISMN 25mg bd, cilostazol 100mg bd, both or neither. Physical and cognitive function, dependency, mood, and recovery were assessed using the SIS masked to treatment. Analyses of the nine individual SIS sub-domains were co-variate adjusted; a composite of all SIS domains (Global SIS) was analysed using the Wei-Lachin test. Data are median [interquartile range], Mann-Whitney difference (MWD, 95% confidence interval).

Results: From 05/02/2018-31/05/2021, LACI-2 recruited 363 patients at 26 UK hospitals. Baseline characteristics were well balanced: age 64 [56-72] years, female 112 (31%), stroke-to-randomisation 79 [27-244] days. LACI-2 retained 358 (99.0%) participants at one year, 318 (89%) completed the SIS. ISMN improved 6/9, cilostazol improved 0/9, and ISMN+cilostazol improved 8/9 individual SIS sub-domains. ISMN (MWD -0.14, -0.24,-0.04; p=0.005) and ISMN+cilostazol (MWD -0.17m -0.31,-0.03; p=0.017) improved Global SIS.

Conclusions: LACI-2 suggests that ISMN, alone or with cilostazol, given for one year, may improve multiple common self-reported adverse physical, cognitive, and functional outcomes after lacunar stroke; a definitive phase-3 trial in lacunar stroke (LACI-3) is planned.

Disclosure of interest: No

1716

ASSOCIATION OF PRESTROKE DISABILITY WITH CLINICAL OUTCOME AFTER THROMBECTOMY IN VERTEBROBASILAR STROKE

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Background and aims: Little is known on the impact of prestroke disability on endovascular treatment (EVT) outcomes in vertebrobasilar stroke in clinical practice.

Methods: We studied patients with vertebrobasilar stroke undergoing EVT between 2015 and 2021 from the German Stroke Registry, an ongoing, academic, prospective, multicenter registry. Prestroke disability was categorized into "no disability" (modified Rankin Scale (mRS) <=1), "slight disability" (mRS =2), "moderate disability" (mRS =3), and "severe disability" (mRS>=4). The primary outcome measure was a favorable functional outcome, defined as 90-day mRS score of 0 or 1 or no accumulation of disability. Logistic regression analysis was used to assess the association between prestroke disability and favorable outcome, adjusted for patient characteristics and procedural data.

Results: We retrieved data from 755 patients with vertebrobasilar stroke, including 620 patients with no prestroke disability, 46 patients with slight, 52 patients with moderate and 37 with severe prestroke disability. Patients with any prestroke disability were older, received less often intravenous thrombolysis, were more frequently female and exhibited more severe stroke severity at admission. Patients without disability achieved favorable outcome in 29.7% compared to 28.1 % patients with any prestroke disability (p=0.8). After adjustment for patient characteristics and procedural data, prestroke disability was not associated with functional outcome in patients with vertebrobasilar stroke in patients with slight, moderate, and severe prestroke disability (Figure 1).

Conclusions: Patients with prestroke disability should be considered for EVT in vertebrobasilar stroke.

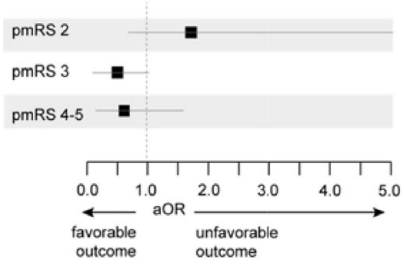

Figure 1. Association of prestroke disability with functional outcome compared to patients without prestroke disability.

Disclosure of interest: No

1723

Prevalence and associations of adverse non-motor outcomes after stroke: comprehensive systematic review and meta-analysis including 105,358 participants

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Background and aims: Adverse non-motor outcomes (anxiety, depression, fatigue, sleep disturbance, social participation, pain, bowel, and bladder function) are key determinants of quality of life after stroke but are often studied in isolation. The aim of this comprehensive metanalysis was to systematically identify the prevalence of non-motor outcomes after stroke and their associations with key patient characteristics.

Methods: We searched PubMed, Embase, Medline via PubMed, and PsycINFO between January 1999 to December 2020 using a pre-specified search strategy. We included studies that described ischaemic, intracerebral haemorrhagic or mixed stroke cohorts with prospective assessment of non-motor outcomes. Pooled prevalence plots of estimates weighted by study sample size were created with random-effects meta-analysis. We investigated associations of key patient characteristics across studies with non-motor outcome prevalence including, stroke type (ischaemic stroke *vs* intracerebral haemorrhage), sex, age at stroke onset, follow-up time, and cohort (hospital *vs* population).

Results: Of 7,905 articles screened, we included 254 relevant studies involving 105,358 patients with a median follow-up period of 6.4 years ([IQR 1.4 – 10.2]. Sexual dysfunction (59.8%) sleep disturbance (58.8%); bowel constipation (58.3%); reduced social participation (57.9%); adverse bladder function (45.9%); and fatigue (43.9%) were the most prevalent adverse non-motor outcomes with high heterogeneity across studies. ICH stroke, female sex, and hospital-based studies were associated with a higher prevalence of non-motor outcomes across multiple domains.

Conclusions: Adverse non-motor outcomes in multiple domains are highly prevalent after stroke; ICH survivors and females are at high risk. The high heterogeneity might be explained by methodological differences between studies.

Disclosure of interest: No

1752

Comparison of 7-day NIHSS and 90-day mRS outcomes in randomized-controlled trials of acute ischemic stroke: A meta-analysis

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Background and aims: Given that various factors independent of acute ischemic stroke (AIS) can confound conventional 90-day outcomes in randomized-controlled trials (RCTs) of acute treatments, we examined whether assessments of the National Institutes of Health Stroke Scale (NIHSS) within 7-days post-stroke could provide trial results in agreement with 90-day outcomes on the modified Rankin Scale (mRS).

Methods: We conducted a meta-analysis including RCTs of AIS published until 31-Jan-2021, examining treatments started within 48-hours and completed within 7-days of stroke onset, with available data for both 90-day mRS and NIHSS within 7-days. Outcomes were analyzed in accordance with published protocols whenever feasible.

Results: We included 82 RCTs with NIHSS and mRS data (32,190 patients, average age 68.0-years, 46.3% women). In total, these trials contributed 99 NIHSS assessments performed across time points from 24-hours to 7-days (Figure 1). When classifying trial results as positive or negative/neutral, there was agreement between NIHSS and mRS assessments in 83 (83.8%) cases. Agreement varied numerically by timing of NIHSS assessments, from 83.0% at 24 hours (n=47) to 72.7% at 7-days (n=22), but differences were not significant (p=0.26).

Conclusions: NIHSS assessed within 7-days post-stroke has an overall high agreement with 90-day mRS in identifying positive versus neutral/negative RCTs, indicating its value as an alternative primary outcome measure for AIS treatments. Similar agreement with mRS may be achieved with earlier NIHSS assessments within 24-hours – an important consideration for AIS RCTs as patients may often be transferred/discharged from the RCT site after a few days, complicating later in-person assessments.

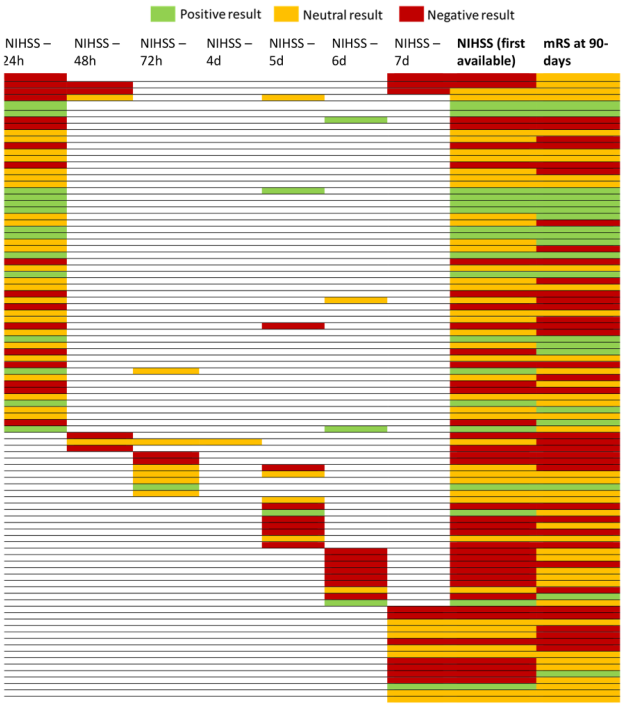

Figure 1. Colour-coded summary of the results of the meta-analysis. Each row represents one trial (or one trial treatment arm, for trials with multiple treatment arms) and each column represents the result for that trial (positive, negative, or neutral) based on the NIHSS assessed at a given time-point between 24-hours and 7-days. The far right of the figure shows a single NIHSS-based result for each trial, using the NIHSS at the earliest available time-point, along with the trial result when using the 90-day mRS.

Disclosure of interest: No

1785

IDENTIFYING PATIENTS WITH EXTRACRANIAL VERTEBRAL ARTERY STENOSIS WHO CAN BENEFIT FROM STENT PLACEMENT: POST HOC ANALYSIS FROM RANDOMIZED CONTROLLED TRIALS

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Background and aims: Stent placement is a treatment option to reduce the risk of ischemic events in patients with extracranial vertebral artery stenosis (EVAS). However, the patient subgroups that can potentially benefit from stent placement is not well defined.

Methods: We performed an individual patient data analysis of patients with EVAS (measuring ⩾50% in severity) enrolled in two randomized controlled trials. We compared the risk of vertebrobasilar arterial distribution (VBA) stroke and/or death post randomization between patients who underwent stent placement and those who received medical treatment.

Results: VBA stroke and/or death occurred in 28 (11.5%) of the 244 patients (mean age ±SD, 66.84 ± 10.06 years) with EVAS during a median follow-up period of 37.39 (IQR 22.19-51.18) months. In the overall cohort, there was no difference in either VBA stroke and/or death (Hazard Ratio [HR] 1.3, 95% CI 0.61-2.75) between patients treated with medical treatment and those treated with stent placement. The risk of VBA stroke and/or death was higher in medically treated patients among patients with stroke as a qualifying event (16.18% vs 11.84%, HR 1.69, 95% CI 0.72-3.99), those randomized within 30 days of a qualifying event (16.25% vs 10.71%, HR 1.51, 95% CI 0.63-3.66), and in those with both stroke (qualifying event) and randomized within 30 days of a qualifying event (20.45% vs 12%, HR 1.89, 95% CI 0.67-5.34).

Conclusions: Certain patient subgroups with EVAS can potentially benefit from stent placement and should be further evaluated in clinical trials.

Disclosure of interest: No

1922

Sex-Differences in Functional Outcome of Patients with Acute Ischemic Stroke Treated with Thrombolysis

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Background and aims: Functional outcome after intravenous thrombolysis for ischemic stroke has improved over time, but we previously observed consistently worse outcomes in female patients; the aim of this study was to further investigate these differences and explore potential explanations.

Methods: This analysis is based on data from the Austrian Stroke Unit Registry covering the years 2006-2021, including patients who have been treated with intravenous thrombolysis. The primary outcome parameter was favourable functional outcome (modified Rankin Scale (mRS) 0-2) at 3 months. Sex-specific influences of baseline characteristics on functional outcome were evaluated by logistic regression analysis.

Results: Overall, 11840 patients were included in this analysis; 5503/11840 (46.5%) were female. In women, 2498/5503 (45.5%) achieved favourable functional outcome, compared to 3787/6337 (59.8%) of men. Age, stroke severity, premorbid mRS 0-2, diabetes mellitus, prior stroke, and hyperlipidemia were associated with functional outcome in both groups, whereas year of treatment (adjOR=1.04,95%CI=1.02-1.06), hypertension (adjOR=0.71,95%CI=0.60-0.84), smoking (adjOR=0.83,95%CI=0.70-0.97), an onset-to-door time (ODT) of >270min (adjOR=0.56,95%CI=0.37-0.85) and an unknown ODT (adjOR=0.71,95%CI=0.58-0.88) were associated only in the male population. Myocardial infarction (adjOR=0.65,95%CI=0.49-0.87) and atrial fibrillation (adjOR=0.79,95%CI=0.67-0.93) as well as a door-to-needle time of 61-120min (adjOR=0.80,95%CI=0.67-0.95) were associated with functional outcome in women but not in men.

Conclusions: Predictors of functional outcome after intravenous thrombolysis differ between males and females and a positive association between year of treatment and outcome could only be observed in men. Increasing awareness of these differences is needed to enable further improvement in functional outcome for female stroke patients.

Disclosure of interest: No

2048

Nocturnal Non-Dipping of Heart Rate is Associated with Unfavourable In-Hospital Stroke Outcome in Data Lake-Driven Analytics

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Background and aims: Post-stroke heart rate (HR) and heart rate variability (HRV) changes have been proposed as outcome predictors after stroke. We sought to use data lake-enabled continuous electrocardiograms to assess outcome-dependent differences in post-stroke HR and HRV, and to determine their utility to improve machine learning-based stroke outcome prediction.

Methods: In this observational cohort study, we included stroke patients admitted to two stroke units in Berlin, Germany, between October 2020 and December 2021 with final diagnosis of acute ischemic stroke or acute intracranial hemorrhage and collected continuous ECG data through data warehousing. We created circadian profiles of several continuously recorded ECG parameters including HR and HRV parameters. The predefined primary outcome was post-stroke disability assessed through modified Rankin Scale (mRS) at discharge with a mRS-score >2 indicating dependent functional health status.

Results: We included 625 stroke patients. 287 patients remained after matching for age and NIHSS (mean age 74.5 years, 45.6 % female, 88.9 % ischemic, median NIHSS 5). Both higher HR and nocturnal non-dipping of HR were associated with dependent functional outcome ($p < 0.01$). The examined HRV parameters were not associated with the outcome of interest. Nocturnal non-dipping of HR ranked highly in feature importance of various machine learning models.

Conclusions: Our data suggest that a lack of circadian HR modulation — specifically nocturnal non-dipping — is associated with short-term unfavorable health state after stroke, and that including HR into machine learning-based prediction models may lead to improved stroke outcome prediction.

Disclosure of interest: No

2145

ISOSORBIDE MONONITRATE/CILOSTAZOL FOR PREVENTING COGNITIVE AND GLOBAL DECLINE IN PATIENTS WITH LACUNAR CEREBRAL SMALL VESSEL DISEASE STROKE: SECONDARY OUTCOMES AT 6 MONTHS, LACI-2 TRIAL

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Background and aims: Lacunar stroke causes dependency and cognitive decline/dementia. However, there is no specific treatment to prevent these adverse outcomes.

Methods: The LACunar Intervention Trial-2 (LACI-2) assessed the feasibility, safety and efficacy of isosorbide mononitrate (ISMN, 25 mg bd) and/or cilostazol (100 mg bd) over one year using a prospective randomised open-label blinded-endpoint 2x2 factorial phase IIb design. Participants were age>30yrs, clinical lacunar ischaemic stroke, compatible MR/CT brain imaging and capacity to consent. The following focuses on 6 month clinical outcome data. Adjusted analyses (binary/ordinal logistic regression) are presented.

Results: Baseline characteristics were balanced across 363 participants: age 64 [56-72] years, females 31%, stroke onset to randomisation 79 [27-244] days. After 6 months, ISMN vs control (n=356) was associated with a reduced composite outcome (combined stroke/TIA, MI, cognitive impairment, dependency, death; adjusted odds ratio, aOR 0.74, 0.55-0.99) and a global outcome (-0.06, 95% CI -0.11, -0.01), and a tendency to less cognitive impairment (shift in 7-level scale, adjusted common OR, acOR 0.66, 95% CI 0.43-1.02). Cilostazol vs control was associated with a shift to better cognition (acOR 0.64, 95% CI 0.41-0.99) and a tendency to a better global outcome (-0.05, 95% CI -0.10, 0.00). Combined ISMN/cilostazol vs control (n=181) were associated with better cognition and global outcome.

Conclusions: ISMN and cilostazol may reduce cSVD complications after lacunar stroke, especially when given together. We will test these in the phase III LACI-3 trial.

Disclosure of interest: No

2233

Long-term domain-specific cognitive impairment following stroke: The OX-CHRONIC study

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Background and aims: The prevalence of domain-specific function, as well as individual domain trajectories of impairment are not well characterized in long-term stroke survivors. This study aimed to determine the domain-specific cognitive trajectories at acute, 6-month and long-term (2-9 years) post stroke.

Methods: 866 stroke patients were recruited and received domain-specific cognitive screening acutely, 430 (49.7%) of which completed 6-month follow-up (T2). Of these, 208 consented to being re-contacted for further research. 105 participants were recruited to the OX-CHRONIC cohort study (REC Ref: 19/SC/0520). Descriptive statistics of prevalence and trajectories, and multivariate regression analyses on associations between acute, 6-month and chronic cognitive impairment are presented.

Results: 98 stroke survivors (Mean/SD age 68.7/12.9 years, 44.9% female, Mean/SD NIHSS 7.1/6.1 completed the Oxford Cognitive Screen (OCS) at all 3 timepoints. At final follow-up (mean 4.5 years), 41.8% were impaired on at least one OCS domain subtest. Deficits were found across all domains ranging from 8.2% impaired in memory to 14.3% in attention. Overall, 11.2% met all criteria for dementia. A greater severity of acute (β=0.201, *Adj* R^2=0.161) and 6-month (β=0.358, *Adj* R^2=0.159) cognitive impairment was associated with a greater severity of long-term cognitive impairment after adjusting for demographics, stroke characteristics, and vascular risk factors. From acute to final follow-up, 71% had a reduction in tasks impaired, 17% remained stable (mainly unimpaired), and 11% declined in function.

Conclusions: Domain-specific impairments remain prevalent, despite overall recovery in those continuing to follow up. Increased severity of

A summary of abstract 1330 and 2145 will be presented in session "Official Welcome and Large Clinical Trials" by Joanna Wardlaw

cognitive impairment early after stroke indicates potential increased severity of long-term impairment.
Disclosure of interest: No

2315

Predictors of acute ischemic cerebral lesions in immune-mediated thrombotic thrombocytopenic purpura and hemolytic uremic syndrome

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Background and aims: The immune form of Thrombotic thrombocytopenic purpura (iTTP) and the Hemolytic and Uremic Syndrome (HUS) are two major forms of thrombotic microangiopathy (TMA). The prevalence and predictors of cerebral lesions during the acute phase of iTTP and shigatoxin-producing Escherichia coli-HUS or atypical HUS were evaluated in a prospective multicenter study of TMA.
Methods: Univariate analysis was performed to report differences between patients with iTTP and those with HUS or between patients with acute cerebral lesions and the others. Multivariable logistic regression analysis was used to identify the potential predictors of these lesions.
Results: Among 73 TMA cases (46.89 $\pm$ 15.99 years) with iTTP (n = 57) or HUS (n= 16), one third presented with acute ischemic cerebral lesions on MRI, two individuals also had hemorrhagic lesions. One in ten patients had acute ischemic lesions without any neurological symptom. The neurological manifestations did not differ between iTTP and HUS. In multivariable analysis, 3 factors predicted the occurrence of acute ischemic lesions on cerebral MRI: 1) the presence of old infarcts on cerebral MRI, 2) the level of blood pulse pressure, 3) the diagnosis of iTTP.
Conclusions: Cerebral MRI is crucial to detect ischemic lesions at the acute phase of iTTP and HUS and helps identify patients with old infarcts, at the highest risk of neurological worsening. The diagnosis of iTTP further increases the risk of ischemic lesions but also increased blood pressure that may represent a potential target to improve therapeutic management of such conditions
Disclosure of interest: No

RISK FACTORS AND PREVENTION DAY 2

1277

THE JAK2V617F MUTATION IS COMMON IN ISCHEMIC STROKE

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Background and aims: The acquired gene mutation *JAK2V617F* is a risk factor for thrombosis in patients with the Philadelphia negative myeloproliferative neoplasms (MPN). Moreover, the mutation is present in 3.1% of the general population. However, whether the *JAK2V617F* mutation is a risk factor for thrombosis in the absence of MPN is uncertain. An increased *JAK2V617F* prevalence in a stroke population compared to the background prevalence would indicate such a link.
We aimed to investigate the prevalence of the *JAK2V617F* mutation in patients with Ischemic Stroke (IS), Transient Ischemic Attack (TIA), or Retinal Artery Occlusion (RAO).
Methods: We recruited 490 consecutive patients with IS, TIA, or RAO during admission at the Department of Neurology, Zealand University Hospital, Denmark. A blood sample was taken within 7 days of symptom onset and screened for the *JAK2V617F* mutation by the highly sensitive droplet digital PCR.
Results: Out of 490 patients, 51 (10.4%) had the *JAK2V617F* mutation. There was no significant difference regarding patient demographics, cardiovascular risk factors, or the presence of elevated blood cell levels between patients with and without the gene mutation.
Conclusions: The *JAK2V617F* prevalence in the stroke population is substantially higher compared to the background population (10.4% vs 3.1%). This supports the hypothesis that the *JAK2V617F* mutation is a thrombotic risk factor even in the absence of MPN. Indeed, it calls for further exploration into both the pathophysiological mechanisms and potential treatments to prevent future thrombotic events in these patients.
Disclosure of interest: No

1318

HIGH CARRIER FREQUENCY OF RNF213 p.R4810K VARIANT AMONG EARLY-ONSET ISCHEMIC STROKE PATIENTS

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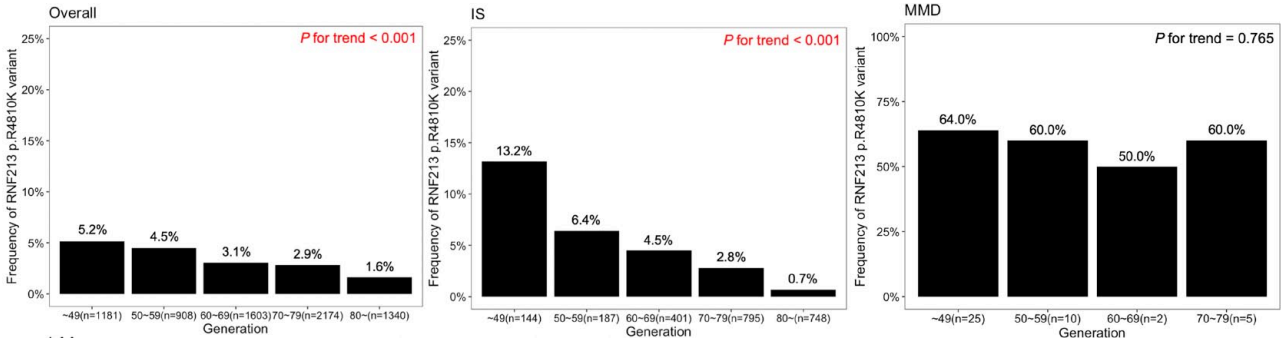
Background and aims: The moyamoya disease (MMD) susceptibility variant *RNF213* p.R4810K is frequently found in patients with early-onset ischemic stroke (IS); however, generational differences in the prevalence of this variant remain to be elucidated.
Methods: Among the participants in the NCVC BioBank, primarily comprising of patients with cerebrovascular and cardiovascular diseases between 2011 and 2021, only those evaluated for the *RNF213* p.R4810K variant were included and classified into 5 generation groups: $<$50, 50–59, 60–69, 70–79, and 80$\leqslant$ years of age. The carrier frequency of this variant in IS or MMD was investigated. The Cochran-Armitage test was used to analyze the trend of frequency of *RNF213* p.R4810K variant across generations.
Results: Among the 25846 participants in the NCVC BioBank, 7206 (median age, 69 years, female 63.8%) were included and the *RNF213* p.R4810K variant was detected in 235 (3.3%) with a higher carrier frequency among younger generations: $<$50 years, 5.2%; 50–59, 4.5%; 60–69, 3.1%; 70–79, 2.9%; 80$\leqslant$, 1.6% (*P* for trend $<$0.001). In IS patients (n=2275), this trend was more pronounced: $<$50 years, 13.2%; 50–59, 6.4%; 60–69, 4.5%; 70–79, 2.8%; 80$\leqslant$, 0.7% (*P* for trend $<$0.001). In MMD patients (n=42), the prevalence of this variant was similar across generations: $<$50 years, 64.0%; 50–59, 60.0%; 60–69, 50.0%; 70–79, 60.0% (*P* for trend=0.765).
Conclusions: The carrier frequency of the *RNF213* p.R4810K variant was observed to be more frequent among younger generations with IS compared to older generations.



Disclosure of interest: No

1366

Higher stroke recurrence and death in ischaemic stroke patients with known atrial fibrillation, compared to those with a first-diagnosis of atrial fibrillation: a cross-sectional study

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Background and aims: It is uncertain if the prognosis differs in patients who have atrial fibrillation (AF) detected for the first time after stroke (AFDAS) compared to patients who are previously known to have AF (KAF). We compared vascular risk-factor prevalence, risk of recurrent stroke/TIA, and mortality in patients with AFDAS compared to KAF after ischemic stroke (IS).

Methods: We analysed a UK prospective stroke registry from 2015-2019 at a hyperacute stroke center. Eligible patients had IS and AF. Data on comorbidities, possible competing stroke mechanisms other than AF, echocardiographic parameters, stroke/TIA recurrence and death at 3-years were collected.

Results: 370 patients (AFDAS 139, KAF 231) were included. AFDAS patients were younger (P=0.006), had a lower proportion of heart failure (P=0.04), ischaemic heart disease/vascular disease (P=0.0007); lower CHA_2DS_2-VASc scores (P=0.0004); and smaller left atrial area (P<0.0001) and left atrial volume (P=0.001).

A significantly larger proportion of KAF patients had recurrent IS, TIA or haemorrhagic stroke by 3-years (P=0.01) despite similar proportions anti-coagulated. More KAF died as inpatients (P=0.001) or by 3-years (P<0.0001) (Table 1).

A significantly smaller proportion of AFDAS patients had a competing aetiology to cardioembolism for their stroke (P=0.04). AFDAS patients were significantly less likely to have died by 3-years compared to KAF (OR (adjusted for CHA_2DS_2-VASc) 0.38 (0.24-0.58), P<0.0001).

Conclusions: KAF patients are a more complex cohort of patients compared to AFDAS and may need consideration of a multi-faceted approach to stroke prevention, outside of just anticoagulation.

Disclosure of interest: No

Table 1. AFDAS compared to KAF.

	AFDAS	KAF	P
n	139	231	-
Demographic details			
Median age (years, IQR)	82 (74-87)	85 (78-90)	0.006
Female (%)	74 (53)	123 (53)	1.00
Median NIHSS (IQR)	6 (3-14)	7 (3-16)	0.12
Vascular risk factors, n (%)			
Congestive Cardiac Failure	25 (18)	65 (28)	0.04
Hypertension	103 (74)	176 (76)	0.11
Diabetes	35 (25)	63 (24)	0.75
Ischaemic heart or vascular disease	17 (12)	56 (24)	0.0007
Hypercholesterolemia	73 (52)	121 (52)	0.98
Previous Stroke/TIA	38 (27)	89 (39)	0.04
Median CHA_2DS_2-VASc (IQR)	4 (3-5)	5 (4-6)	0.0004
Anticoagulated at discharge*	93 (74)	122 (70)	0.79
Competing stroke aetiology, n (%)			
Any competing other aetiology	18 (13)	53 (23)	0.04
Any ipsilateral atheroma	73 (53)	107 (46)	0.30
Ipsilateral atheroma >50% stenosis	9 (6.5)	25 (11)	0.22
Any contralateral atheroma	64 (46)	91 (39)	0.25
Contralateral atheroma >50% stenosis	6 (4)	16 (6)	0.42
Clinical lacunar stroke	19 (14)	40 (17)	0.43
Echo parameters			
Echocardiogram completed n (%)	50 (36)	89 (39)	-
Median left atrial area (cm^2)	22 (17-26)	27 (22-33)	<0.0001
Median left atrial volume (mL/m^2)	40 (30-51)	52 (37-76)	0.001
Event Recurrence			
Myocardial Infarction at 6 months	0	0	-
Myocardial Infarction at 6-12 months	0	0	-
Myocardial Infarction at 1-3 years	3	0	-
IS/TIA at 6 months	0	3	-
IS/TIA at 6-12 months	0	0	-
IS/TIA at 1-3 years	0	7	-
Haemorrhagic stroke at 6 months	0	1	-
Haemorrhagic stroke at 6-12 months	0	0	-
Haemorrhagic stroke at 1-3 years	0	2	-
Total any stroke or TIA by 3 years	0	12	0.01
Died as inpatient or palliative discharge	14 (10)	56 (24)	0.001
Died within 1 year	19 (14)	36 (16)	0.73
Died within 3 years	49 (35)	134 (58)	<0.0001

*Excluding inpatient deaths.

1455

ASSOCIATION BETWEEN HYPERTENSION AND CRYPTOGENIC ISCHEMIC STROKE IN YOUNG ADULTS

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Alessandro Pezzini[12], Petra Redfors[13], Kristina Ryliskiene[6], Sahrai Saeed[14], Tomi Sarkanen[15], Mine Sezgin[16], Turgut Tatlisumak[13], Georgios Tsivgoulis[17], Lauri Tulkki[1], Esme Ekizoglu[16], Ulrike Waje-Andreassen[18], Nilufer Yesilot[16], Pauli Ylikotila[19], Marialuisa Zedde[20], Nicolas Martinez-Majander[1]
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Background and aims: Underlying risk factors for young-onset cryptogenic ischemic stroke (CIS) remain understudied. In the SECRETO Study (Searching for Explanations for Cryptogenic Stroke in the Young: Revealing the Etiology, Triggers, and Outcome) we aimed to assess the association between hypertension and CIS, with subgroup analyses stratified by sex and age.
Methods: We prospectively enrolled 509 patients aged 18-49 years (median age 41 years; 47% women) with a recent CIS and 509 age- and sex-matched (±5 years) stroke-free controls. Hypertension was defined as either prior diagnosis of hypertension, use of antihypertensive medication prior to stroke, or systolic blood pressure at least 140 mmHg or diastolic blood pressure at least 90 mmHg at baseline visit. We used conditional logistic regression adjusting for age, education, any cardiovascular disease, diabetes, current smoking, obesity, heavy alcohol consumption, and physical inactivity to assess independent association between hypertension and CIS.
Results: Patients had more frequently history of hypertension compared to controls, and they were more often overweight, current smokers, heavy alcohol users, and physically inactive. In the entire cohort, hypertension was independently associated with CIS (adjusted odds ratio [aOR] 2.45, 95% confidence interval [CI] 1.56-3.86). In sex- and age-specific analyses, hypertension was independently associated with CIS especially in older patients ⩾41 years (for men aOR 3.12, 95% CI 1.34-7.26 and for women aOR 3.11, 95% CI 1.31-7.40) but not in younger patients.
Conclusions: Hypertension seems to be strongly associated with young-onset CIS in slightly older patients, both men and women.
Disclosure of interest: No

1573

HYPERTHYREODISM IS ASSOCIATED WITH CARDIOEMBOLIC STROKE ETIOLOGY MEDIATED BY ATRIAL FIBRILLATION: RESULTS FROM THE BIOSIGNAL STUDY

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Background and aims: We aimed to investigate the association of thyreoid stimulating hormone (TSH) with cardioembolic stroke etiology (CES) and analyze to which extend the effect of hyperthyroidism on CES is attributable to atrial fibrillation (AF)
Methods: The BIOSIGNAL-study is a multicenter, prospective cohort study that included acute ischemic stroke (AIS) patients. TSH levels were measured within the first 24 hours of symptom onset. Stroke etiology was classified according to TOAST criteria. Patients were categorized as hyperthyroid using the standard TSH-cutoff of <0.33 mU/L. We used a mediation analysis framework to estimate the total, direct, and indirect effects of hyperthyroidism on (CES), with AF as the mediator variable. Bootstrapping was used to estimate the standard error and 95% confidence interval for the indirect effect
Results: Of 1,730 AIS patients, 78 (4.5%) were hyperthyroid. Hyperthyroid patients were more likely to have a CES (48.1% vs. 32.4%, p=0.004; Table 1) and a history of AF (41.0% vs. 24.9%, p=0.001) . For the effects of hyperthyroidism on CES, results were significant for the total effect (coefficient: 0.143, p=0.008) and the indirect effect (coefficient: 0.085 [bootstrap 95% CI: 0.018-0.152], p=0.006; Table 2), but not for the direct effect (p=0.193). This indicates the presence of a full indirect mediation with approximately 59% of the total effect of hyperthyroidism on CES being mediated by AF (ratio of indirect to total effect: 0.594)
Conclusions: Our findings suggest that in patients with AIS, the association of hyperthyroidism with CES was mainly mediated by the presence of atrial fibrillation.

Figure 1. Generic direct acyclic graph illustrating the applied mediation analysis framework: Indirect effect (i.e. mediated) of TSH on cardioembolic stroke via pathways a and b. Direct effect (i.e. not mediated by atrial fibrillation) of TSH on cardioembolic stroke via pathway c'.

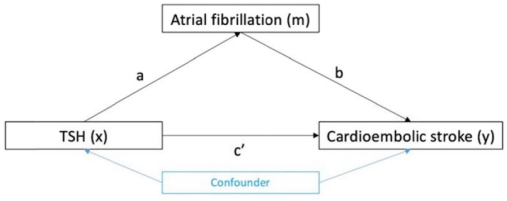

Table 1. Baseline characteristics of ischemic stroke patients stratified by hyperthyreoidism (defined by a TSH-threshold: <0.33 mU/L).

	All	Hyperthyroid*		P value
		Yes (N=78)	No (N=1,652)	
No. (%)	1,730 (100.0)	78 (4.5)	1,652 (95.5)	
Demographics				
Age (yr) – median [IQR]	74.0 [64.0-82.0]	78.0 [68.0-83.0]	74.0 [63.0-82.0]	0.12
Female – no. (%)	721 (41.7)	41 (52.6)	680 (41.2)	**0.046**
Admission characteristics & medical history				
NIHSS score at admission – median [IQR]	5.0 [2.0-11.0]	7.0 [4.0-15.0]	5.0 [2.0-11.0]	**0.002**
Premorbid mRS score – median [IQR]	0.0 [0.0-1.0]	0.0 [0.0-2.0]	0.0 [0.0-1.0]	**<0.001**
Previous ischemic stroke – no. (%)	294 (17.0)	20 (25.6)	274 (16.6)	**0.04**
Previous transient ischemic attack – no. (%)	131 (7.6)	4 (5.1)	127 (7.7)	**0.40**
Previous intracranial hemorrhage – no. (%)	32 (1.9)	1 (1.3)	31 (1.9)	0.70
Atrial fibrillation – no. (%)	443 (25.6)	32 (41.0)	411 (24.9)	**0.001**
Coronary heart disease – no. (%)	354 (20.5)	25 (32.1)	329 (20.0)	**0.01**
Congestive heart failure – no. (%)	110 (6.4)	8 (10.3)	102 (6.2)	0.15
Myocardial infarction – no. (%)	171 (9.9)	9 (11.5)	162 (9.8)	0.62
Diabetes – no. (%)	293 (16.9)	15 (19.2)	278 (16.8)	0.58
Hypertension – no. (%)	1,260 (72.9)	63 (80.8)	1,197 (72.5)	0.11
Dyslipidemia – no. (%)	1,185 (68.5)	51 (65.4)	1,134 (68.7)	0.54
Smoking – no. (%)	384 (22.5)	16 (21.1)	368 (22.5)	0.76
Alcohol abuse – no. (%)	99 (5.9)	3 (4.1)	96 (5.9)	0.50
Chronic pulmonary disease – no. (%)	129 (7.5)	6 (7.7)	123 (7.5)	0.94
Etiological stroke classification				
TOAST				
Large artery atherosclerosis	251 (14.5)	9 (11.7)	242 (14.7)	0.47
Cardioembolic	572 (33.1)	37 (48.1)	535 (32.4)	**0.004**
Small vessel disease	181 (10.5)	8 (10.4)	173 (10.5)	0.98
Other determined etiology	90 (5.2)	1 (1.3)	89 (5.4)	0.11
Unknown etiology	635 (36.7)	22 (28.6)	613 (37.1)	0.13

* hyperthyroidism: defined using the standard TSH-cutoff of <0.33 mU/L

Table 2. Mediation analysis results.

Total effect (TSH→CES)			Direct effect (TSH→CES)			Indirect effect (TSH→AFIB→CES)				
Coefficient	*SE*	*p value*	*Coefficient*	*SE*	*p value*	*Coefficient*	*Bootstrap SE*	*p value*	*Bootstrap 95%CI*	
									Lower	Upper
0.143	0.054	0.008*	0.058	0.045	0.193	0.085	0.034	0.006*	0.018	0.152

TSH: thyreoid stimulating hormone (dichotomized using the threshold for hyperthyreosis [<0.33 mU/L vs ≥0.33 mU/L]), CES: cardioembolic stroke etiology (according to the TOAST classification), AFIB: positive history for atrial fibrillation, SE: standard error, CI: confidence interval. Models were adjusted for age and sex.

Disclosure of interest: No

1767

Drug-eluting stents versus bare-metal stents for intracranial atherosclerotic stenosis: a systematic review and meta-analysis

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Background and aims: In-stent restenosis (ISR) is the main cause of stroke recurrence after intracranial stenting. Recently, drug-eluting stent (DES) has shown its great potential in reducing restenosis. This systematic review aimed to evaluate the efficacy and safety of DES compared to bare-metal stent (BMS) for intracranial atherosclerotic stenosis (ICAS).
Methods: We systematically searched MEDLINE, CENTRAL, EMBASE, and Web of Science for randomized controlled trials (RCTs) and prospective cohorts comparing DES with BMS in the treatment of symptomatic severe ICAS before July 04, 2022. Safety and efficacy evaluations were divided into short-term and long-term outcomes. Fixed or random effects model were employed to pool data respectively.
Results: A total of 510 participants were enrolled from 4 trials fulfilling all eligible criteria. DES was as safe and efficiency as BMS in short term, and probably safer in long term, with a lower rate of stroke recurrent within 1 year (3 trials, 436 participants, RR 0.46, 95% CI 0.24 to 0.88, P=0.02). It was manifested that DES group had a significantly lower rate of ISR (4 trials, 429 participants, RR 0.23, 95% CI 0.13 to 0.41, P<0.001), as well as less luminal narrowing (2 trials, 233 participants, MD -14.45, 95% CI -26.77 to -2.13, P=0.02) within 1 year.
Conclusions: This review demonstrated that the application of DES for intracranial stenting was safe and efficient, and could significantly reduce the rate of ISR and recurrent ischemic events. More researches in the future are deserved to be conducted to support these results.
Disclosure of interest: No

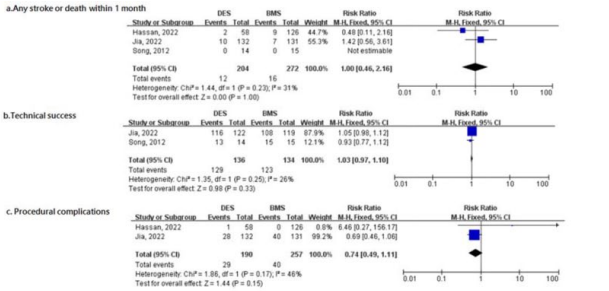

Fig.1 Short-term Outcomes (follow-up <1month). We analyzed the safety and efficacy of DES in any stroke or death within 1 month (a), technical success (b) and procedural complications (c). DES: drug-eluting stent; BMS: bare-metal stent.

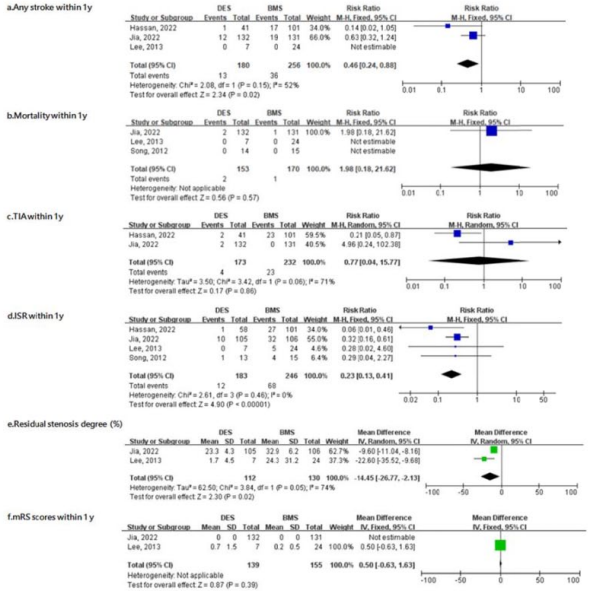

Figure 2 Long-term outcomes (follow-up > 1month). The rates of any stroke (a), mortality (b) and TIA (c) within 1 year were analyzed respectively. Forest plots comparing restenosis between DES and BMS were showed in (d) and (e). Long-term functional outcome was evaluated by mRS scores (f). TIA: transient ischemic attacks; ISR: in-stent restenosis; DES: drug-eluting stent; BMS: bare-metal stent; mRS: modified Rankin Scale.

2041

COMBINED INFLAMMATORY BIOMARKERS PREDICT RECURRENT IPSILATERAL ISCHAEMIC STROKE

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Background and aims: Inflammation is important in the development and rupture of carotid plaque. It remains unknown if inflammatory blood-biomarkers can improve identification of patients with carotid stenosis at high-risk of stroke recurrence.
Methods: We pooled three prospective cohort studies. Included patients had recent non-severe ischaemic stroke/TIA and ipsilateral internal carotid stenosis (CS). Blood hsCRP and IL-6 were measured using immunochemiluminescence and dichotomised at 2mg/L (hsCRP) and 7pg/ml (IL-6, expected-normal). The primary outcome was recurrent ipsilateral IS. Cox regression with stepwise-backwards adjustment was performed, with variables removed at p⩾0.2.
Results: Of 269 stroke/TIA participants, 130 (48.3%) had severe CS (median age, 71 (IQR 64-78)). There were 19 post-phlebotomy ipsilateral recurrent IS in 1,046-patient-years follow-up (median 3.9 years (IQR 1.6-5.8)).
187 (69.5%) had hsCRP⩾2mg/L and 170 (63.2%) had IL-6⩾7pg/ml. 146 (54.3%) had both hsCRP⩾2mg/L and IL-6⩾7pg/ml.
On unadjusted Cox regression, hsCRP⩾2mg/L was associated with recurrent IS (HR 8.82, CI 1.2-66.2, p=0.03) with a trend for IL-6⩾7pg/ml (HR 3.14, CI 0.91-10.7, p=0.07.) Combined high-hsCRP/IL-6 was associated with recurrent IS (HR 4.76, CI 1.38-16.34, p=0.01).
On stepwise Cox regression, adjustment covariates were prior stroke/TIA, diabetes mellitus and time-to-phlebotomy. After adjustment, trends remained for hsCRP⩾2mg/L and IL-6⩾7pg/ml individually (hsCRP HR 7.04, CI 0.93-53.4, p=0.059; IL-6 HR 2.67, 0.77-9.3, p=0.12). However, combined hsCRP/IL-6 independently predicted recurrent stroke (HR 3.72, CI 1.07-13.0, p=0.039).
The c-statistic for combined raised hsCRP/IL-6 was 0.66 (CI 0.57-0.75).
Conclusions: The combination of high hsCRP/IL-6 predicted recurrent IS with better accuracy than established risk factors or either biomarker alone in recently-symptomatic CS.
Disclosure of interest: Yes

2197

Risk of Stroke, Coronary Heart Disease and Congestive Heart Failure following Transient Ischemic Attacks in the Community-the Framingham Heart Study

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Background and aims: The association between Transient ischemic attack (TIA) and stroke is well-established; the risk of non-cerebral cardiovascular events is less well described. We report the risk of stroke, coronary heart disease (CHD) and congestive heart failure (CHF) post-TIA in the Framingham Heart Study (FHS) cohort.
Methods: Longitudinal follow-up (1948-2017) of FHS participants with TIA, CHD- and stroke-free at age 35-94. Each TIA was randomly assigned 3 age- and gender-matched stroke/CHD-free controls. Cox models were used to examine 10-year risk of subsequent stroke, CHD (coronary death or myocardial infarction), CHD+angina or CHF.
Results: 286 participants (170 women, 73.1±10.8 years) with a first-ever TIA were identified; over 9.5±8.1 years of follow-up 83 (29%) experienced stroke, 35 (12%) CHD, 54 (19%) CHD+angina and 37 (13%) developed CHF. Compared to controls, persons with TIA had a 4-fold higher stroke risk [HR 4.01 95% CI(2.73-5.87), p<0.0001] but also 54% higher risk of CHD+angina [HR 1.55, 95% CI(1.06-2.28), p<0.03], 45% higher risk of CHD [HR 1.45, 95% CI(0.90-2.36), p=0.13] and 36% higher risk of CHF [HR 1.36, 95% CI(0.88-2.11), p=0.17] adjusting for age, sex, education level, hypertension, diabetes, atrial fibrillation, and smoking.
Conclusions: In addition to higher stroke risk, TIA patients are at significantly higher risk of subsequent CHD compared to the general population. Our findings suggest that TIA should not be viewed as a strictly cerebrovascular problem, but as herald of subsequent overall cardiovascular risk beyond stroke and highlight the need for both early intervention and continued surveillance in this high-risk patient population.
Disclosure of interest: No

2229

Timing of Stroke and non-Stroke cardiovascular outcomes following Transient Ischemic Attacks in the Community-the Framingham Heart Study

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Background and aims: Early stroke risk is a well-established complication following Transient ischemic attack (TIA); the occurrence and timing of non-cerebral cardiovascular events is less well described. We report the timing of stroke, coronary heart disease (CHD) and congestive heart failure (CHF) post-TIA in the Framingham Heart Study (FHS) cohort.
Methods: Longitudinal follow-up (1948-2017) of FHS participants with TIA, CHD- and stroke-free at age 35-94. We examined the risk of stroke, CHD (coronary death or myocardial infarction), CHD+angina or CHF stratified by time: early (0-3 months), intermediate (4-12 months) and late (>12 months).
Results: 286 participants (170 women, 73.1±10.8 years) with a first-ever TIA were identified; over 9.5±8.1 years of follow-up 83 (29%) experienced stroke, 35 (12%) CHD, 54 (19%) CHD+angina and 37 (13%) developed CHF. Strokes were significantly more likely to occur early: 35/83(42%) vs 3/35(9%) CHD, 5/54(9%) CHD+angina and 3/37 (8%), p=0.0001. Outcome rates beyond 12 months were comparable: 40/286 (14%) experienced a stroke, 29/286 (10%) had CHD, 44/286 (15%) CHD+angina and 27/286 (9%) developed CHF, p=0.08.
Conclusions: TIA patients are at risk for both stroke and non-stroke cardiovascular events. Our findings suggest that stroke risk is early while non-stroke cardiovascular events occur in a delayed fashion. Although focus on stroke prevention is warranted in the early post-TIA period, cardiac outcomes are equally possible beyond 12 months highlighting the need for continued global surveillance and attention to overall cardiovascular health in this patient population.
Disclosure of interest: No

2374

RNF213 p.R4810K Variant as a Risk Gene for Polyvascular Disease

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Background and aims: The p.R4810K *RNF*213 variant, a susceptibility gene for moyamoya disease, is associated with systemic vascular diseases such as intracranial/extracranial, coronary, pulmonary, or peripheral arteries. We investigated the association between the variant and polyvascular disease (PVD).
Methods: Among 25846 participants in the NCVC BioBank between 2011 and 2021, those evaluated for the *RNF213* p.R4810K variant (n=7206) were included. PVD was defined as the presence of vascular disease in ⩾2 following arterial beds: intracranial/extracranial artery, coronary artery, pulmonary artery, renal artery, peripheral artery, and the aorta. Vasculitis (n=21), Burger disease (n=16), and vascular diseases due to other genetic variants including Marfan syndrome (n=85), Fabry disease (n=4), and CADASIL (n=6) were excluded. The association between the carriage of the variant and PVD was analyzed using multiple logistic regression models, adjusting for demographics and vascular risk factors.
Results: Among 7074 participants (median age, 69 years; female 63.9%), the *RNF213* p.R4810K variant was identified in 234 (3.3%). The variant carriers were younger (median age, 63 vs. 69 years, $P<0.001$), and more frequently female (47.9% vs. 35.7%, $P<0.001$) than non-carriers. The carriage of the variant was significantly associated with intracranial/extracranial artery disease (n=1406; OR, 4.62 [95% CI, 2.72–7.84], $P<0.001$), coronary artery disease (n=1117; OR, 1.95 [95% CI, 1.18–3.22], $P=0.009$), and peripheral artery disease (n=207; OR, 2.75 [95% CI, 1.25–6.02], $P=0.012$). The variant also demonstrated a significant association with PVD (n=569; OR, 2.25 [95% CI, 1.17–4.34], $P=0.015$).
Conclusions: The *RNF213* p.R4810K variant could confer risk for PVD.
Disclosure of interest: No

2454

The burden of cancer in the Danish stroke population. Comparison with the Danish background population without stroke

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Background and aims: Stroke and cancer share risk factors contributing to greater cancer burden in the stroke population. We studied the cancer burden in the Danish stroke population with comparison to the background population (BP) without stroke.
Methods: All patients with incident stroke in Denmark 2003-2015 were identified through the Danish Stroke Registry (n=85893) and matched 1:10 on age/sex to the Danish BP without history of stroke (n=858740). Linking to the Danish Cancer Registry, we identified events of previously unknown cancer during a one-year follow-up in the stroke and BP. We stratified cancers into all-cancers and cancers related to/unrelated to smoking. We determined rate of identification per 1000 person-years (RI) of cancers in the first month after stroke (when patients are in hospital) and in the 4th-12th months (when patients are discharged from hospital).
Results: *All-cancers*: In the first month RI was 69.6/18.6 (stroke/BP); 3.7 greater in the stroke population. In the 4th-12th months RI was 20.1/18.0 (stroke/BP); 1.1 greater in the stroke population. *Smoking related cancers*: 1st month RI was 33.1/8.5 (stroke/BP); 3.9 greater in the stroke population. 4th-12th months RI was 9.7/8.0 (stroke/BP); 1.2 greater in the stroke population. *Cancers unrelated to smoking*: 1st month RI was 10.5/6.3 (stroke/BP); 1.7 greater in the stroke population. 4th-12th months RI was 5.5/6.2 (stroke/background); now 1.1 greater in the background population.
Conclusions: The stroke population generally has greater cancer burden, which however manifests itself differently depending on type of cancer and where in the course of the stroke it is measured.
Disclosure of interest: No

SERVICE ORGANISATION DAY 2

1346

SEX-DIFFERENCES IN ACCESS TO STROKE DIAGNOSTICS, TREATMENT, AND REHABILITATION

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[1]*Bispebjerg and Frederiksberg Hospital, Department of Neurology, Copenhagen, Denmark*

Background and aims: Reports on sex-differences in access to stroke care remain conflicting. We aimed to investigate sex-differences in diagnostics, treatment, and rehabilitation in a population-based study.
Methods: Based on aggregate data (SlicerDicer tool in Epic© electronic health record platform) we identified all patients admitted with a stroke (DI63, DI61, DI64, DG45.8, DG45.9) in two Danish regions comprising 46% of the Danish population) from May 2016 until October 15th, 2022. We dichotomized by legal gender, and calculated odds ratios for diagnostics, treatment, and rehabilitation.
Results: A total of 28.855 patients were identified (55.22% men and 44.78% women). Women were less likely to have MRi (odds ratio (OR): 0.9, p <0.001), CT angiography (OR: 0.88, p <0.001), ultrasound of carotids (OR: 0.85, p <0.001), echocardiography (OR: 0.7, p <0.001), and cardiac monitoring (OR: 0.9, p <0.001), while use of non-contrast CT was equal. Women were less likely to receive intravenous thrombolysis (OR 0.83, p <0.001); access to mechanical thrombectomy or intensive care unit was equal.
Women were less frequently referred to neuropsychological examination (OR: 0.55, p <0.001), while no differences were present in dysphagia screening, evaluation by therapists, or referral to community rehabilitation. Findings were confirmed in the above median age population.
Conclusions: Sex-differences in access to care were present and were not just related to older age of women. No or less pronounced differences were observed in basic interventions that are monitored as process indicators in the national quality program.
Disclosure of interest: No

1540

Impact of successive COVID-19 lockdowns on specialist stroke access in the UK: data from the national stroke registry

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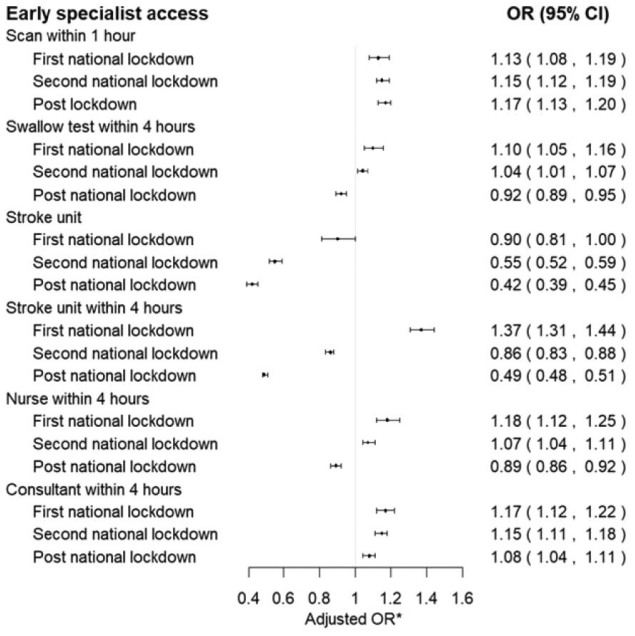
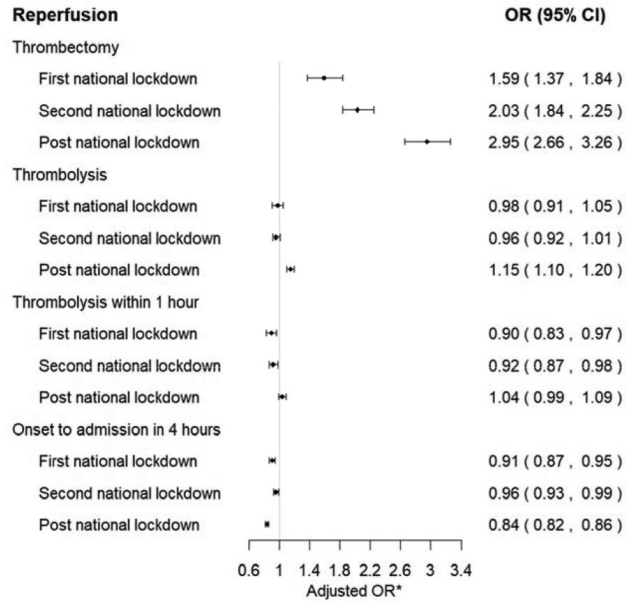
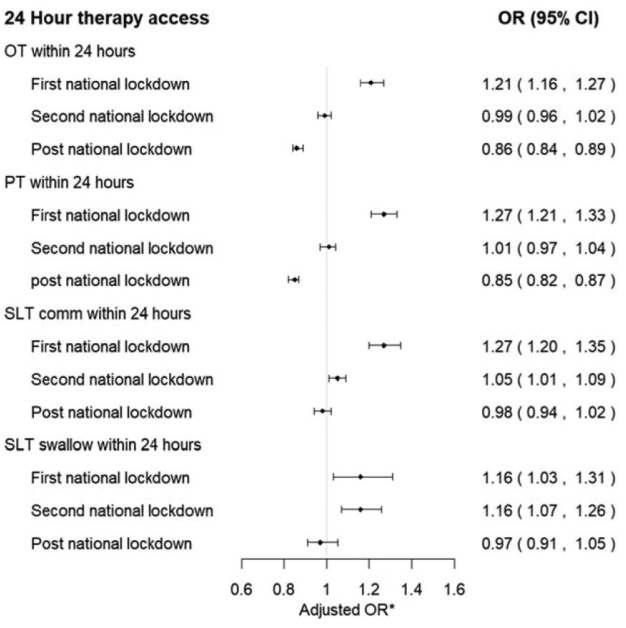
Background and aims: Recurrent 'waves' of COVID-19 in the UK during 2020-22 imposed significant pressure on emergency services, including for stroke. We sought to understand the impact of COVID-19 on specialist stroke access since the first lockdown.
Methods: Data were extracted from the Sentinel Stroke National Audit Programme (the national stroke registry for the UK) for comparable periods from 29/01/2017 to 30/06/2022. Odds ratios were calculated for a range of care quality indicators during UK national lockdowns and the post-lockdown period, compared with matching periods during pre-pandemic years using logistic regression and adjusted for case-mix.
Results: 333,733 patients were admitted over five years since 2017, with 186,154 patients during pre-pandemic reference period, 16,843 during

first lockdown, 48,004 second lockdown, and 82,732 during the post-lockdown period. After adjustment for casemix, the relative likelihood of imaging within 1 hour increased from pre-pandemic for first, second lockdown and post-lockdown periods (13%, 15% and 17% respectively). All other specialist access and 24-hour therapy treatments showed an increase in attainment during first lockdown, with the rates decreasing in subsequent time periods. Compared to pre-pandemic, patients had a 59% (OR: 1.59; 95% CI:1.37 – 1.84) increased odds of receiving thrombectomy during first lockdown, a 103% (OR: 2.03; 95% CI:1.84 – 2.25) higher odds during the second lockdown, and 195% (OR: 2.95; 95% CI:2.66 – 3.26) increased odds in the post-lockdown period.

Conclusions: Sustained decline was observed in many aspects of access to stroke care after the first COVID-19 lockdown in the UK, whereas thrombectomy use continued to increase markedly.







Disclosure of interest: No

1884

What would other emergency stroke teams do? Using explainable machine learning to understand variation in thrombolysis practice

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Background and aims: There remains substantial between-hospital variation in thrombolysis use among patients in England and Wales who arrive at hospital within 4 hours of known stroke onset. Thrombolysis use (2016-2018) in these patients varied 7-fold from 7% to 49% between hospitals.

Methods: An XGBoost (eXtreme Gradient Boosting) machine learning model, coupled with a SHAP (SHapley Additive exPlanations) explainability model, was used to predict which patients would receive thrombolysis at each hospital, and to assess the contribution of patient characteristics to the odds of receiving thrombolysis. The model was based on 88,928 patients arriving within 4 hours of known stroke onset at all 132 emergency stroke units in England and Wales, as recorded in the national stroke audit, SSNAP.

Results: The model revealed that the odds of receiving thrombolysis reduced 20-fold over the first 100 minutes of arrival-to-scan time, varied 30-fold depending on stroke severity, reduced 3-fold with imprecise onset time, fell 5-fold with increasing pre-stroke disability, and varied 15-fold between hospitals. The hospital identification (hospital SHAP value) explained 58% of the variance in between-hospital thrombolysis use. Compared with hospitals with higher thrombolysis use, hospitals with lower use were particularly less likely to give thrombolysis to patients with milder strokes, prior disability, or patients with imprecise onset time.

Conclusions: Using explainable machine learning, we have identified that the majority of the between-hospital variation in thrombolysis use in England and Wales may be explained not by casemix but by differences in hospital predisposition to use thrombolysis.

Disclosure of interest: No

1924

Stroke nurse plays a key role reducing time delays, achieving rapid BP target and decreasing BP variability in patients with acute ICH

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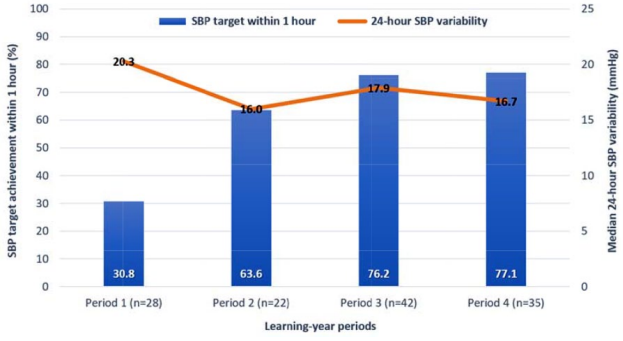
Background and aims: There is no consensus about best strategy to achieve BP control in acute ICH. We aimed to assess the impact of the stroke nurse (SN) in the learning implementation of a rapid-intensive-sustained BP protocol on time targets and BP variability in acute ICH.

Methods: Retrospective analysis of prospectively collected data of 127 consecutive ICH patients <6 hours and SBP >150 mmHg during 4 learning-year periods. BP was managed under a rapid (antihypertensive IV bolus by a SN at CT scan), intensive (SBP target <140 mmHg within 1 hour after bolus), and sustained (antihypertensive continuous infusion after bolus) 24-hour protocol. BP was recorded regularly every 15 (0-6 hours), 30 (6-12 hours), or 60 (12-24 hours) minutes. Yearly changes were made: 1st, SN at CT; 2nd, SN leading antihypertensive adjustment; 3rd, incorporation of an advance practice SN to stroke team; and 4th, retrainings. SBP target achievement within 1 hour (primary outcome), time metrics, and 24-hour SBP variability were recorded.

Results: Time from CT scan to bolus (14 [7-33], 13 [6-22], 8 [4-10], and 7 [4-14] minutes, *P*=0.043) and from bolus to target achievement (120 [50-240], 48 [25-68], 54 [35-60], and 41 [20-60] minutes; *P*<0.001) decreased over four learning-year periods, respectively. The frequency of SBP target achievement within first hour increased from 30.8% to 77.1% throughout periods (Figure, *P*<0.001) while 24-hour SBP variability decreased (Figure, *P*=0.018).

Conclusions: Stroke nurse plays a key role in reducing time delays, achieving rapid BP target, and decreasing BP variability in patients with acute ICH.



Disclosure of interest: No

2063

NORAHOME: A VIRTUAL STROKE MULTIMODAL HOME HOSPITALIZATION MONITORING PROGRAM FOR TIA AND MINOR STROKES

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Background and aims: The risk of early stroke recurrence is higher in with previous TIA or minor stroke. Currently, patients are either admitted in an acute stroke unit (increased costs and risks of hospitalization) or quickly evaluated in TIA clinics, (incomplete diagnostic workup and sub-optimal hemodynamic monitoring). We aimed to explore the impact of a virtual multimodal home hospitalization monitoring program (NORAHOME) for TIA or minor strokes, as an efficient strategy to optimize secondary stroke prevention

Methods: A prospective cohort study of consecutive patients with a suspected TIA or minor stroke admitted at the emergency room of a tertiary hospital between December 2020 and June 2022, who completed NORAHOME program (remote clinical and multimodal hemodynamic monitoring, nudged-based treatment adherence, virtual RHB and education program) was compared with a historic age- and gender-matched controls with TIA or minor stroke on Routine Clinical Practice between June and November 2020.

Results: 430 patient cases were analyzed, 215 patients in the prospective group were compared with 215 matched controls. Mean age 75.21±12.6y/54.9% women. Stroke recurrence rate at 3 months was 3-fold lower in the NORAHOME group (2.3%) compared to control group (2.3% vs6.5% p=0.03). Similarly, 3-month mortality rate was lower in the NORAHOME group (2.8% vs7%, p= 0.04). No significant differences were found in the rate of hospital readmission or functional outcome between the groups.

Conclusions: In our series of TIA and minor strokes, NORAHOME seems to be a safe and potentially effective strategy for preventing early stroke recurrence and optimize secondary stroke prevention.

Disclosure of interest: No

2207

OFF-LABEL PRESCRIPTION IN STROKE: COMPARATIVE ANALYSIS OF THE RECOMMENDATIONS OF THE EUROPEAN STROKE ORGANIZATION AND INDICATIONS APPROVED BY THE EUROPEAN MEDICINES REGULATORY AGENCIES

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Background and aims: Off-label use of drugs is part of medical practice, but it is associated with ethical and scientific issues. Several treatment guidelines from the European Stroke Organization (ESO) were recently published.
We aimed to quantify the recommendations with off-label use of drugs in the ESO guidelines and their quality of evidence
Methods: Methods: A descriptive study was developed. We included ESO guidelines, published between March 2016 to October 2022, in the "International Journal of Stroke" and "European Stroke Journal". Each guideline article is composed of several recommendations. Drugs identified in each recommendation were registered. The most recent summary of product characteristics of each drug was searched on the website of the "European Medicines Agency" or "Heads of Medicines Agencies" or "Electronic Medicines Compendium" in case of drugs not centrally approved. The number of off-label recommendations and the quality of evidence according to the GRADE criteria was quantified.
Results: Of 23 guideline articles published, 16 had pharmacological recommendations, totaling 72 recommendations. Among these articles, 87.5% had at least one pharmacological recommendation not approved by the EMA/HMA/EMC. In total, 69.4% of the pharmacological recommendations referred to an off-label use. Most of the "off-label" use recommendations were based on a very low or low (66%) quality of evidence.
Conclusions: Most pharmacological recommendations of the ESO guidelines include an off-label use of drugs. There is an association between the use of older drugs and off-label use. Patent loss may decrease the interest of companies in funding studies to evaluate new therapeutic indications.
Disclosure of interest: No

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Endovascular thrombectomy with or without bridging thrombolysis in patients with acute ischemic stroke: A cost-utility analysis

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Background and aims: There is clinical equipoise behind bridging intravenous thrombolysis (BT) with endovascular thrombectomy (EVT).
Methods: We conducted a model-based cost-utility analysis comparing the cost-effectiveness of EVT alone vs. BT for patients with acute ischemic stroke. Subsequently, we developed a Markov state transition model to assess the costs and outcomes over 1-year, 5-year, and 20-year time horizons. We considered the impact of disability and recurrent stroke on mortality risk, health-related quality of life, and costs. We estimated total and incremental cost, quality-adjusted life years (QALYs), and incremental cost-effectiveness ratio (ICER), expressed as an incremental cost per QALY gained of BT compared with EVT alone. Probabilistic analysis was used to calculate the reference case estimates.
Results: The average costs per patient were estimated to be $55,503, $57,814, $68,183, and $84,946 for BT, and $47,311, $49,556, $59,625, and $75,898 for EVT only over 90-day, 1-year, 5-year, and 20-year, respectively. The cost saving of EVT only strategy was driven by the avoided medication costs of IVT (ranging from $8,193 to $9,048). The additional thrombolytics led to slight decrease in QALY estimate during the 90-day time horizon (loss of 0.0016 QALY), but a small gain over 1-year, 5-year, and 20-year time horizons (0.0108, 0.0638, and 0.1481 QALY). With similar outcomes and less cost, the EVT only strategy was cost-effective compared with BT.
Conclusions: Our cost-effectiveness model suggested that bridging with thrombolytics may not be cost-effective for patients with acute ischemic stroke secondary to large vessel occlusion.
Disclosure of interest: No

2439

Patterns of clustering of vascular patients and its association with multiple long term conditions and risk factors

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Background and aims: Cardiovascular diseases, the main cause for morbidity and mortality worldwide presents a public health challenge and there is a need to investigate the underlying causes of such conditions to apply preventative measures. We aim to map the long-term condition clusters within vascular patients to understand this.
Methods: Data was extracted from Lambeth DataNet, a south London general practice database from 01/04/2005 to 13/04/2021. Patients with myocardial infarction and stroke were defined as vascular patients with latent class analysis performed on 32 long term conditions to identify disease clusters.
Results: Of 856,328 patients, 14,228 had at least one recorded vascular event, including 8,805 stroke patients. Three clusters were identified with C1: 4,771, C2: 4,853, C3: 4,576. C1 and C3 had the fewest myocardial infarction (11% and 2%) whereas they had the highest proportion of stroke patients (100% in both clusters). C1 had the highest median age of 85 years overall, 72 for stroke and 66 for myocardial infarction. C1 had the highest median number of multiple long-term conditions (7, IQR: 6–8) in comparison to C2 (3, IQR:5–7) and C3 (7, IQR:6–8). Most prevalent conditions in C1 were stroke (100%), chronic pain (86%), hypertension (85%). C1 had the highest prevalent deprivation (70%), and people with severe frailty (43%).
Conclusions: There are clear paths and clusters of multiple long-term conditions which can be used to identify patients with the underlying conditions for which adding preventative measures to treatment pathways could reduce burden of vascular diseases.
Disclosure of interest: No

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TIME OF DAY OF ENDOVASCULAR TREATMENT MODULATES CLINICAL OUTCOME AFTER STROKE

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Background and aims: Experimental stroke studies suggest a strong influence of the time-of-day of treatment on outcome and treatment efficacy. Whether this translates to human stroke is uncertain but could influence the selection of patients for treatments.
Methods: We leveraged data from 9,357 patients with large-vessel-occlusion from the German Stroke Registry to determine whether the time-of-day of endovascular treatment (i.e. flow restoration) modulates clinical outcomes and the benefit from successful recanalization. The primary end point was the distribution of modified Rankin Scale (mRS) scores at 90 days. Secondary outcomes included the rate of functional independence at 90 days and discharge and 24-hour National Institutes of Health Stroke Scale scores. The analyses were performed by 6-hour time-blocks (eg, morning 05:00-10:59) and by time as a continuous variable.
Results: In adjusted analyses, morning-treatment was associated with lower 90-day mRS scores compared to other times of the day (aOR, 1.27 [95% CI, 1.07-1.47]; p=0.004). This result was consistent in analyses of all secondary outcomes. Sinusoidal regression analysis mapped the time-of-day of treatment with best outcomes to 07:12. The association of successful recanalization with lower mRS scores at 90 days was more pronounced in morning- compared to evening-treated patients (aOR [95% CI]: 4.34 [1.67-12.50] vs. 2.00 [1.22-3.24], $p_{interaction}$=0.049) with the benefit from successful recanalization for morning patients persisting until 24-hours after onset while being lost after 11.5-hours for evening patients.
Conclusions: This study supports the idea of time-of-day effect on ischemic stroke evolution with better clinical outcomes and prolonged treatment benefits for morning-treated patients.
Disclosure of interest: Yes

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Evolution of neurovascular emergency care in the Auvergne Rhône-Alpes region (France)

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Background and aims: The objectives of the European Stroke Plan 2018-2030 were 90% of stroke patients treated in a stroke unit (SU), a reduced median time to access intravenous thrombolysis (IVT), the rates of IVT should be higher than 15% and endovascular treatment (EVT) higher than 5%. This study aims to assess the neurovascular care offer in a French region and its evolution in 10 years.
Methods: Hospitalized strokes and transient ischemic attacks (TIAs) were selected from the PMSI, a medico administrative databse. Thrombolysis and thrombectomy data were obtained from the stroke registries of the region's emergency networks from 2011 to 2021. Rates were calculed by SUs in Auvergne Rhone-Alpes region.
Results: More than 14,000 strokes were hospitalized in 2021, 78% were ischemic strokes and 4.600 were TIAs. Between 2011 and 2021, the number of ischemic strokes increased by 25%. Since 2015, the number of hemorrhagic strokes has decreased by 15%. More than 6,600 strokes were managed in 2021 in the 16 regional SUs, representing 47% of all hospitalized strokes. In 2021, more than 12% of ischemic strokes managed were treated by IVT and 7% by mechanical thrombectomy (+10% per year on average over the past 5 years).
Conclusions: On a regional scale, there is inequality of access to neurovascular emergency care, and despite an increase in the number of SUs beds over the last 10 years, the supply remains insufficient to allow uniform access to care over the territory, and emergency structures are directly affected.
Disclosure of interest: No

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Continuous glucose monitoring in acute ischemic stroke patients treated with endovascular therapy: a pilot study to assess feasibility and accuracy

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Background and aims: Hyperglycaemia is common in acute ischaemic stroke, and is associated with larger infarct volume and unfavorable functional outcome, also in patients who undergo reperfusion therapy. Previous randomized controlled trials on the effect of glucose lowering in the acute phase of ischaemic stroke failed to demonstrate effects on clinical outcome. Late and inaccurate observations may have contributed to the lack of these effects. Our aim was to study the feasibility and accuracy of continuous glucose monitoring (CGM) in patients with acute ischaemic stroke who underwent endovascular therapy (EVT).
Methods: All consecutive patients with ischaemic stroke and large vessel occlusion of the anterior circulation, who were eligible for EVT within 24 hours of symptom onset, were enrolled. CGM was performed using a Freestyle Libre 2. Feasibility was defined as the number of patients who could be registered for 24 hours and the delay in door-to-groin time of EVT because of sensor implantation. Accuracy of CGM was determined with the Parkes error grid analysis. Deferred consent procedure was used.
Results: Twenty-three patients were included of whom 20 completed 24 hours monitoring (87%). One patient did not give informed consent and one sensor broke during implantation and one after impantation. We found no significant delay in door-to-groin time and no adverse events. One hundred percent of CGM data are in zones A and B of the Parkes error grid analysis.
Conclusions: We showed that CGM in patients with acute ischaemic stroke who were treated with EVT is feasible, safe and accurate.
Disclosure of interest: No

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Global Brain Perfusion as prediction tool for early worsening in Acute Lacunar ischemic stroke (ALIS)

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Background and aims: Around 17% patients with acute lacunar ischemic stroke (ALIS) suffer from early neurological deterioration (END). Currently there is no effective way to predict the risk for END.
Methods: We evaluated retrospectively patients between 2016-2022, that underwent a CT-Perfusion (CTP) study on admission and were identified with ALIS on MR-Imaging. Global cerebral blood flow (gCBF) and global cerebral blood volume (gCBV) were measured on the initial CTP. NIH Stroke Scale (NIHSS) was compared during the first 48h and on discharge or latest 7 days after stroke onset.
Results: 135 ALIS patients were included in this study. gCBF/gCBV ration of <15 was selected as cut off. 53 (39%) patients showed a ratio <15 and 82 (61%) showed a ratio >15. 24 (18%) patients experienced END, as defined by >2 point increase of NIHSS, with 85,7% in the group of <15. A ratio of <15 gave a 39,6% probability of END, and a ratio >15 a probability of 3,7%. When applying a cut of >5 increase in the NIHSS and/or not improving from NIHSS 4 or higher, a gCBF/gCBV ratio <15 showed a probability of 88,7% in comparison to 13,4% with a ratio >15 to predict which patient will suffer END or not improve. Size as well as location of the lacunar stroke, blood pressure and prior background diseases showed no influence on outcome.
Conclusions: Global CTP gCBF/gCBV ratio could offer a tool for predicting which patient with ALIS will worsen.
Disclosure of interest: No

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EXTRACELLULAR VESICLE RESPONSE TO REMOTE ISCHEMIC CONDITIONING IN STROKE PATIENTS

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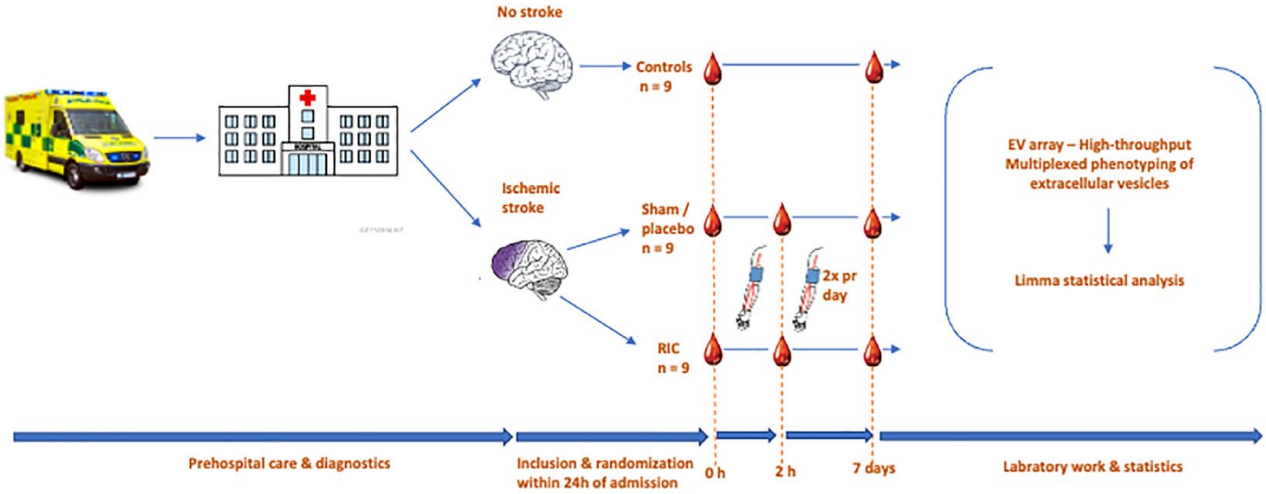
Background and aims: Remote ischemic conditioning (RIC) is a promising neuroprotective additive to the treatment of ischemic stroke patients. The mechanism behind RIC is hypothesized to be carried by extracellular vesicles (EV) and their content. EVs have the ability to cross the BBB and are furthermore tissue specific. EVs contain unique surface markers that can mirror stroke pathophysiology and be part of the neuroprotective response of RIC. This qualifies them as potential biomarkers for cerebral stroke diagnostics and point toward potential novel treatment targeting.
Methods: The workflow is detailed in figure 1. The surface markers of plasma EVs from ischemic stroke patients randomized to either RIC treatment or placebo were analyzed using the EV Array platform that simultaneously measures 40 surface markers. The concentration and size distribution of size exclusion chromatography (Izon) purified EVs was determined using NTA (NanoSight 300).
Results: Initial statistical analysis of the EV array data have shown significant differences in CD31(PCAM1) levels in stroke patient undergoing RIC treatment compared to placebo. This difference is significant both after first RIC treatment (p=0,033) and after 7 days of RIC treatment two times per day (p=0,047).
Conclusions: The identification of the molecular response caused by RIC on specific surface proteins of EVs associated to stroke, such as CD31(PCAM1), can lead to further identification of possible stroke diagnostic biomarkers and treatment targeting
Disclosure of interest: No



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PREHOSPITAL NIHSS AMD A MOBILE APPLICATION TO STANDARDISE COMMUNICATION BETWEEN PRE- AND IN-HOSPITAL STROKE SERVICES – A PARANASPP INTRACEREBRAL HAEMORRHAGE SUBGROUP STUDY

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Background and aims: Correct triage by paramedics influence the outcome for patients suffering acute stroke, including intracerebral haemorrhage (ICH), as early treatment increases the chance of a good outcome. The aim of this study is to assess the use of the ParaNASPP model with prehospital NIHSS and standardised communication between paramedics and stroke physicians in the subgroup of patients who received an ICH diagnosis.

Methods: From 2019 to 2021 the ParaNASPP trial explored the use of prehospital NIHSS and standardised communication between paramedics and stroke physicians in a stepped-wedge cluster randomised trial. 271 paramedics were trained to use a mobile application for prehospital NIHSS and standardised communication and were compared with paramedics using standard stroke protocol.

Results: Of 354 patients with an acute stroke diagnosis 37 (9.8%) had an ICH diagnosis (19 (8.8%) in the intervention group and 18 (11.1%) in the control group). NIHSS at admission was higher in the intervention group with 10 vs 7 in the control group (p =0.04). Time from hospital arrival to first CT was lower in the intervention group (15 minutes) than in the control group (20 minutes) (p=0.03). There was no difference in functional outcome between the two groups.

Conclusions: Standardised communication between pre- and in-hospital services reduced time from hospital arrival to first CT in patients with ICH. This opens for time reduction in initiation of focused therapy for this patient group and may be important in the development of ICH treatment in the future.

Disclosure of interest: No

ACUTE MANAGEMENT – NEITHER THROMBOLYSIS NOR THROMBECTOMY

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Deferred consent in an ambulance-based acute stroke treatment trial

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Background and aims: In MR ASAP, a multicentre ambulance-based trial of transdermal glyceryl trinitrate (GTN) in patients with presumed acute stroke, deferred consent was obtained in 325 (86%) of 380 randomised patients. We aimed to gain insight in the causes of the considerable proportion of patients who did not consent.

Methods: In this mixed-methods substudy of MR ASAP, we described baseline characteristics of patients who did not consent and conducted semi-structured interviews with local investigators on their experience with deferred consent.

Results: Of 55 patients without deferred consent, 22 were allocated to GTN and 33 to control. Final diagnosis was more often a stroke mimic in patients randomised to control than to GTN (8/33 [24%] and 2/22 [9%], respectively). Of 18 participating hospitals, 11 local investigators were interviewed. All investigators justified the use of deferred consent in MR ASAP. Most of their patients did not object to the concept of deferred consent. Main reasons for not obtaining consent were poor identification of patients who had undergone prehospital randomisation, lacking time in a setting of fast patient turnover, and problems with obtaining written consent after discharge. Suggestions for improvement included periodic training of ambulance and hospital personnel to optimise information transfer, more dedicated research staff, and using a study-specific wristband for patient identification.

Conclusions: Missing deferred consent may lead to selection bias. The lack of consent in 14% of all randomised patients appeared to be mainly due to organisational issues and not because patients objected to the concept of deferred consent.

Disclosure of interest: No

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Tandem lesions, emergent carotid artery stenting and the value of intravenous alteplase before thrombectomy: a subgroup analysis of the SWIFT DIRECT trial

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Background and aims: Value of intravenous thrombolysis (IVT) in eligible tandem lesion patients undergoing endovascular treatment (EVT) is unknown. We investigated treatment effect heterogeneity of EVT+IVT versus EVT-only in tandem lesion patients undergoing emergent internal carotid artery (ICA) stenting.
Methods: This is a post-hoc analysis of the SWIFT DIRECT trial which randomized patients to either the EVT+IVT or EVT-only treatment arm. Primary outcome was 90-day functional independence (modified Rankin Scale score 0-2). Secondary endpoints were reperfusion success, 24-hour intracranial hemorrhage rates and 90-day all-cause mortality. Interaction models were fitted for all outcomes.
Results: Among 408 included patients (EVT+IVT: 207, EVT: 201; median age 72 years [IQR 64, 81]; 51.2% female), 63 (15.4%) had a tandem lesion, out of which 33 (52.4%) received IVT. In the fitted interaction models, tandem lesion and extracranial stent placement did not show treatment effect modification of EVT+IVT vs EVT on 90-day functional independence (OR 1.19, 95% CI 0.38 – 3.74; p for interaction = 0.77). Equivalent effect was also shown for reperfusion success (OR 5.66, 95% CI 0.25 – 126.68; p for interaction = 0.27), 24-hour intracranial hemorrhage rates (OR 0.44, 95% CI 0.15 – 1.36; p for interaction = 0.15) and 90-day mortality (OR 1.44, 95% CI 0.30 – 6.98; p for interaction = 0.65).
Conclusions: This post-hoc analysis does not suggest treatment effect heterogeneity of EVT+IVT versus EVT-only in tandem lesion patients undergoing emergent ICA stenting. Tandem occlusion or emergent ICA stenting should not be a reason to withhold IVT in patients with direct access to EVT.
Disclosure of interest: No

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Thrombectomy for Distal Medium Vessel Occlusion Stroke: Combined versus Single-device Techniques – A Systematic Review and Meta-Analysis

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Background and aims: The optimal mechanical thrombectomy technique for acute ischaemic stroke (AIS) caused by distal, medium vessel occlusion (DMVO) is uncertain. We performed a systematic review and meta-analysis evaluating the efficacy and safety of first-line thrombectomy with combined techniques, entailing simultaneous use of stent retriever and aspiration catheter, versus single-device techniques, whether stent retriever or direct aspiration alone, for DMVO-AIS.
Methods: We systematically searched PubMed, Embase and Cochrane databases from inception until 2 September 2022 for studies comparing combined and single-device techniques in DMVO-AIS, adopting the Distal Thrombectomy Summit Group's definition of DMVO. We evaluated modified first-pass effect (mFPE; modified Thrombolysis in Cerebral Infarction [mTICI] 2b-3 at first-pass), first-pass effect (FPE; mTICI 2c-3 at first-pass), successful and complete final reperfusion (mTICI 2b-3 and 2c-3 at end of all procedures, respectively), 90-day functional independence (modified Rankin scale 0-2), 90-day mortality, and symptomatic intracranial haemorrhage (sICH).
Results: Nine studies incorporating 1147 patients were included. Combined techniques achieved significantly higher odds of mFPE (odds ratio [OR], 2.12; 95% confidence interval [CI], 1.12-4.02; p=0.021) and FPE (OR, 3.55; CI, 1.97-6.38; $p<0.001$), with lower odds of sICH (OR, 0.23; CI, 0.06-0.93; p=0.040). There were no significant differences in final reperfusion, functional independence (OR, 1.19; CI 0.87-1.63; p=0.658), or mortality (OR, 0.94; CI, 0.50-1.76; p=0.850).
Conclusions: In DMVO-AIS patients, combined techniques for mechanical thrombectomy achieved higher odds of FPE and lower odds of sICH than single-device techniques, with clinical equipoise in functional independence and mortality. Further trials are warranted to establish these findings.

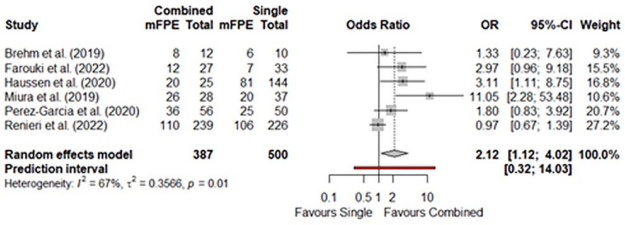

Figure 1. Forest plots comparing the modified first pass effect (mTICI 2b-3) in combined versus single-device techniques.

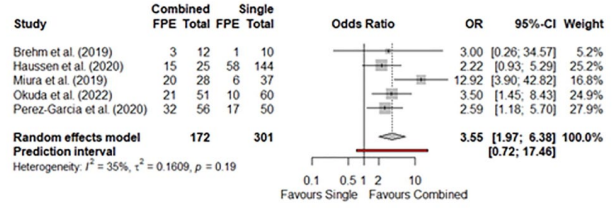

Figure 2. Forest plots comparing the first pass effect (mTICI 2c-3) in combined versus single-device techniques.

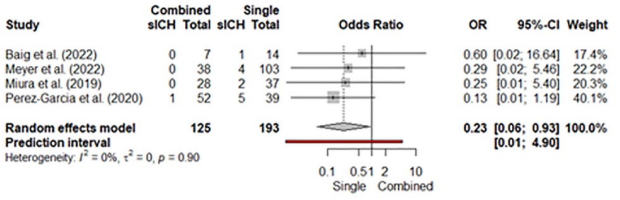

Figure 3. Forest plots comparing the symptomatic intracranial haemorrhage (sCIH) in combined versus single-device techniques.

Disclosure of interest: No

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Intravenous alteplase versus tenecteplase in patients with acute posterior circulation strokes: secondary analysis from the AcT trial

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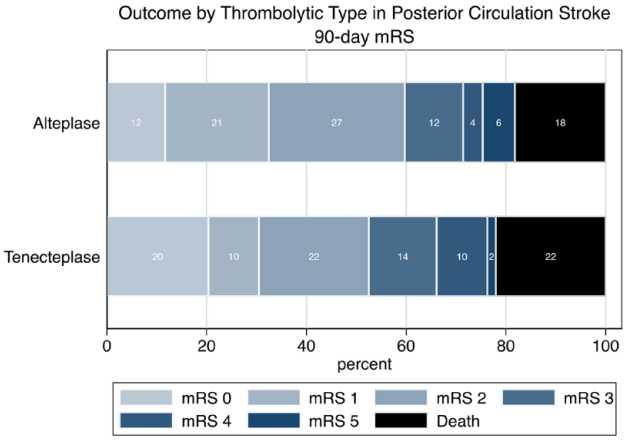
Background and aims: There are limited data available demonstrating the safety and efficacy of intravenous tenecteplase versus alteplase in patients with acute ischemic posterior circulation strokes.

Methods: This is a post-hoc analysis of the Alteplase compared to Tenecteplase (AcT) pragmatic, phase 3, registry linked randomized controlled trial. Patients with any posterior circulation vessel occlusion on baseline CTA were included. Primary outcome was 90-day mRS 0-1. Secondary outcomes included mRS 0-2, death within 90 days, and 24h symptomatic intracerebral haemorrhage(sICH). Appropriate multivariable analyses adjusting for baseline age, sex and stroke severity was used to analyze differences in outcomes between patients administered tenecteplase vs. alteplase.

Results: Of 1577 patients, 136 (8.6%) patients had posterior circulation stroke [31(22.8%) basilar occlusions, 19(14.0%) vertebral occlusions, 76(55.9%) posterior cerebral artery occlusions and 11(8.1%) posterior/anterior inferior cerebellar artery occlusions), of which 77 received alteplase and 59 tenecteplase. Baseline characteristics were similar [median age 71 (IQR 60-81) vs. 72 (IQR 65-82), 57.1% vs. 67.8% were male, median baseline NIHSS 7 (IQR 4-12) vs. 7 (IQR 4-16) in alteplase vs. tenecteplase arm, respectively]. 20.6% patients underwent EVT. 25 (32.5%) vs. 18 (30.5%) patients in alteplase vs. tenecteplase arm achieved mRS 0-1 in 90-days (adjRR 0.93, 95%CI 0.63-1.36). There were no differences in 90-day mRS 0-2 (adjRR 0.95, 95%CI 0.72-1.26), sICH (adjRR 0.63, 95%CI 0.04-8.8) and death rates (adjRR 0.93, 95%CI 0.41-2.12) between patients administered either thrombolytic (Figure).

Conclusions: Intravenous tenecteplase has a similar effect on outcome as alteplase, without increased safety risks in patients with acute posterior circulation strokes.

Disclosure of interest: No



ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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Influence of Age On Outcomes In Patients Receiving Alteplase And Tenecteplase: A Secondary Analysis From The Act Trial

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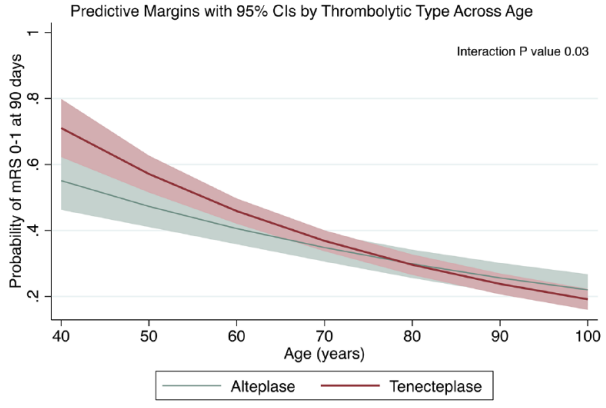
Background and aims: We assessed the association of age with clinical outcomes in patients presenting with acute ischemic stroke and whether this association differs by whether they receive intravenous tenecteplase (TNK) versus alteplase.

Methods: Data are from AcT, a pragmatic, randomized controlled trial comparing tenecteplase with alteplase. Primary outcome was modified Rankin scale 0-1 at 90 days. Safety outcomes included symptomatic

intracerebral hemorrhage(SICH) and 90-day mortality rates. Patients aged <80 years were compared to those ⩾80 years at symptom onset. Mixed effects Poisson regression was used to assess a)the association of age with outcomes b)if these associations were modified by thrombolytic agent(TNK vs. alteplase), after adjusting for sex and stroke severity. Effect modification by treatment was tested with threshold p <0.1

Results: Of the 1577 patients, 1034(65.6%)[520 TNK, 514 alteplase] were <80years and 543(34.4%) [286 TNK, 257 alteplase] were ⩾80 years. Baseline patient characteristics in the two groups were similar. Type of thrombolytic agent (TNK vs. alteplase) significantly modified the association between age and mRS 01 (p = 0.03) with better outcomes with tenecteplase in younger age(Figure). In those <80y, rates of 90-day mRS 01 were 44.4% and 40.3% in TNK and alteplase arms respectively [adjRR 1.09 (0.95-1.26)] vs. 22.7% and 23.1% respectively[adjRR 0.98 (0.72-1.34)] in those ⩾80y group. SICH and death rates were similar in both groups(RR 0.94 (0.67-1.19) and 0.99 (0.41-2.41)] respectively.

Conclusions: Tenecteplase is as effective and safe as alteplase across age groups, but may have additional benefit in younger people with ischemic stroke



Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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COMPARISON OF CT HYPOPERFUSION-HYPODENSITY MISMATCH WITH AUTOMATED PERFUSION MISMATCH FOR THE IDENTIFICATION OF PATIENTS WITH STROKE SUITABLE FOR THROMBOLYSIS

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Background and aims: Automated perfusion imaging can identify patients with unknown time of stroke onset suitable for thrombolysis. However, access to this technique is limited. We therefore established the novel concept of CT hypoperfusion-hypodensity mismatch to identify patients suitable for thrombolysis. Hypoperfusion-hypodensity mismatch is defined as presence of an ischemic core lesion visible on CCT perfusion without visible hypodensity in corresponding native CCT. We compared accuracy of hypoperfusion-hypodensity mismatch with that of automated perfusion imaging.

Methods: In a retrospective analysis, patients were classified as suitable or not for thrombolysis based on their time of symptom onset or for those beyond 4.5 hours of onset by established imaging criteria, i.e. automated perfusion imaging. We compared the accuracy of hypoperfusion-hypodensity mismatch with automated perfusion imaging regarding the identification of patients suitable for thrombolysis.

Results: We included 247 patients. 219 (88.7%) were and 28 (11.3%) were not eligible for thrombolysis. Hypoperfusion-hypodensity mismatch identified 190 (96.4%) and automated perfusion imaging 88 (44.7%) patients suitable for thrombolysis (p<0.001). Hypoperfusion-hypodensity mismatch compared to automated perfusion mismatch quantification identifies patients with unknown time of symptom onset, but suitable for thrombolysis by following accuracy: sensitivity 89.0% vs. 50.2%, specificity 71.4% vs. 100.0%, positive predictive value 96.1% vs. 100.0%, negative predictive value 45.5% vs. 20.4%.

Conclusions: Compared to automated perfusion mismatch quantification the novel concept of hypoperfusion-hypodensity mismatch identifies patients with unknown time of symptom onset, but suitable for thrombolysis with higher sensitivity and lower specificity. Using this simple method can increase the proportion of patients treated with thrombolysis.

Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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INTRAVENOUS TENECTEPLASE COMPARED WITH ALTEPLASE FOR MINOR ISCHEMIC STROKE: A SUBGROUP ANALYSIS OF THE ACT RANDOMIZED CLINICAL TRIAL

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Background and aims: The benefit of intravenous thrombolysis for patients with minor stroke remains unclear. We compared outcomes of stroke patients with NIHSS ⩽*5* treated with intravenous tenecteplase vs alteplase as part of the Alteplase compared to Tenecteplase (AcT) randomized trial.

Methods: The AcT trial included 1600 stroke patients >18 years age who were eligible for intravenous thrombolysis as per standard of care in Canada and randomized them to receive either tenecteplase or alteplase. Individuals with pre-thrombolysis NIHSS of ⩽5 were included in this *post-hoc* analysis. The primary outcome was excellent functional outcome(mRS 0-1) at 90 days. Mixed effects Poisson regression model was used to analyze efficacy and safety outcomes after adjusting for age, sex and occlusion site; with the study site as random effects variable.

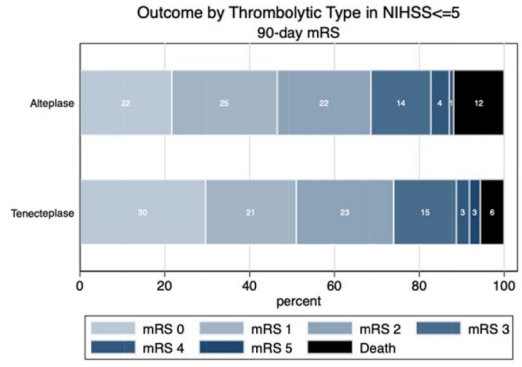
Results: Of the 378 patients who presented with minor stroke, 39.7% were women, the median age was 71 years, and 194 (51.3%) received tenecteplase and 184 (48.7%) alteplase. The proportion of patients with mRS 0-1 at 90 days was similar in both groups(51.8% tenecteplase vs 47.5% alteplase; aRR = 1.14 [95% CI, 0.92-1.40]). There were no differences in secondary outcomes (see Table). Death within 90 days occurred less often in those treated with tenecteplase compared to alteplase (aRR = 0.45 [95% CI, 0.21-0.79]). Rates of sICH were similar between groups (aRR =0.85[0.25-2.89]).

Conclusions: For patients enrolled in AcT presenting with minor stroke, tenecteplase was as effective and safe as alteplase. There were fewer deaths at 90 days in those treated with tenecteplase.

Disclosure of interest: No

	Tenecteplase group (n=194)	Alteplase group (n=184)	Risk Ratio (unadjusted)	Risk Ratio (Adjusted)[a]
Primary end point				
modified Rankin Score 0-1 at 90 days — no. (%)	100 (51.8)	86 (47.5)	1.09 (0.88-1.23)	1.14 (0.92-1.40)
Secondary endpoints				
modified Rankin Score 0-2 at 90 days — no. (%)	143 (74.1)	126 (69.6)	1.06 (0.93-1.20)	1.09 (0.94-1.26)
modified Rankin Score at 90 days - median (IQR)	1 (0-3)	2 (1-3)	0.74 (0.52-1.07)	0.69 (0.47-1.00)[b]
EQ5D-VAS, median (IQR)	75 (61-86)	75 (60-90)	0.91 (0.63-1.32)	0.99 (0.97-1.02)
Return to baseline function — no. (%)	80 (42.5)	61 (35.3)	1.20 (0.92-1.56)	1.20 (0.90-1.59)
Endovascular Thrombectomy Utilization — no. (%)	22 (11.3)	15 (8.1)	1.39 (0.74-2.59)	0.88 (0.53-1.47)
Length of hospital stay - median (IQR)	4(2-8)	4(2-7)	0.91 (0.62-1.30)	0.86 (0.79-0.93)

Data are n (%), median (IQR), mean (SD), or effect estimate with 95% CI in parentheses. [a]Adjusted for age, sex, occlusion location as fixed- effects variables, and site as a random effects variable. [b]Common odds ratio is the odds ratio for a unit increase in the modified Rankin scale score for tenecteplase vs alteplase



ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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Comparing standard vs extended time window reperfusion treatments in an MRI based stroke care system- a prospective single-centre study

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Background and aims: Current ESO guidelines recommend extended time window reperfusion therapies based on advanced imaging, however, the workload and clinical benefit of extending time windows on a population basis are unknown.

To determine the caseload, treatment rates, and outcomes in the extended as compared to the standard time windows for reperfusion therapies in an MRI-based stroke care system.

Methods: All consecutive ischemic stroke patients within 24h from 1st March 2021 to 28th of February 2022 were included in a prospective single-centre study. Eligibility in the extended time windows or wake-up strokes recognized within 4h was based on MRI DWI/PWI or DWI-FLAIR mismatch using current ESO guideline criteria. MRI was only available during working hours (8-20 h). Clinical outcome in treated patients was assessed at 3 months.

Results: During 12 months, 777 patients were admitted, 252 (32%) had MRI. 120/304 (39.4%) patients were thrombolysed in standard and 14/231 (6%) in extended time window. Independent clinical outcome (mRS⩽2) was seen in 57/116 (49.1%) early and 4/14 (28.6%) late-treated patients (P=0.25). 38/386 (9.84%) patients underwent thrombectomy in standard and 16/391 (4%) in extended time window. Independent clinical outcome (mRS⩽2) was seen in 10/29 (34.5%) early and 4/13 (31%) late-treated patients (P=0.99).

Conclusions: Even with limited availability of advanced imaging extending time windows for reperfusion therapies resulted in an 11,6% increase in thrombolysis and a 42% increase in thrombectomy with similar clinical outcomes in early and late-treated patients at the price of increased burden of clinical and imaging screening.

Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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Safety of Tenecteplase as compared to Alteplase in Older Patients A Secondary Analysis From The Act Trial

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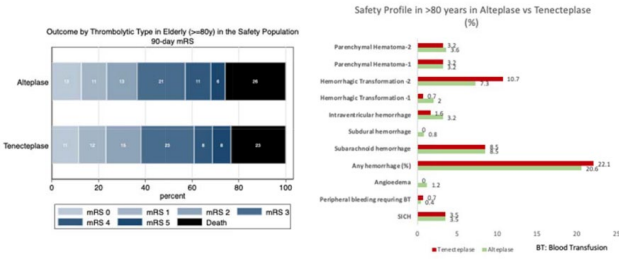
Background and aims: Robust data on safety of tenecteplase in patients older than 80 years is limited. We assessed outcomes in elderly patients (⩾80 years) presenting with acute ischemic stroke who received intravenous tenecteplase (TNK) versus alteplase with a specific focus on safety.

Methods: Data are from patients included in AcT, a pragmatic, registry linked, phase 3 randomized controlled trial comparing tenecteplase with alteplase. Patients ⩾80y who received any dose of thrombolytic were included. Primary safety outcome was symptomatic intracerebral hemorrhage (SICH). Secondary safety outcomes included 90-day mortality, parenchymal hematoma type 2 (PH-2), peripheral bleeding requiring blood transfusion and angioedema. Mixed effects Poisson regression after adjusting for sex, and baseline stroke severity was used to assess all outcomes.

Results: Of the 1563 patients included, 539 (34.1%) [285: TNK, 254 alteplase] were ⩾80 years of age. Baseline characteristics were similar in both arms. All safety outcomes including rates of SICH [adjRR 1.00 (95%CI 0.32-3.05)], PH-2 [adjRR 0.91 (95%CI 0.33-2.52)] and mortality [adjRR 0.94 (95%CI 0.72-1.23)] were similar between the two groups. Efficacy outcomes using modified Rankin Scale were similar in both arms (adjRR 1.01 (95%CI 0.91-1.03) (Figure).

Conclusions: In an elderly stroke population, tenecteplase had similar safety and efficacy outcomes as compared to alteplase.



Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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The importance of aspiration catheter size in aspiration thrombectomy: 5 vs 6fr Sofia catheter in M1 occlusions

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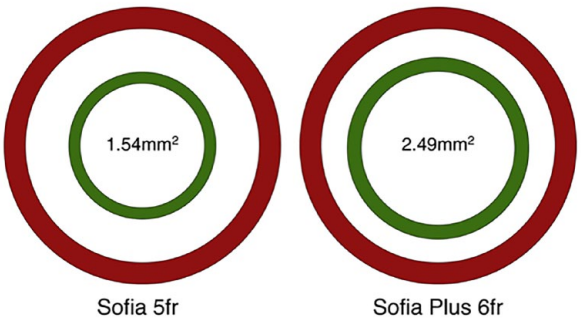
Background and aims: To determine the effect of aspiration catheter size on procedural outcomes of aspiration thrombectomy in patients with ischemic strokes due to M1 occlusion.

Methods: We compared procedural and clinical outcomes in patients with M1 occlusions treated with mechanical aspiration thrombectomy using either a 5 French (fr) Sofia or a 6fr Sofia Plus aspiration catheter at our institution over a 2-year period. A good clinical outcome was defined as a modified Rankin Scale score of 0-2 at 90 days.

Results: 68 patients were included, 28 in the 5fr group and 40 in the 6fr group. Patients treated with a 6fr catheter had significantly higher rates of first pass TICI 2C/3 (50.0% vs 25.0%, p=0.04) and final TICI 2C/3 (80.0% vs 57.1%, p=0.04). The number of passes and the need for rescue stent retriever treatment were non-significantly lower in the 6fr group. Rates of good clinical outcome and death at 90 days did not differ between groups.

Conclusions: Use of a 6fr aspiration catheter was associated with significantly better procedural outcomes in patients with M1 occlusion treated with aspiration thrombectomy. No differences in clinical outcome were found, likely due to limited sample size.



Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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DETERMINANTS AND OUTCOMES OF REVASCULARIZATION TREATMENT IN MEDIUM VESSEL OCCLUSION RELATED ACUTE ISCHEMIC STROKE

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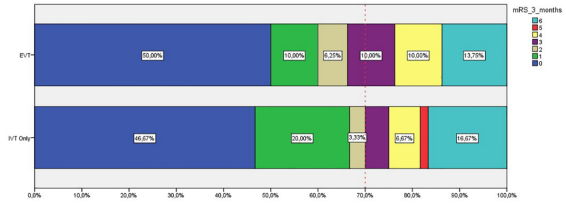
Background and aims: Medium vessel occlusions (MeVO) are associated with less severe clinical syndromes and were insufficiently included in endovascular pivotal treatment trials. Recent data suggest that outcomes in patients with MeVO may be suboptimal with only medical management, but the EVT for MeVOs has not been definitively established as standard of care. The aim of our study is to explore the real life decision-making process determinants and outcomes.
Methods: Our data were prospectively collected from February 2019 to September 2022 in Erebouni Comprehensive stroke center of Yerevan.
Results: 150 consecutive patients with anterior circulation MeVO occlusions have been included, 61 treated by IVT only and 89 by EVT (28 with IVT). 92% (12/ 150) of patients had M2 occlusions. The baseline NIHSS was significantly higher in EVT group (12.8 vs. 10.4,p<0.02). The TICI2b/3 was obtained in EVT group in 87.3% (76/87) patients. The mRs at 3 months distribution was similar between EVT and IVT groups (graph). Our efficacy and safety outcomes are consistent with published data (table).
Conclusions: The initial severity of stroke remains the main determinant for EVT choice in MeVO related acute stroke.

Baseline characteristics and outcomes	**Overall *(n=150)***	**Only IVT *(n=61)***	**EVT** (± IVT) ***(n=89)***	p
Age*	**69.9***(10.5)*	**69.7***(10.7)*	**70***(10.3)*	0.8
Admission NIHSS*	**11.8***(5.9)*	**10.4***(5.4)*	**12.8***(6.2)*	**0.013**
Functional independence at 3 months (mRs0-2)**	95/140**(68%)**	42/60**(70%)**	53/80**(66%)**	0.2
NIHSS H24*	*5.9(6,7)*	*5.3(5.8)*	**6.4***(7.3)*	0.3
Early Neurological Deterioration (END)**	9/150**(6%)**	2/61**(3.3%)**	7/89**(7.9%)**	0.3
Symptomatic hemorrhage**	5/150*(2.8%)*	1/61*(1.6%)*	4/89*(4.5%)*	0.3
Mortality**	21/140**(15%)**	10/60**(16.7%)**	11/80**(13.8%)**	0.2

*Mean(SD);**n(%).



Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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Influence of Renal Function on Blood Pressure control and Outcomes in Thrombolysed Patients after Acute Ischemic Stroke: a post hoc analysis of ENCHANTED trial

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Background and aims: Renal dysfunction (RD) is a risk factor of poor outcome in patients with acute ischaemic stroke. This study aims to evaluate whether RD would modify the effect of intensive blood pressure lowering on clinical outcomes in the ENCHANTED trial.
Methods: Secondary analysis of the ENCHANTED trial blood pressure (BP) arm which randomly allocated patients into either intensive BP lowering (target systolic BP <140mmHg) or guideline-recommended BP control (target SBP <180mmHg) group. We calculated the Estimated glomerular filtration rate (eGFR) for each patient using the Chronic Kidney Disease–epidemiology Collaboration (CKD-EPI) equation. Stages of renal function were classified as G1 reflecting normal renal function (eGFR ⩾90 mL/min per 1.73 m2), G2 mildly reduced (60–89) and G3 moderate-to-severe reduced (<60), respectively. The outcome of interest was functional recovery at 90 days using multivariate logistic regression models.
Results: In 2151 patients with renal function data available (mean age 66.9 years, 38% female), 822 (38.2%), and 336 (15.6%) patients had renal impairment in G2 and G3 stage, respectively. Compared with patients in stage G1, those in stage G3 had increased mortality (adjusted odds ratio [aOR] 1.77; 95% confidence interval [CI] 1.05–2.99; p=0.031 for trend). There was significant heterogeneity between decreased eGFR and treatment (p for interaction = 0.545). In patients with severe renal dysfunction, the frequency of symptomatic intracerebral haemorrhage was higher (p for trend <0.05).
Conclusions: Severe renal dysfunction is associate with increased mortality, which might be through increasing the risk of symptomatic and fatal intracerebral haemorrhage.
Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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Influence of Prior Diabetes Mellitus on Outcome for Thrombolysis-Treated Acute Ischemic Stroke: a post hoc analysis of ENCHANTED trial

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Background and aims: History of diabetes mellitus (DM) are considered relative constraindication poor prognosis after stroke. We determined associations of DM on functional recovery in the Enhanced Control of Hypertension and Thrombolysis Stroke Study (ENCHANTED).
Methods: ENCHANTED was an international, multicentre, 2x2 factorial, open, blinded endpoint, randomised controlled trial where no

difference in functional recovery was found between intensive (target <140mmHg) versus standard (<180mmHg) SBP management in thrombolysis-treated AIS patients. The association of DM on death, disability (mRS scores 2–5) and major disability (mRS scores 3–5) at 90 days were assessed in logistic regression models.

Results: In 2179 AIS patients (mean age 66.9 years, female 38.0%), 494 (22.67%) existed DM. The history of DM was associated with disability (adjusted odds ratio [aOR] 1.51, 95% CI 1.20-1.90) and major disability (aOR 1.70, 95% CI 1.32-2.18). However, history of DM was not associated with mortality (aOR 1.15, 95% CI 0.78-1.68) or symptomatic intracerebral hemorrhage. There was no differential effect of intensive versus guideline-recommended blood pressure lowering on poor outcome at 90-days by a history of DM.

Conclusions: A history of DM was an independent predictor of disability and major disability in thrombolysis-treated AIS patients.

Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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Sex-related differences in endovascular thrombectomy outcomes

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Background and aims: Women face a disproportionate burden of stroke mortality and disability. The aim of the study is a sex-related analysis of the process and outcomes of the treament with endovascular thrombectomy in a large german maximum care hospital.

Methods: We analyzed retrospective demographic data, clinical and neuroradiological parameters, such as recanalization rate and infarct volume. All of the patients (N=694; 52,0% women) underwent a mechanical thrombectomy in one large german maximum care hospital between 01/2017 and 12/2020.

Results: In this cohort, women were significantly older than men (77.1±12.4 versus 70.6±13.7 y.o; $p<0.001$). Because of the significant age difference, we performed an age-adjustment. In the age group of 80-89 years (N=237, 62% women) the women had longer DNT, whereas men received more acute carotid stenting (16.7% vs. 0.7%, $p<0.001$) without a detectable difference in the stroke-etiology.

Among the patients younger than 70 y.o. (N=227, 35.7% women), we observed a shorter EDT and a more often complete reperfusion (TICI 3) among women (65.4% vs. 48.6%). Furthermore women had more often a proximal occlusion of the ACM (72.8% vs. 58.2%, p=0.028), a longer DTP (median 96 vs. 82,5 minutes, p=0.038) and an excellent outcome, defined as mRS 0 or 1 on discharge (23.7% vs. 14.7%).

Conclusions: This study shows, that in clinical practice there are significant sex-related differences. Older women had a longer DNT and received less frequent an acute carotid stending, whereas younger women in our cohort had better recanalization rate and outcome on discharge.

Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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Association of White Matter Disease with Outcomes in Acute Stroke Patients Receiving Alteplase and Tenecteplase: Results from the AcT Trial

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Background and aims: We assessed the association of white matter disease (WMD) with clinical and imaging outcomes in patients receiving intravenous thrombolysis for acute ischemic stroke. We further assessed whether this association differs by tenecteplase (TNK) versus alteplase.

Methods: Patients from the Alteplase compared to Tenecteplase (AcT) trial were included. WMD was assessed by Fazekas score on baseline non-contrast CT head. A summative (periventricular plus deep white matter) Fazekas score of 0 was classified as no WMD, a score of 1-2 as mild WMD and a score >2 as moderate-severe WMD. The primary outcome was the modified Rankin Scale (mRS) 0-1 at 90-days. Safety outcomes included symptomatic intracerebral hemorrhage(sICH) and 90-day mortality rates.

Results: Among 1568 patients, 790 (50.3%) had no evidence of WMD, 450 (28.7%) had mild WMD and 328 (20.9%) had moderate-severe WMD. Patients with moderate-severe WMD were older (65.9±14.3 years [Fazekas 0] versus 81.3±9.1 years [Fazekas>2], p<0.0001) and were more likely to be female (36.9% versus 63.1%, p<0.0001). Patients with moderate-severe WMD had lower adjusted (age, sex, and stroke severity) odds (0.42, 95%CI:0.26-0.67) to achieve an mRS 0-1 at 90 days. There was no increased risk of sICH or 90-day mortality in patients with moderate-severe WMD. Treatment assignment to either TNK or alteplase in patients with moderate-severe WMD was associated with similar outcomes ($p_{interaction}$=0.8).

Conclusions: In this large pragmatic trial, WMD was associated with worse functional outcomes after thrombolysis but was not independently associated with sICH or mortality, regardless of the thrombolytic agent used.

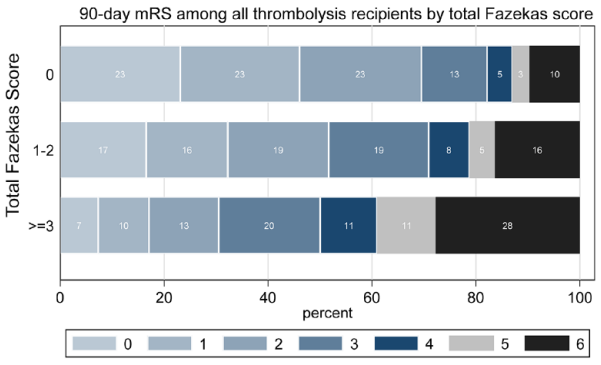

Figure 1. Distribution 90-day modified Rankin Scale (mRS) scores in the total study population of the AcT trial, stratified by white matter disease burden.

Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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The combination of CTP CBF and transit time coefficient variation seems promising in predicting tissue outcome in patients with AIS and large vessel occlusions

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Background and aims: Perfusion CT (CTP) is used to assess tissue viability and predict outcome in acute ischemic stroke (AIS). Current CTP calculations struggle in differentiating penumbra and core. Transit time coefficient variation (CoV) is a calculation used to analyse the microvascular environment. The aim of this study was to evaluate if CoV adds value to conventional cerebral blood flow (CBF) in the prediction of tissue outcome.

Methods: 62 IVT-treated AIS patients with large vessel occlusions (LVO) prospectively registered in a local thrombolysis registry underwent CTP in the acute setting and follow up magnetic resonance imaging (MRI) within 24 hours. 41 patients were treated with mechanical thrombectomy. Final infarct core was manually outlined on DWI, and CBF and CoV voxel values were compared. CoV and CBF were normalized to normal appearing white matter by division.

Results: Preliminary results show that for low CBF, there was a peak of normalized voxel values with CoV around 1 for ischemic tissue. For tissue that developed into infarction, this peak was found for normalized CoV values slightly above 1, while for tissue that did not develop into infarction, this peak was found for CoV equal to or slightly below 1.

Conclusions: For low CBF, CoV seems promising in predicting tissue outcome in patients with acute ischemic stroke and large vessel occlusions.

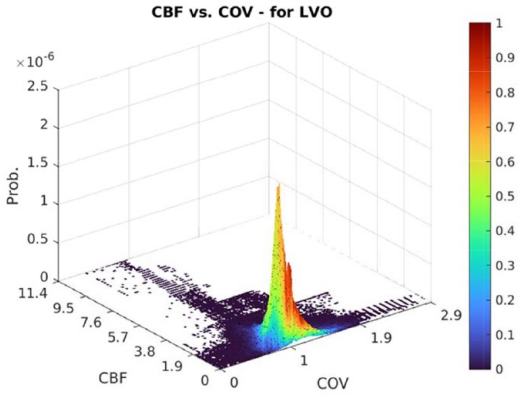

Figure 1: The height of the curve represents the proportion of voxels with a given combination of voxel values in the ischemic region. The color of the curve represents the proportion of voxels for a given combination of voxel values with subsequent infarction on follow-up MRI.

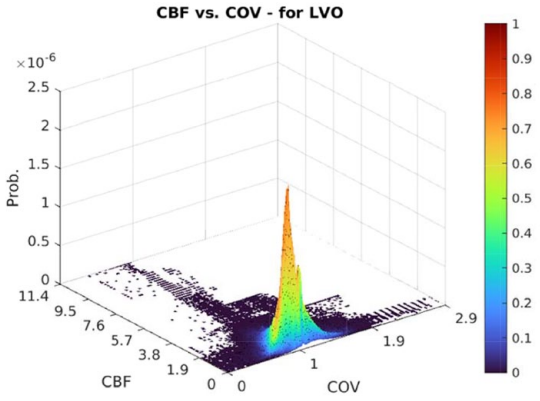

Figure 2: The height of the curve represents the proportion of voxels with a given combination of voxel values in the ischemic region. The color of the curve represents the proportion of voxels for a given combination of voxel values without subsequent infarction on follow-up MRI.

Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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The relationship of thrombus composition with mechanical thrombectomy techniques in acute ischemic stroke

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Background and aims: Examination of thrombus material after endovascular treatment of acute ischemic stroke provides an understanding of the pathophysiology and increases the success of treatment. In this article, our aim is to evaluate the thrombus composition after thrombectomy and to evaluate the clinical and radiological effects of the applied thrombectomy technique.
Methods: The thrombi of 166 patients who underwent mechanical thrombectomy for acute ischemic stroke between 2017 and 2020 were retrospectively analyzed. The thrombus was examined histologically. Pre-interventional imaging features, stroke subtypes, and interventional parameters were reanalyzed. Statistical analysis was performed with the Kruskal-Wallis test, Mann-Whitney U test, or Spearman correlation, as appropriate.
Results: A total of 166 were included in the study. The overall average percentage of red blood cells (RBC), white blood cells (WBC), mixed components in thrombi was 39.8%, 34.9%, and 25.3% respectively. There was no significant difference between the groups in terms of the application of aspiration, stent and combined techniques (p=0.063).
Conclusions: In our study, thrombus composition did not correlate with revascularization and clinical outcomes. Composition of an acute ischemic thrombus may reflect the pathophysiology of stroke and affect treatment efficacy.
Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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Evaluation of Contrast Extravasation and its Relationship with Clinical Prognosis after Thrombectomy in Patients with Acute Cerebral Stroke

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Background and aims: The phenomenon of contrast extravasation is expressed as associated with increased blood-brain barrier (BBB) permeability of ischemic brain tissue. Angiographic contrast is seen outside the normal cerebral vascular area after mechanical thrombectomy (MT). We aimed to study the periprocedural clinical factors affecting extravasation and its relationship with clinical outcome.
Methods: 137 patients who were hospitalized in the Neurological Intensive Care Unit of Ege University Hospital after mechanical thrombectomy between 2018-2022 were examined. Demographic characteristics, vascular risk factors, antiaggregant/anticoagulant use of the patients before admission were questioned. Prognosis assessment was made on mRS at 90 days.
Results: 137 patients were included. The mean age was 67 (min:24 max:86).
49.6% of the patients were female, 50.4% were male. Entry NIHSS was ⩾13 in 61% of the patients.The successful recanalization rate (TICI 2b-3) was 94.8%. Contrast extravasation was detected in 36 patients (26.3%). As age increases, the proportion of patients who develop contrast extravasation increases (p=0.006). Contrast extravasation was associated with significantly worse TICI score (p=0.044). The decrease in the 24th hour NIHSS compared to the entry NIHSS was significantly lower in extravasation group (p=0.03). Extravasation was found to be associated with a significantly worse TICI score.
Conclusions: Contrast extravasation has been associated with poor clinical outcome and poor recanalization. Age was found to be higher in the group with contrast extravasation.
Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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COMBINATION THERAPY USING SOLITAIRE AND THE REACT ASPIRATION CATHETER IN MECHANICAL THROMBECTOMY: INITIAL EXPERIENCE FROM INSPIRE-S REGISTRY

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Background and aims: Mechanical thrombectomy (MT) using the combination therapy (CT) technique (stent-retriever plus aspiration) has

shown promising results; however, limited real-world data exists for the React™ aspiration catheter and Solitaire™ in CT. Here, we present the interim results of the CT cohort from the INSPIRE-S Registry.

Methods: INSPIRE-S Registry is an ongoing, prospective, core-lab adjudicated, global registry of AIS patients treated with Medtronic Neurovascular devices on the first pass per device labelling. There are three MT technique cohorts in INSPIRE-S, stent-retriever only, aspiration only, and CT. Key clinical, procedural, and angiographic outcomes are presented for the CT group.

Results: From May 2020 to May 2022, 258 CT patients were enrolled with mean age of 73.5 ± 13.51 years. Mean baseline NIHSS was 14.2±6.88 and ASPECTS was 8.3±1.76. The majority of CT patients (80.8%) presented with MCA (M1/M2) occlusions. Mean procedural time was 64.6±51.4 minutes. On the first pass, React™ 68 and 71 was used in 46.9% and 47.7% of patients, respectively, and Solitaire™ X in 90.3%. BGC was used on the first pass in 32.9%. Mean number of passes was 1.9 ± 1.34. Rates of successful revascularization (eTICI⩾2b50) and first pass effect (eTICI⩾2c) was 91.6% and 47.5%, respectively. Ninety-day good functional outcome (mRS⩽2) was achieved in 49.0%. Rates of mortality and sICH were 19.0% and 0.8%, respectively.

Conclusions: This interim analysis of INSPIRE-S provides real-world safety and efficacy data on the use of combination MT with the React™ aspiration catheter and Solitaire™ device.

Disclosure of interest: Yes

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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Mechanical Thrombectomy with NIMBUS for Challenging Occlusions: Final Results of the SPERO Study

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Background and aims: The NIMBUS device was developed for challenging occlusions, specifically those due to tough clots which can yield suboptimal mechanical thrombectomy (MT) outcomes. The study aimed to evaluate NIMBUS in patients where the first one or two passes with another MT device did not achieve substantial reperfusion ⩾mTICI2b.

Methods: From October 2019-February 2022, the SPERO Study (NCT03898960, Cerenovus) enrolled 54 subjects at 11 European centres. Primary endpoint was core lab mTICI⩾2b after last NIMBUS pass (any MT technique allowed after 3 NIMBUS passes).

Results: NIMBUS was used after an average of 1.8 failed MT passes (24.1% and 75.9% after 1 and 2 passes, respectively) and achieved 52.9% with one pass and 68.6% mTICI⩾2b with a mean 2.2±1.13 passes (79.2% mTICI⩾2b, 37.7% mTICI⩾2c with 4.6±1.72 passes for all devices). There were no instances of ENT; 3.7% patients experienced 24hr-sICH. 90-day all-cause mortality was 18.5%. 90-day mRS⩽2 was 46.7%. When analyzing ability to retrieve any clot material, the rate of clot retrieval in first NIMBUS pass was 51.9% vs 27.8% in first procedural pass (non-NIMBUS). Compositional analysis confirming tough fibrin-rich clot retrieved by NIMBUS has been reported separately.

Conclusions: In a real-world setting, NIMBUS achieved nearly 70% substantial reperfusion in cases where the first one or two passes with another MT therapy were not successful. NIMBUS dislodged and retrieved nearly twice as many clots on its first attempt vs. the first pass of standard MT devices.

Disclosure of interest: Yes

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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FIRST PASS EFFECT, THROMBUS HISTOLOGICAL ANALYSIS AND IMAGING CHARACTERISTICS IN ENDOVASCULAR TREATMENT OF M1 OCCLUSION MIDDLE CEREBRAL ARTERY

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Background and aims: The first pass effect (FPE) has been etablished as a therapeutic goal in endovascular treatment of acute ischemic stroke mainly in patient with large vessel anterior occlusion. The purpose of this study was to correlate FPE achievement in patients with M1 occlusion treated with a direct aspiration technique (ADAPT) with JET7 catheter with functional outcome, clot histology and imaging thrombus characteristics on computed tomography (CT). The secondary endpoint was the relation between FPE and its effect on clinical outcome

Methods: We performed retrospective analysis of histological clot composition in patients with M1 occlusion middle cerebral artery (MCA) treated by direct aspiration from 2019 untill 2022. Thrombus CT charateristics like hyperdense middle cerebral artery sign (HMCAS), clot burden score (CBC), distance from internal carotid artery-terminus to thrombus (TTC), thrombus length and thrombus attenuation increase (TAI) were also evaluated.

Results: In the study period, a total of 62 patients underwent endovascular treatment of acute ischaemic stroke with M1 occlusion with a JET7 catheter using the ADAPT technique. 44 extracted thrombi were analysed histologically with imaging clot characteristics. FPE was significantly associated with good functional outcome mRs ⩽ 2. Clot histology, imaging characteristics and stroke etiology did not correlate with FPE.

Conclusions: The histological clot composition did not predict the likelihood of achieving FPE in patient with M1 occlusion treated with JET7 catheter with ADAPT. FPE was significantly associated with mRs ⩽ 2.
Disclosure of interest: Yes

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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Predictors of poor functional outcome in acute isolated proximal posterior cerebral artery occlusion with medical management alone. An international multicentric observational study

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Background and aims: Clinical and radiological factors associated with poor outcome in isolated proximal posterior cerebral artery (PCA) occlusions treated with best medical management (BMM) alone are poorly known.
Methods: We conducted an international retrospective study of stroke patients with isolated PCA occlusion (P1 or P2) admitted within 6hrs from onset in 26 stroke centers, who received BMM alone. Primary outcome was poor outcome defined as 3-month mRS⩾2. All baseline and follow-up imaging were read centrally. Associations between pretreatment clinical and radiological variables with poor outcome were studied in univariable then multivariable analyses.
Results: 597 patients were included: median age 74 years (IQR: 63-82); median NIHSS 6 (3-10), 80% received thrombolysis, 23% and 77% had P1 and P2 occlusion, respectively. Poor outcome occurred in 56% of patients. In multivariable analysis, were independently associated with poor outcome : age (OR=1.08 per 5-year increase; 95%CI 1.02-1.15; p=0.010), previous atrial fibrillation (OR=1.84; 95%CI 1.14-2.97; p=0.013), NIHSS (OR=1.13; 95%CI 1.09-1.18; p<0.001), thrombolysis use(OR=0.60; 95%CI 0.38-0.94; p=0.027) and infarct involving both superficial and deep regions (OR=1.81; 95%CI 1.26-2.61; p=0.002). On 24hr follow-up imaging, poor outcome occurred in 52% of patients without hemorrhage, 65% of patients with hemorrhagic infarction, and 78% of patients with parenchymal hemorrhage (p<0.001), and in 43% and 65% of patients with and without complete recanalization, respectively (p<0.001).
Conclusions: Poor outcome occurred in more than half of medically-treated PCA-related acute stroke patients, and several independent predictive factors were identified. Therapies reducing hemorrhagic complications and increasing recanalization may improve functional outcome.
Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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Quality of Life after Thrombolysis for Acute Ischemic Stroke in the AcT Trial

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Background and aims: Recent evidence from thrombolysis trials indicates the non-inferiority of the tenecteplase versus alteplase with respect to good functional outcomes in stroke patients. However, health-related quality of life (HRQOL) outcomes in these studies are less well-described. This study examines the predictors on HRQOL in acute stroke patients who received thrombolysis.
Methods: Data are from the Alteplase compared to tenecteplase (AcT) trial, a registry-based randomized clinical trial comparing tenecteplase with alteplase. HRQOL at 90-day post randomization was assessed using the EuroQol-5D-5L (EQ5D). EQ5D index values were estimated from the EQ5D items via time trade-off approach based on Canadian norms. Tobit regression and median regression models were used to evaluate the association between the type of treatment and EQ5D index and EQ5D Visual Analogue Scale (VAS) score, respectively, after adjusting for age, sex, NIHSS, type of registry, and onset-to-needle time.
Results: Of the 1503 included in this analysis, 769 (51.2%) were administered tenecteplase, 717 (48.8%) were female. The median (IQR) EQ5D index values for patients in the teneteplase and alteplase groups were 0.82(0.49) and 0.80(0.57), respectively. There were no significant associations between the type of thrombolysis and EQ5D index and VAS scores. But older age (p < 0.01), more severe stroke (p < 0.01), and longer

stroke onset-to-needle time ($p < 0.01$) were associated with lower EQ5D index and VAS scores.
Conclusions: Tenecteplase offer comparable HRQOL benefit as the alteplase in acute stroke patients. However, but there remains sex- and age-related disparities in HRQOL, regardless of the type of thrombolysis received.
Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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SAFETY OF GLENZOCIMAB ADMINISTRATION IN ACUTE ISCHEMIC STROKE PATIENTS TREATED WITH ANTIPLATELET AGENTS OR ANTICOAGULANT

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Background and aims: Glenzocimab, a humanized antibody fragment targeting platelet glycoprotein VI, was assessed in acute ischemic stroke (AIS) patients on top of alteplase. We analyzed the safety of glenzocimab in patients treated by antiplatelet agents or anticoagulants.
Methods: ACTIMIS (NCT03803007), a safety and efficacy, dose-finding clinical trial in AIS, encompassed an initial escalating dose phase, then a 1:1 randomization to placebo or glenzocimab 1000 mg associated with alteplase. The assessment of safety endpoints was conducted in subgroups where glenzocimab was associated with antiplatelet agents and/or anticoagulants with a special focus on intracranial hemrrohages, wether symptomatic (s-ICH) or non-symptomatic (ns-ICH), and mortality.
Results: Among 106 patients, 27 patients were treated by antiplatelet agents prior to and at study drug administration start (22 aspirin and 5 clopidogrel); and 82 patients were treated by anticoagulants, mostly prophylactic dose of low molecular weight heparins. No increased bleeding events were observed in the glenzocimab group. No safety signal associated with dual antithrombotic treatment was identified (see table 1).
Conclusions: Glenzocimab favorable safety profile was not impacted by drugs with a bleeding potential. Those results are indicative of the paradigm shift introduced by glenzocimab and opens to multiple new therapeutic strategies.

Disclosure of interest: Yes

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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ACTISAVE IN ACUTE ISCHEMIC STROKE, A PIVOTAL INTERNATIONAL PHASE 2/3 STUDY OF GLENZOCIMAB AS ADD-ON TO STANDARDS OF CARE, THROMBOLYSIS or THROMBOLYSIS PLUS THROMBECTOMY

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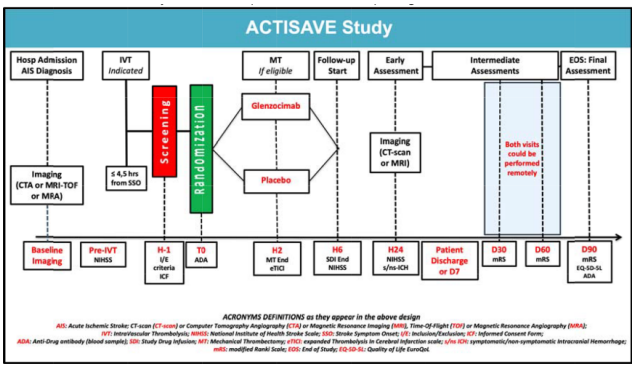
Background and aims: Glenzocimab, a monoclonal antibody fragment targeting platelet GPVI, is evaluated in the treatment of acute ischemic stroke (AIS). In ACTIMIS study (NCT03803007) it was observed to be safe with several efficacy trends, including mortality and in patients undergoing mechanical thrombectomy (MT).
ACTISAVE (NCT05070260) is a randomized, double blind, placebo controlled, single dose, adaptive, efficacy and safety study of glenzocimab used as an add-on therapy on top of standard of care in the 4.5 hours following an AIS.
Methods: The study is being launched in eight European countries, Israel, the USA in comprehensive and primary stroke centers. All 1000 patients expected in Overall Population (OP) will receive thrombolysis. Half will also receive Mechanical Thrombectomy (MT^+ Population).
The primary efficacy objective is to assess the efficacy of glenzocimab 1000 mg on at least one of the dual endpoint at day-90: the ordinal modified Rankin Scale (mRS) or the binary 'poor outcome' defined as a mRS 4-6, either in OP or in MT^+. Secondary objectives evaluate glenzocimab efficacy on all-cause mortality at day-90, favorable outcomes (mRS 0-1 and 0-2), NIHSS score at 24hrs, recanalization in MT and cerebral reperfusion. Safety evaluation includes symptomatic and non-symptomatic intracranial hemorrhages (s/nsICH).
An Independent Committee will perform two futility analyses respectively after 100 or 250 MT^+ patients have completed the study.
Results: The study recruitment started in September 2021. In January 2023, more than 200 patients (30% with MT^+) have been recruited.
Conclusions: ACTISAVE study results could open to new treatment paradigm in AIS.



Disclosure of interest: Yes

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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PROCEDURAL, CLINICAL AND SAFETY OUTCOMES IN ACUTE ISCHEMIC STROKE STRATIFIED BY OPERATOR TECHNIQUES AND CLOT LOCATION – INSIGHTS FROM THE ASSIST REGISTRY

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Background and aims: The ASSIST registry is a prospective, global registry that assessed clinical and procedural outcomes associated with various operator techniques for mechanical thrombectomy (MT) in acute ischemic stroke (AIS) patients with large vessel occlusion (LVO) where Stryker Neurovascular devices were used for the first pass. An analysis of the registry data aims to determine if procedural outcomes, including first-pass effectiveness, safety, and clinical outcomes, vary by clot location among the three MT techniques

Methods: ASSIST patients were grouped in three cohorts: Stent Retriever (SR) Classic [SR + Balloon Guide Catheter (BGC)], SR Combination [SR + Aspiration Catheter (AC) ± Pump + BCG or Long Sheath (LS)] and Direct Aspiration [AC ± Pump + BGC or LS]. The procedural endpoint of eTICI 2c or greater on the first pass was stratified by clot location (MCA-M1, MCA-M2 and ICA). Similar analyses were performed on the primary clinical endpoint (mRS 0-2 at Day 90) and other secondary and safety endpoints.

Results: A total of 1492 patients met the ASSIST eligibility criteria. First pass eTICI scores across the three different techniques, stratified by clot location, will be presented. Stratification by clot location will be also provided for other procedural, clinical and safety endpoints.

Conclusions: ASSIST provides insights into the effectiveness and safety of different MT techniques as stratified by clot location to improve reperfusion rates, functional outcomes and quality of life for AIS patients worldwide.

ClinicalTrials.gov ID: NCT03845491

Disclosure of interest: Yes

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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RUNNING ALTEPLASE INFUSION UPON FLOW RESTORATION WITH THROMBECTOMY: CAUSAL CLINICAL BENEFIT, MYTH, OR BIAS? A POST-HOC ANALYSIS OF THE SWIFT DIRECT TRIAL

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Background and aims: Pathophysiological considerations and observational data suggested that patients might particularly benefit from intravenous thrombolysis with alteplase (IVT) before thrombectomy if drug concentrations are therapeutic when flow-restoration is achieved. We aimed to study this hypothesis in patients randomized to IVT versus no IVT before thrombectomy.

Methods: Using SWIFT DIRECT data, we assessed treatment effect heterogeneity of IVT before thrombectomy in groups with running or finished IVT infusion upon flow restoration (IVT-to-flow-restoration interval ⩽/>60 minutes). To reduce bias associated with merely comparing patients with running versus finished IVT infusion, we imputed IVT time for patients without IVT and included them into analyses. Primary hypothesis was that IVT favors functional independence when IVT is running upon flow restoration.

Results: In patients receiving IVT, running IVT infusion upon flow restoration tended to be associated with higher rates of functional independence (73.0% vs 60.2%, aOR 0.63, 95% CI 0.31-1.25). Imputing IVT time for patients treated with MT alone, there was no significant treatment effect heterogeneity regarding the effect of IVT depending on whether IVT infusion was still running or had ended at the time point of flow-restoration (P for interaction= 0.63). Sensitivity analyses with different dichotomizations (e.g. 50/70 minutes) did not change these results.

Conclusions: In patients randomized to IVT or no IVT before MT, there was no treatment effect heterogeneity concerning overlapping IVT infusion at the time point of flow-restoration. This analysis suggest that running IVT infusion upon flow restoration may not be a causal factor promoting good outcomes.

Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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Magnetic Resonance Imaging versus Computed Tomography for Baseline Imaging Evaluation in Acute Large Artery Ischemic Stroke:a subanalysis of the SWIFT-DIRECT trial

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Background and aims: Whether baseline imaging modality (magnetic resonance imaging [MRI] versus computed tomography [CT]) modifies the treatment effect of combined intravenous thrombolysis (IVT) plus thrombectomy versus thrombectomy alone in patients with acute large vessel stroke remains unknown.
Methods: In this post-hoc analysis of the SWIFT-DIRECT trial investigating non-inferiority of thrombectomy alone versus IVT+thrombectomy in IVT-eligible patients, we assessed the effect of baseline imaging modality (MRI/MR angiography vs CT/CT-angiography) on workflow delays and pivotal outcome parameters. Regression models were adjusted for age, sex, baseline NIHSS, occlusion location, and Alberta Stroke Program Early CT Score (ASPECTS).
Results: 405 of 408 patients enrolled in SWIFT-DIRECT were included in this substudy. 200/49.4% patients underwent MRI/MR-angiography and 205/50.6% CT/CT-angiography. Patients with MRI/MR-angiography had lower NIHSS scores (16 [IQR, 12-20] vs 18 [IQR, 14-20], p=0.012) and lower ASPECTS (8 [IQR, 6-9] vs 8 [IQR, 7-9], p=0.021) compared to those with CT/CT-angiography. We found no evidence for an interaction between baseline imaging modality and the effect of IVT+thrombectomy versus thrombectomy alone. MRI/MR-angiography acquisition was associated with workflow delays of around 20 minutes, higher odds of functional independence at 90 days (adjusted odds ratio [aOR] 1.65, 95%CI 1.07-2.56) and similar mortality rates (aOR 0.73 95%CI 0.36-1.47) compared to CT/CT-angiography.
Conclusions: This post-hoc analysis does not suggest treatment effect heterogeneity of IVT+thrombectomy vs thrombectomy alone in large artery stroke patients with different imaging modalities. There was no evidence that functional outcome at 90 days was less favorable following MRI/MR-angiography at baseline compared to CT/CT-angiography, despite significant workflow delays.
Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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The associations between FLAIR vessel hyperintensities ASPECTS and clinical outcomes in stroke with unknown time of onset patients: The THAWS trial sub-analysis

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Background and aims: FLAIR vessel hyperintensities (FVH) ASPECTS is known to be an imaging marker for cerebral hemodynamics but its clinical implications are unclarified. We estimated the correlation between FVH-ASPECTS and clinical outcomes in stroke with unknown time of onset patients.
Methods: THAWS trial was a multicenter randomized trial. Patients with DWI-FLAIR mismatch were assigned to receive alteplase at 0.6 mg/kg or standard medical treatment. ROC analyses were performed to detect the FVH-ASPECTS for favorable outcomes (mRS 0-2 at 90 days). FVH-ASPECTS is a semiquantitative scoring system for evaluating FVH prominence (0 indicated the absence of FVH, and 7 suggested to be prominent). The achieved FVH-ASPECTS threshold was used for investigating the correlation with favorable outcomes.
Results: Of total, 131 patients (74±12 years old, 42% women) were included and 71 received alteplase and 60 in the non-alteplase group. Baseline DWI lesion was median (IQR) 1.1 (0-11.7) mL and median NIHSS was 7 (IQR 4-13). Ninety-three had wake-up stroke and the other 38 had daytime-unwitnessed stroke. Median FVH-ASPECTS was 4 (IQR 2-4). ROC analysis demonstrated ⩾3 as a favorable FVH-ASPECTS (sensitivity 80%, specificity 51%, area under curve 0.717) to achieve favorable outcomes. There was a significant correlation between FVH-ASPECTS and favorable outcomes (unadjusted OR 2.2, 95%CI 1.0-4.6, p=0.04) and with known covariates such as age and NIHSS (odds ratio 2.6, 95%CI 1.0-6.8, p=0.05).
Conclusions: FVH-ASPECTS could be an indicator for achieving clinical favorable outcome in stroke with unknown time of onset patients with a threshold of ⩾3.
Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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EFFECT MODIFICATION OF TREATMENT WITH TENECTEPLASE IN WAKE-UP STROKE BY PRESENCE OF MRI DWI/FLAIR MISMATCH OR CTP PENUMBRA: A SUBGROUP ANALYSIS OF THE TWIST TRIAL

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Background and aims: Current guidelines support the use of intravenous thrombolysis in wake-up ischemic stroke patients selected by MRI or perfusion imaging. We assessed whether MRI or CT perfusion (CTP) findings modified the treatment effect of tenecteplase in the open-label, randomized-controlled Tenecteplase in Wake-up Ischemic Stroke Trial (TWIST).

Methods: We performed a pre-specified subgroup analysis of TWIST which randomized 578 wake-up stroke patients to intravenous tenecteplase or no thrombolysis based on non-contrast CT (NCCT). In patients with additional baseline MRI or CTP, target mismatch (TM) criteria was defined as presence of MRI DWI/FLAIR mismatch or CTP penumbra.

Results: Images were available in 531 patients, 295 with NCCT only, 105 with TM and 131 without TM. Among patients with NCCT only, mRS score 0-1 at 90 days was achieved in 44% of patients treated with tenecteplase versus 36% in the control group, 48% versus 39% in patients with TM and 42% versus 44% in patients without TM. After adjustment for age, baseline NIHSS score and time from wake-up, no differences in treatment effect was found between imaging groups, with common odds ratio (cOR) of 1.20 (95% CI 0.79-1.80) in the NCCT group, 0.97 (95% CI 0.48-1.97) in the TM group and 0.98 (95% CI 0.52-1.84), p-value for interaction was 0.67. Exclusion of patients treated with thrombectomy changed the direction of the point estimate in patients with TM (adjusted cOR 1.30, CI 0.54-3.14).

Conclusions: DWI/FLAIR mismatch on MRI or penumbra on CTP did not modify treatment effect of tenecteplase in TWIST.

Disclosure of interest: Yes

PREVENTION

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I-REBOUND AFTER STROKE: A PILOT FEASIBILITY STUDY OF A CO-DESIGNED WEBSITE WITH RESOURCES TO REDUCE SECONDARY STROKE RISK

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Background and aims: Physical inactivity and poor diet quality are amongst the highest modifiable risk factors for recurrent stroke. Despite this, very few targeted resources are freely available to help survivors of stroke manage these ongoing risks. Our study aimed to test the feasibility and usability of a co-designed website that supports survivors of stroke to improve their diet quality and physical activity levels.

Methods: A pre-post, mixed methods, pilot study was conducted with survivors of stroke in August 2022. Fruit and vegetable consumption, activity behaviour and self-efficacy ratings for physical activity and diet quality were collected at baseline. Trial participants had unrestricted access for self-directed use of the i-REBOUND website over a 4-week period. The Bowens Feasibility framework was used to evaluate feasibility with domains of interest being 'Acceptability', 'Demand', and 'Limited Efficacy'. The System Usability Scale (SUS) was used to evaluate usability.

Results: Recruited survivors of stroke (n=42) were mostly female (56%) aged 30 to 80 years. Improvements in self-efficacy were reported in 2 domains relating to diet quality and in all 5 domains relating to physical activity. Participants reported changes in their eating habits (48%) and activity levels (57%) after using the i-REBOUND website and rated usability as 'above average' with a SUS score of 73. Participants found content on the website motivating and felt the i-REBOUND website was easy to navigate.

Conclusions: Our results indicated that tailored web platforms for secondary prevention are accessible to survivors of stroke and have the potential to facilitate behaviour change

Disclosure of interest: No

PREVENTION

715

Empowerment and mobile technology in the detection and treatment of main cardiovascular risk factors of patients with ischemic stroke or transient ischemic attack: A protocol for a multicenter randomized controlled trial and results of a pilot study

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Background and aims: Hypertension and atrial fibrillation (AF) are major treatable risk factors for ischemic stroke and transient ischemic attack (TIA). However, most of the patients with an ischemic stroke or TIA fail to reach desired blood pressure (BP) control and AF remains underdiagnosed with standard ECG monitoring. The aim of the CARDIOSTROKE study is to test the effect of 3-week non-invasive ECG monitoring combined with self-monitoring of BP and patient-controlled titration of antihypertensives over 12 months in patients with recent non-cardioembolic ischemic stroke or TIA.
Methods: CARDIOSTROKE is an investigator-initiated, multicenter, prospective trial aiming to randomize patients with recent ischemic stroke or TIA to receive in a 2:1 fashion either (1) standard diagnostic work-up and follow-up (control arm) or (2) 3-week ECG monitoring combined with self-monitoring of BP and mobile-device-assisted self-titration of antihypertensives (intervention arm). The co-primary outcomes are (1) mean reduction in systolic BP and (2) detection of new AF at 12 months.
Results: The pilot study consisted of patients in the intervention (8 patients) and control (19) arms. One patient in the intervention group and three in the control group were diagnosed with new-onset AF. Compared to the control arm, patients in the intervention arm showed a trend towards greater mean reduction of systolic BP (7.2±4.9 vs. 1.7±2.6 mmHg). No intervention-related major adverse events were observed.
Conclusions: Mobile technology assisted control of the two major risk factors of stroke recurrence was feasible in the pilot study, which supports conducting a full-scale randomized trial in this patient population.
Disclosure of interest: No

PREVENTION

1149

Intake reminders are effective in enhancing adherence to direct oral anticoagulants in stroke patients – primary analysis of the MAAESTRO study

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Background and aims: High adherence to direct oral anticoagulants (DOAC) is crucial for ischemic stroke prevention, but evidence for adherence-enhancing interventions is scarce. We investigated the effect of intake reminders on the adherence to DOAC among patients with atrial fibrillation (AF) and a recent ischemic stroke.
Methods: In MAAESTRO, a randomized, cross-over, 12-month-long trial in DOAC-treated AF-stroke patients, we measured adherence by electronic monitoring. After a 6-month observational phase, each participant received a pillbox and counseling session, and was randomized to 3 months of reminders-first or reminders-last during the subsequent 6-month interventional phase. Intake reminders were delivered by electronic devices with audio-visual alarms. The primary outcome was *100%-timing adherence, defined as 100% of doses taken within* ±6h(once-daily DOAC) or ±3h(twice-daily DOAC) around the median intake time. Secondary outcomes included *100%-taking adherence* (100% of doses taken) and overall timing and taking adherence (as continuous variables), analyzed using mixed-effects logistic regression.
Results: Between 01/2018 and 03/2022, we recruited 130 participants, of whom 88 were randomized and 84 eligible for analysis (mean age: 76.5 years, 39.3% women, median NIHSS 1). The primary outcome (*100%-timing adherence)* was reached in 10 patients using reminders, but in no patients without reminders, thus disallowing further statistical analysis. Reminders significantly improved adherence defined using an alternative 90%-threshold (timing: OR [95%-CI] 2.65 [1.05,6.69], p=0.039; taking: 3.06 [1.20,7.80], p=0.019). Overall adherence increased with versus without reminders (timing: median[IQR] 96%[85-98%] vs 92%[81-97%], p<0.01); taking 97%[90-99%] vs 94%[83-98%], p<0.01).
Conclusions: Intake reminders increased adherence to DOAC in patients with AF-related ischemic stroke.
Disclosure of interest: No

PREVENTION

1252

The Impact of Prior Antithrombotic use on Blood Viscosity in Cardioembolic Stroke with Non-Valvular Atrial Fibrillation

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Background and aims: To determine the impact of prior antithrombotic (antiplatelet and anticoagulant) use on BV in patients with cardioembolic stroke (CES) due to NVAF.
Methods: Patients with CES and NVAF were analyzed with the following inclusion criteria: 1) patients over 20 years of age admitted within five days of stroke onset; 2) ischemic stroke presumably due to an NVAF-derived embolus; 3) compatible cortical/subcortical lesion on brain computed tomography or magnetic resonance imaging; and 4) receiving antiplatelets within five days or anticoagulants within two days if previously medicated. From the screening of 195 patients (22% of the total stroke population during the study period), 160 were included for the final analysis.
Results: Eighty-nine patients (56%) were taking antithrombotics (antiplatelet, 57%; warfarin, 13%; NOACs, 30%) regularly. Compared to patients without previous antithrombotic use, those with previous antithrombotic use (antiplatelets, warfarin, and NOACs) were significantly associated with decreased systolic BV (SBV) and diastolic BV (DBV) (P<0.036). In multiple linear regression analysis, hematocrit (Hct) level and prior antithrombotic use was significantly associated with decreased SBV and DBV. In Hct-adjusted partial correlation analysis, prior uses of any antithrombotic agents were associated with decreased SBV (r<-0.270, P<0.015) and DBV (r<-0.183, P<0.044).
Conclusions: In conclusion, this study showed that prior antithrombotic use (antiplatelets, VKAs, and NOACs) was associated with decreased SBV and DBV in patients presenting with acute CES secondary to NVAF. Our results indicated that previous use of NOACs may be a useful hemorheological parameter in patients with acute CES due to NVAF.
Disclosure of interest: No

PREVENTION

1294

A feasibility study of an intervention to enhance self-management of prescribed medication for stroke secondary prevention

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Background and aims: Stroke secondary prevention by medication (SSPM) is highly recommended and associated with a reduced risk for a recurrent stroke. Nevertheless, adherence to SSPM has been reported to decline. Perceived understanding of information provided at hospital discharge has been identified as crucial for the continued use of the prescribed SSPM. This study aimed to explore the feasibility of a co-designed intervention to support patients' perceived understanding, knowledge, and adherence to prescribed medication. The intervention entailed an individualized structured discharge letter and the use of the person-centred communication method Teach Back for sharing information regarding SSPM at hospital.
Methods: Study participants were consecutively recruited at stroke care units in two separate university hospitals in Stockholm, one of which applied the intervention. Eligible were patients with stroke who were to be discharged home and referred to a neurorehabilitation team in primary care. Data were collected by questionnaires at one-week and three-months regarding the perceived understanding of medical treatment, knowledge about medical treatment, and medication adherence.
Results: Participants who received the intervention (n=17) reported a higher perceived understanding of the purpose for taking their medications (p=0.024) and how to take them (p=0.01) than participants who did not receive the intervention (n=21). No other statistically significant differences were found.
Conclusions: The results indicate that the use of a structured discharge letter and the Teach Back method at the discharge encounter positively impact the perceived understanding of information about medical treatment. A full-scale study, powered to detect all clinically important differences is warranted.
Disclosure of interest: No

PREVENTION

1381

EFFECT OF ORTHOSTATIC HYPOTENSION ON RECURRENT EVENTS AFTER STROKE OR TIA. RESULTS FROM NAILED STROKE TRIAL

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Background and aims: Fear of OH and a reported association with an increased risk of cardiovascular (CV) events may limit antihypertensive treatment after stroke/TIA. In the NAILED trial, systematic titration of antihypertensive treatment resulted in lower blood pressure (BP) and a reduction of CV events. Our aim was to assess 1) the association between OH and CV events or death in a stroke/TIA population and 2) the association between group allocation in NAILED and risk of OH during follow-up.
Methods: All patients with complete BP measurement at baseline in the NAILED trial were included (n=814). OH was defined as a drop in systolic BP$\geqslant$20 or diastolic BP$\geqslant$10 mmHg, one minute after standing from a seated position. The association between OH and a composite of Stroke, Myocardial infarction or death using an adjusted Cox regression model with OH as a time-varying variable. The association between group allocation (intervention vs control) and OH was assessed using logistic regression.
Results: During a mean follow-up time of 4.8 years, 35.3% had OH at some point. OH was not significantly associated with the composite outcome, HR: 1.11 (95% CI: 0.80 – 1.54). Allocation to the intervention group in NAILED was not associated with OH during follow-up, OR: 0.84 (95%CI: 0.62 – 1.13).
Conclusions: OH was not associated with an increased risk of CV events or death in this stroke/TIA population. Systematic titration of antihypertensive treatment did not increase the prevalence of OH compared to usual care. Thus, OH did not reduce the gain of antihypertensive treatment.
Disclosure of interest: No

PREVENTION

2235

Cerebral Small Vessel Disease in Ipsilateral Hemisphere to Significance of Intracranial Atherosclerotic Disease Associated with Stroke Risk

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Background and aims: Silent cerebral small vessel disease (CSVD) commonly exists in patients with symptomatic intracranial atherosclerotic disease (sICAD). We aimed to investigate whether the overall burden of CSVD might correlate with the risk of stroke relapse in patients with sICAD.
Methods: Patients with anterior-circulation sICAD (50-99% stenosis) were recruited in this cross-sectional study. Three CSVD imaging markers, cortical microinfarcts (CMIs), white matter hyperintensities (WMHs) and lacunes, were assessed in MRI and summed up to reflect the overall CSVD burden (dichotomized as none-to-mild and moderate-to-severe), in ipsilateral hemisphere to sICAD. All patients received standard medical treatment. The primary outcome was a composite of recurrent ischemic stroke in the same territory (SIT) and recurrent transient ischemic attack (TIA) that was probably relevant to ischemia in the same territory within 1 year.
Results: Among 83 sICAD patients (median age = 64 years, 62.7% males), 53 (63.9%) had none-to-mild and 30 (36.1%) had moderate-to-severe overall CSVD burden in the ipsilateral hemisphere to sICAD. The primary outcome occurred in 18 (21.7%) patients. More patients with moderate-to-severe CSVD were male and had history of hypertension and diabetes mellitus than otherwise (all $p < 0.05$). In multivariate Cox regression, patients with ipsilateral moderate-to-severe CSVD had significantly higher risk of SIT and recurrent TIA than those with none-to-mild CSVD (risk = 40.0 vs. 11.3%, adjusted hazard ratio [HR] = 4.30, 95% confidence intervals [CI] = 1.61-11.52; p = 0.004).
Conclusions: In patients with sICAD, an overall moderate-to-severe CSVD burden ipsilaterally was more prone to stroke relapse.
Disclosure of interest: No

PREVENTION

2275

Acute ischemic stroke severity and in-hospital outcomes among patients using oral anticoagulants

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Background and aims: Despite preventive antithrombotic treatment patients with atrial fibrillation may experience an acute stroke. The aim of this study was to compare the severity and in-hospital outcome of ischemic stroke (IS) patients with preceding vitamin K antagonists (VKA) or non-vitamin K antagonist oral anticoagulants (NOACs) treatment.
Methods: A prospective study of 49 patients with AF and acute IS, admitted to Neurology Clinic, University Hospital Pleven from January to December 2022 was done. They were divided into two groups according to the type of oral anticoagulant used. Stroke severity assessed by the National Institutes of Health Stroke Scale (NIHSS) score was defined as mild (NIHSS<=7), moderate (NIHSS 8-16) and severe (NIHSS>=17). Outcome at discharge was evaluated by modified Rankin scale (mRS).
Results: Out of the 49 IS patients, 55.1% (n=27) were using NOACs and 44.9% (n=22) were using VKA. In the VKA group 55% had a mild, 33 % of them had a moderate and 11 % had severe stroke. In the NOAC group 54% had mild, 32% had moderate and 14 % had severe stroke. In-hospital mortality was 12% (n=6) and favorable outcome (mRS 0-2) at discharge had 53% of IS survivors.
Conclusions: Though AF is associated with worse stroke and a higher rate of mortality, according to our study results, preadmission treatment with oral anticoagulant was found associated with less severe ischemic stroke and favorable outcome. Depending on the type of anticoagulation no significant differences in the severity and outcomes between VKA and NOACs groups was found.
Disclosure of interest: No

PREVENTION

2534

INFLUENCE OF STENT DESIGN ON MAJOR ADVERSE EVENTS AND RESTENOSIS RATE IN CAROTID ARTERY STENTING

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Background and aims: Carotid artery stenting (CAS) is one option for the treatment of atherosclerotic carotid artery disease. Technical characteristics such as stent design may influence the outcome of carotid artery stenting. The aim of this study was to compare the incidence of major adverse events (MAE) and restenosis rate between all types of stent designs and clinical outcome after CAS.
Methods: This was a single centre, open-label, retrospective study of patients with severe symptomatic or asymptomatic carotid atherosclerotic disease who underwent CAS during the study period, from January 2015 untill October 2022. Four different types of stents were used, open cell, closed cell, hybrid and double-layer stents. The primary outcome were incidence of MAE such as stroke, death or myocardial infarction. A secondary end-point were restenosis rate, reocclusion and all periprocedural complications during 30 days' follow-up.
Results: In the study period, 465 patients underwent CAS. Successful CAS was performed in 98, 1% of all cases. MAEs were reported only in the symptomatic group with a frequency of 1,37%, with no significant difference between stent types. Nondisabling stroke was reported in two asymptomatic patients (0,5%). Significant restenosis occurred in 1,7%, with the same frequency in all types of stents used.
Conclusions: CAS is safe and effective treatment option in patients with symptomatic and asymptomatic carotid artery disease. MAEs and restenosis rate was not significantly related to any type of stent used.
Disclosure of interest: No

PREVENTION

1041

Framingham risk score prediction at 12 months in the STAND-FIRM randomised control trial

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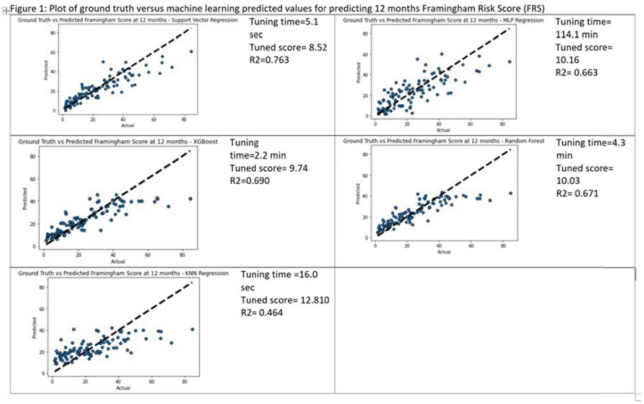
Background and aims: The Shared Team Approach between Nurses and Doctors For Improved Risk Factor Management (STAND-FIRM, ACTRN12608000166370) trial was designed to test the effectiveness of chronic disease care management for modifying the Framingham risk score (FRS) among patients with stroke or transient ischemic attack. The primary outcome of change in FRS between baseline and 12 months was not met. We aimed to determine study features at baseline that predict reduction in FRS at 12 months.
Methods: Data included 35 variables encompassing demographic, risk factors, psychological, social and education status, laboratory tests. Five supervised machine learning (ML) methods were used: random forest (RF), extreme gradient boosting (XGBoost), support vector regression (SVR), multilayer perceptron artificial neural network (MLP) and K-nearest neighbor (KNN). We split data for training (80%, n=406) and testing (20%, n=102).
Results: Training and test data were evenly matched for age, sex, baseline and 12-month FRS. Following tuning of the five ML methods, the optimal model for predicting FRS at 12 months was SVR (R2=0.763, root mean squared error or RMSE=8.52). Plots of model fit, R2 and RMSE are provided in Figure 1. The five most important variables for SVR were: baseline FRS, age, male sex, sodium/potassium excretion and proteinuria. The ML methods were poor at determining change in FRS at 12 months (R^2<0.15).
Conclusions: Support Vector Regression was the optimal method to predict future but not change in FRS. Our findings suggested that change in FRS as an endpoint in trials may have limited value.

Figure 1: Plot of ground truth versus machine learning predicted values for predicting 12 months Framingham Risk Score (FRS)



Disclosure of interest: Yes

PREVENTION

1299

Dyslipidemia and Its Treatment Are Associated with the Risk of Carotid Stenosis Being Classified as Symptomatic

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Background and aims: Dyslipidemia is a risk factor for carotid stenosis (CS). Lipid-lowering therapies are believed to reduce the risk of ischemic stroke arising from CS. We aimed to assess the association between dyslipidemia and lipid-lowering therapies with CS being symptomatic or asymptomatic.

Methods: Interim analysis of the ongoing prospective cohort study Atherogenic Lipoproteins in Ischemic Stroke (AGELESS) at the University Hospital Basel in Switzerland. In AGELESS, we are including patients with atherosclerotic extracranial carotid stenosis of 20-99% degree. CS is classified as either symptomatic (ipsilateral stroke or retinal ischemia) or asymptomatic.

Results: 168 patients with CS have been included since 2021, of which 55 were symptomatic (33 %), 113 asymptomatic (67 %). On admission for their index stroke, patients with symptomatic CS were taking less often lipid-lowering drugs and antiplatelet therapy compared to patients with asymptomatic CS at time of study enrollment (Table 1). Patients with symptomatic CS had higher LDL-C levels (2.41 mmol/l (IQR: 1.15-1.95) vs. 1.46 mmol/l (IQR: 1.17, 2.21), p<0.001). The probability of a CS being classified as symptomatic increased with increasing LDL-C levels (see Figure 1). Use of lipid-lowering drugs was associated with lower odds of the CS being classified as symptomatic, independent of baseline antiplatelet therapy use (adjusted OR 0.15, 95%CI 0.05-0.46, P<0.001).

Conclusions: Albeit not proving causality, these findings underscore the potential effect of contemporary lipid-lowering therapies to prevent asymptomatic CS from becoming symptomatic.

Table 1: *Baseline characteristics of patients with carotid stenosis, grouped in asymptomatic and symptomatic. All variables refer to the time of study inclusion, i.e. – among patients with symptomatic CS – on hospital admission for index stroke, and – among patients with asymptomatic CS – during a planned neurovascular consultation.*

	Overall (n= 168)	Asymptomatic (n=113)	Symptomatic (n=55)	p-value
Age (years), median (IQR)	76.0 (69.0, 81.0)	76.0 (71.0, 81.0)	76.5 (68.0, 81.8)	0.83
Women, n (%)	46 (27.4)	30 (26.5)	16 (29.1)	0.77
Laboratory parameters – median (IQR)				
LDL (mmol/L)	1.77 (1.24, 2.48)	1.46 (1.17, 2.21)	2.41 (1.83, 3.33)	**<0.001**
ApoB (g/L)	0.74 (0.56, 0.90)	0.70 (0.54, 0.82)	0.86 (0.66, 1.01)	**<0.001**
Cholesterol (mmol/L)	3.64 (3.15, 4.43)	3.89 (3.25, 4.76)	4.58 (3.70, 5.37)	**<0.001**
HDL (mmol/L)	1.29 (1.10, 1.57)	1.31 (1.12, 1.60)	1.23 (1.09, 1.43)	0.10
Non-HDL (mmol/L)	2.60 (1.80, 3.40)	2.30 (1.70, 2.90)	3.25 (2.57, 4.10)	**<0.001**
Triglycerides (mmol/L)	1.49 (1.08, 1.93)	1.45 (0.97, 1.90)	1.57 (1.15, 1.95)	0.39
Lipoprotein(a) (nmol/L)	24.50 (7.60, 137.00)	27.50 (9.00, 142.75)	15.45 (5.57, 100.25)	0.18
HbA1c, (%)	5.60 (5.50, 6.80)	5.60 (5.50, 6.10)	5.70 (5.47, 6.20)	0.73
Glucose (mmol/L)	5.70 (5.00, 6.80)	5.40 (4.90, 7.60)	5.85 (5.07, 6.70)	0.97
Creatinine (umol/L)	80.00 (70.00, 102.00)	85.00 (77.00, 104.00)	77.00 (76.00, 96.00)	0.10
CRP (mg/dl)	1.85 (1.02, 4.07)	1.30 (0.60, 3.20)	2.40 (1.20, 4.50)	**0.04**
Clinical history				
Diabetes, n (%)	34 (21.0)	22 (20.4)	12 (22.2)	0.84
Hypertension, n (%)	134 (82.2)	90 (82.6)	44 (81.5)	1.00
BMI, median (IQR)	25.30 (23.60, 27.85)	25.30 (23.70, 28.60)	25.25 (23.25, 27.48)	0.65
Metabolic syndrome, n (%)	15 (9.2)	10 (9.2)	7 (13.0)	1.00
Atrial fibrillation, n (%)	20 (12.3)	10 (9.3)	10 (18.5)	0.15
Coronary heart disease, n (%)	60 (36.8)	46 (42.2)	14 (25.9)	0.06
Heart Failure, n (%)	5 (3.1)	3 (2.8)	2 (3.7)	1.00
Peripheral artery disease, n (%)	26 (16.0)	11 (20.2)	4 (7.4)	0.06
Smoking, n (%)	44 (27.0)	30 (27.5)	14 (25.9)	0.60
OSAS, n (%)	14 (8.6)	10 (9.2)	4 (7.4)	0.88
Medication at Baseline, n (%)				
Lipid lowering medication	124 (73.8)	101 (89.4)	23 (41.8)	**<0.001**
Antiplatelet	122 (72.6)	95 (84.1)	27 (49.1)	**<0.001**
Anticoagulation	30 (17.9)	22 (19.5)	8 (14.6)	0.52
Antihypertensiva	130 (77.4)	91 (80.5)	39 (70.9)	0.17
Antidiabetics	39 (23.2)	26 (23.0)	13 (23.6)	1.00

Table Legend: ***IQR: interquartile range, HDL: high-density lipoprotein, LDL: low-density lipoprotein, apoB: apolipoprotein B, CRP: C-Reactive Protein, OSAS: obstructive sleep apnoea syndrome, BMI: body mass index.***

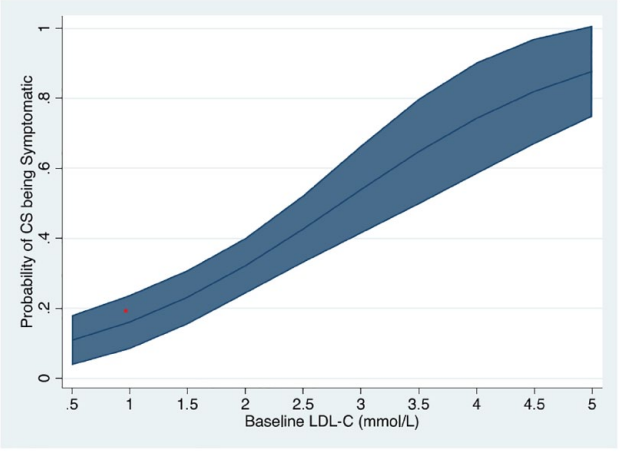

Figure 1: Estimated probability and 95% confidence interval of a patient with carotid stenosis being classified as symptomatic

Disclosure of interest: Yes

PREVENTION

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BLOOD PRESSURE LEVEL DURING LONG-TERM CILOSTAZOL-BASED DUAL ANTIPLATELET THERAPY AFTER STROKE IS ASSOCIATED WITH THE RISK OF RECURRENT ISCHEMIC STROKE: A CSPS.COM TRIAL POST-HOC ANALYSIS

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Background and aims: To determine the associations of follow-up systolic blood pressure (SBP) after stroke with the risk of subsequent ischemic stroke during long-term antiplatelet therapy including cilostazol.
Methods: Patients registered between 8-180 days after onset of high-risk non-cardioembolic ischemic stroke from the CSPS.com RCT (ClinicalTrials.gov NCT01995370), comparing aspirin or clopidogrel monotherapy versus additional cilostazol, were studied. SBP was observed up to 1 year after the last participant's start date. The primary outcome was recurrent ischemic stroke. For the association between SBP and the outcome, a Cox proportional hazards model was used with SBP as a time-dependent covariate. For the relationship between SBP and the effect of dual therapy, the hazard ratio (HR) curve for SBP of the two groups were estimated using a generalized additive model.
Results: 1,657 patients (age 69.5±9.3 years, female 29.1%, baseline BP 139.0±19.7/79.0±13.4 mmHg) received median 1.5-year follow-up. 74 patients developed the primary event. SBP was observed for median 5 times. The adjusted HR (aHR) of 10%-SBP increase from baseline was 1.19 (95% CI: 1.03-1.36), and that of 10-mmHg increase was 1.14 (1.03-1.28). With the baseline SBP as fixed time-independent covariate, the aHR of SBP was 1.14 (1.00-1.31). The estimated HR curve showed the benefit of dual therapy over a wide SBP range uniformly, with the greatest risk reduction in ≈140-160 mmHg.
Conclusions: Lower long-term SBP level after stroke was associated with the lower risk of recurrent ischemic stroke. Efficacy of dual antiplatelet therapy including cilostazol was more evident over a wide SBP range.
Disclosure of interest: Yes

PREVENTION

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PREDICTORS FOR UNDERLYING ATRIAL FIBRILLATION IN CRYPTOGENIC STROKE PATIENTS MONITORED WITH ICM IN THE NORDIC ATRIAL FIBRILLATION AND STROKE (NOR-FIB) STUDY

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Background and aims: Atrial fibrillation (AF) detection and the initiation of anticoagulation (OAC) are keys to preventing recurrence in cryptogenic stroke (CS) with underlying arrhythmia. Selection process to pre-clarify individuals at highest risk for underlying AF, who would profit the most of early insertable cardiac monitor (ICM) usage, as well as these with the lowest risk is essential when health resources are limited.
Methods: Multicenter international prospective observational study to detect and quantify underlying AF in CS and cryptogenic transient ischaemic attack (TIA) patients monitored by ICM, and to identify AF predicting biomarkers useful in clinical practice.
Results: Several clinical and paraclinical findings were associated with AF. In the univariate analysis increasing age, hypertension, left ventricle hypertrophy, dyslipidaemia, antiarrhythmic drugs usage, atrial cardiopathy signs, valvular heart disease, previous ischemic lesions on neuroimaging and large vessel occlusions were potential AF predictors. In the multivariate analysis, however, NT-proBNP and age performed best as AF predictors. Usability and utility of several AF predicting scores were tested: STAF, AS5F, Brown ESUS-AF, HAVOC, SURF, CHASE-LESS and HATCH. All the analyses showed significantly higher score levels for AF than non-AF patients. The STAF and the SURF scores predicted AF best (highest sensitivity and highest NPV), probably because of the significantly higher age of AF patients.
Conclusions: Occult AF in CS and TIA patients is common. Clinical risk scores may guide personalized evaluation approach in CS patients. Increasing the awareness on the usage of available AF predicting scores may optimize the arrhythmia detection pathway in stroke units.
Disclosure of interest: Yes

PREVENTION

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FUNCTIONAL OUTCOMES OF EARLY VS. LATE ANTICOAGULANT TREATMENT: A TIMING TRIAL SUBSTUDY

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Background and aims: The randomised Timing of Oral Anticoagulant Therapy in Acute Ischemic Stroke with Atrial Fibrillation (TIMING) study demonstrated initiation of Non-vitamin K Oral Anticoagulant (NOAC) treatment early (⩽4 days) after ischemic stroke to be noninferior to delayed (5-10 days), for the primary composite outcome of ischemic stroke, death or symptomatic intracerebral haemorrhage (NCT02961348). In this substudy, we compared the effect of early versus delayed NOAC initiation on functional outcome.

Methods: At the 90 days follow-up, patients reported their functional status according to a structured questionnaire. By a validated algorithm, answers were converted into modified Rankin Scale (mRS) scores, ranging from 0 (no stroke symptoms) to 6 (death). Difference in mRS (0-2, 3, 4, 5, 6) between the groups was analysed using ordinal logistic regression.

Results: Of the 888 patients in the TIMING study, 815 had data on mRS. Patients randomized to early start had numerically lower rates of mRS 5-6 at 90 days (Table/Figure). The odds ratio for favourable ordinal shift in mRS was 1.05 (95% CI 0.81-1.37) (Figure).

Conclusions: In patients with acute ischemic stroke and atrial fibrillation, timing of NOAC initiation did not significantly affect functional outcome.

Table. Modified Rankin Scale scores at 90 days by study group.

	0-2	3	4	5	6
Early (n=413)	233 (56.4%)	93 (22.5%)	49 (11.9%)	20 (4.8%)	18 (4.4%)
Delayed (n=402)	225 (56.0%)	86 (21.4%)	44 (10.9%)	28 (7.0%)	19 (4.7%)

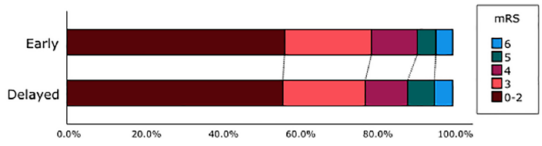

Figure. Modified Rankin Scale scores at 90 days

Disclosure of interest: No

PREVENTION

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TOWARDS INDIVIDUAL TREATMENT IN CERVICAL ARTERY DISSECTION - AN IN-DEPTH ANALYSIS OF THE TREAT-CAD RANDOMISED TRIAL

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Background and aims: Uncertainty remains about antithrombotic treatment in cervical artery dissection. This analysis aimed to explore if certain patient profiles influence the effects of different types of antithrombotic treatment.

Methods: This was a post-hoc exploratory analysis based on the per-protocol dataset from TREAT-CAD (NCT02046460), a randomised controlled trial comparing aspirin to anticoagulation in patients with cervical

artery dissection. We explored the potential effects of distinct patient profiles on outcomes in participants treated with either aspirin or anticoagulation. Profiles included (i) presenting with ischemia (no/yes), (ii) occlusion of the dissected artery (no/yes), (iii) early versus delayed treatment start (</>median), and (iv) intracranial extension of the dissection (no/yes). Outcome included clinical (stroke, major haemorrhage, death) and MRI-outcomes (new ischemic or haemorrhagic brain lesions) and were assessed for each subgroup in separate logistic models, including a test for interaction.

Results: All 173 participants (100%) of the TREAT-CAD per-protocol dataset were eligible for analyses. Participants without occlusion (OR 0.28 [95% CI 0.07-0.86]), had fewer outcome events if treated with anticoagulation than with aspirin. This effect was particularly present in participants presenting with ischemia (n=118) (OR 0.16 [95% CI 0.04-0.55]). Moreover, in participants presenting with ischemia, those with early treatment (OR 0.26 [95% CI 0.07-0.85]), and those without intracranial extension of the dissection (OR 0.34 [95% CI 0.11-0.97]) had less outcome events if treated with anticoagulation.

Conclusions: Whether anticoagulation is preferable in patients with cervical artery dissection presenting with ischemia and no occlusion or no intracranial extension of the dissection requires further research.

Disclosure of interest: No

PREVENTION

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Chronic ischemic lesions in young adults with embolic stroke of undetermined source and association with presence of patent foramen ovale

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Background and aims: Chronic ischemic lesions (CIL) are frequent incidental findings in patients with acute ischemic stroke, but their phenotypes and bearing in young adults with embolic stroke of undetermined source (Y-ESUS) patients remains uncertain. We aimed to compare Y-ESUS patients with additional CIL to those without and to assess the association of CIL with the presence of pathogenic patent foramen ovale (PFO).

Methods: This prospective, multicenter cohort study enrolled 535 consecutive patients 50 years and younger with a diagnosis of ESUS from 10/2017 to 10/2019 in 41 stroke centers in 13 countries. Local investigators adjudicated presence and phenotypes of CIL on clinically acquired brain imaging (either MRI or CT).

Results: 535 patients were enrolled (mean age 40.4 (SD 7.3) years, 238 (44%) female). CIL were present in 76/534(14.2%) patients with a mean CIL count of 2.0 (SD $\pm$ 2.8), 42/76 (55%) had at least one embolic phenotype and 38/76 (50%) at least one non-embolic phenotype. Overall, Y-ESUS patients with CIL were less often female (32% vs 47%), were older (mean 43y vs 40y), had more often hypertension (42% vs 19%), diabetes (17% vs 7%), and hyperlipidemia (34% vs 18%). CIL were independently associated with lower stroke recurrence (aRR 0.17(0.05-0.61). In patients with PFO, CIL were less frequent in probable pathogenic PFO than with probable non-pathogenic PFO (6.1% vs 30% P<0.001).

Conclusions: One in seven Y-ESUS patients has additional CIL. CIL were associated with several vascular risk factors, lower probability of a pathogenic PFO and lower stroke recurrence.

Disclosure of interest: No

REHABILITATION & RECOVERY

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Predicting change in physical activity after stroke

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Background and aims: Physical activity (PA) reduces the risk of stroke and improves functional outcome. We aimed to investigate predictors for decrease and increase in PA after stroke.

Methods: We used the Physical Activity Scale for the Elderly (PASE) questionnaire score for pre-stroke PA at inclusion and PA at six months. Main outcomes were decrease in PA to the lowest PASE score quartile from any higher, and increase from the lowest quartile to any higher. We created two cross validated, regularised, predictive models with available clinical variables.

Results: We included 522 patients from The Efficacy of Citalopram Treatment in Acute Ischemic Stroke (TALOS) trial. Median [IQR] age was 68 [59, 76], NIHSS score 3 [2, 5] and 180 (34%) were females. In total, 77 patients (19.7%) decreased in PA and 63 (48.1%) increased. The decrease model had sensitivity 0.862, specificity 0.290 and AUROC of 0.607. Variables used were increasing age, living alone, daily or occasionally smoking, hypertension, previous myocardial infarction and stroke severity. The increase model performed with sensitivity 0.882, specificity 0.246 and AUC at 0.606. Variables used were increasing age, female sex, living alone, excess alcohol intake, previous atrial fibrillation, hypertension, diabetes, peripheral arterial disease and pre-stroke mRS >0.

Conclusions: We found that change in PA after stroke is highly dynamic, and our prediction models performed only modestly, with baseline factors influencing both PA decrease and increase. These findings highlight the need for a systematic rehabilitation programme to avoid decrease and stimulate increased PA post stroke for all patients.

Disclosure of interest: No

REHABILITATION & RECOVERY

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ANXIETY AND PERCEIVED RECOVERY 3 AND 12 MONTHS POST STROKE. PART OF GOTVED STUDY

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Background and aims: One of common consequences of stroke is anxiety, which can affect up till 30% of stroke survivors. This togheter with other consequences after stroke may result in participation limitations and limitations in daily activities wich can affect patients perceived revcovery of stroke.

Aim: To analyze the association of anxiety and perceived recovery after stroke

Methods: A longitudinal study with data extracted from randomized controlled study of 140 participants. Study inclusion criteria; stroke diagnos according to World Health Organisation, age ⩾ 18 years, has data on anxiety and perceived stroke recovery 3 and/or 12 months post stroke. Outcome variable: perceived stroke recovery assessed by Stroke Impact Scale, anxiety, assessed by Hospital Anxiety and Depression scale. Participants at 3 and 12 months were dichotomized in anxiety (HADS-A ⩾8) and no anxiety group (HADS-A <8). In longitudinal analysis change of perceived stroke recovery from 3 to 12 months was calculated and trichotomized.

Results: There is significant association of anxiety and lower perceived stroke recovery at 3- and 12-months post stroke ($p<0.001$ and $p=0.018$). At 3 months 17.4% of participants experienced anxiety, while at 12 months 15.6% had anxiety. Those participants who had anxiety at 3- or 12-months post stroke, were more likely to experience positive change of recovery from 3 to 12 months

Conclusions: Those stroke survivors who experience anxiety after stroke, perceive their stroke recovery significantly lower than those with no anxiety. We suggest to increase attention towards patients' psychological well being to improve their perceived stroke recovery.

Disclosure of interest: No

REHABILITATION & RECOVERY

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Cost-effectiveness of MLC601 in post-stroke functional recovery compared with placebo

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Background and aims: Despite progress in revascularisation interventions (thrombolysis and/or thrombectomy), many stroke survivors have impairment of neurological function. We aimed to compare the cost-effectiveness of MLC601 compared to placebo in functional recovery after ischemic stroke.

Methods: Data was obtained from a previously published clinical trial of MLC601 in acute ischemic stroke. Patients with baseline NIH-Stroke-Scale score between 8-14, modified Rankin Scale (mRS) score ⩾2 at day-10, and with ⩾1 mRS assessment on follow-up were analysed. A Markov cohort model with a 3-month cycle length and time horizon of two years was developed to estimate the cost-effectiveness of MLC601 compared with placebo in post-stroke functional recovery (good outcome defined as mRS 0-1) from a health system perspective. The outcomes of interest were incremental cost, incremental quality-adjusted life-years (QALY) gained, and incremental cost-effectiveness ratio (ICER). Base-case analysis, one-way, and probabilistic sensitivity analyses were conducted. Subgroup analyses were also performed to explore the heterogeneity of patients with poor prognosis factors. All costs are expressed in 2022 Euros, and an annual discount rate of 3% was applied to costs and QALYs.

Results: Base-case analysis in 548 patients (placebo=261; MLC601=287) showed that MLC601 was cost-effective compared with placebo, with €5,080 saved and 0.45 QALY gained, resulting an ICER of -€11,352.50 per QALY gained. Similarly, results from subgroup analyses indicate that MLC601 was dominant in all subgroups. Sensitivity analyses revealed that results were robust.

Conclusions: Compared with placebo, MLC601 was cost-effective in post-stroke functional recovery over two years.

Disclosure of interest: No

REHABILITATION & RECOVERY

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Severity of delirium in acute stroke patients. Observational quality improvement study on a stroke unit implementing a standardized delirium management

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Background and aims: On stroke units (SU) delirium is relevant due to complications in rehabilitation for patients, professionals and health system [1, 2]. Standardized delirium programs are not established [3, 4]. The study analyzes the influence of implementing delirium management on delirium severity in patients with acute stroke [5].

Methods: A prospective, observational study on patients enrolled at a university hospital SU. The management includes the administration of a protocol. The primary outcome severity of post-stroke delirium was rated by Nu-DESC.

Results: In total 123 patients were included. The overall incidence was 10,6%. Delirium severity reduced after implementation; Nu-DESC arithmetic mean: prior 5.14 (standard deviation 1.92), post 3.48 (1.43), not significant (p=.055). Effect size showed high efficiency (d=.97).

Conclusions: Management may improve delirium severity. Standardized implementations tend to contribute to patient's outcome. Therefore, management should be established at SU. Further research is needed to investigate the potential in detail.

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Disclosure of interest: No

REHABILITATION & RECOVERY

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An ambulatory brain rehabilitation program after stroke: quasi-experimental study

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Background and aims: 60% of stroke patients are directly discharged home after hospital admission. These patients experience social, cognitive and emotional problems as well that may contribute to restriction in social participation. 40% of patients have functional decline in the years after stroke and 25% have another stroke. In cardiac patients, the benefits

of a multidisciplinary rehabilitation program focusing on physical exercise, health-related behavior, and socio-cognitive consequences have proven to be effective in reducing hospital admission, secondary prevention and case fatality. In the present pilot study, we studied the first effects and feasibility of a similar ambulatory brain rehabilitation program in post-stroke patients.
Methods: We performed an observational, prospective, quasi-experimental study, that recruited 54 stroke patients, of which 27 patients underwent a 12-week brain rehabilitation program (intervention group) and 27 received usual aftercare (control group). Primary outcome measures were global health (PROMIS-10), participation (USER-P) and feasibility at 3 months. Multivariable logistic or linear regression analyses were performed to adjust for age, sex and baseline NIHSS-score.
Results: We found that patients perceived more often good physical health in the intervention group than in the control group (aOR=4.12; 95%CI: 1.03-16.46). Participation was statistically significantly higher in the intervention group compared to the control group (aβ=7.81; 95%CI: 3.51-12.11). All patients completed the 12-week brain rehabilitation program.
Conclusions: Our results showed a 12-week brain rehabilitation program might increase physical health and participation in stroke patients who are directly discharged home and support further study.
Disclosure of interest: No

REHABILITATION & RECOVERY

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'MAKING A PATH IN THE SNOW', KEEPING NO-TREATMENT CONTROL PARTICIPANTS ON THE RESEARCH PATH IN THE HEADS: UP ONLINE PILOT RANDOMISED TRIAL

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Background and aims: Control design within randomised controlled trials (RCT) for psychological-based interventions is challenging. The 'no-treatment control' (NTC) design, while simple and cost-effective risks high drop-out due to participant reluctance at being denied a potentially therapeutic intervention. HEADS: UP (Helping Ease Anxiety and Depression after Stroke) is a mixed-methods online pilot RCT (protocol: NCT04985838). It aims to test a tailored adaptation of an existing psychological intervention to help stroke survivors self-manage symptoms of anxiety and depression. We aimed to mitigate NTC design limitations using a person-centred approach regardless of assigned group.
Methods: Enrolled participants' data collection comprised outcomes measures (OMs) and online focus groups/interviews (FGs) at the same time points. NTC retention strategies: we ensured randomisation strategy was understood at screening, offered online OMs, data collection text prompts, personalised contact e.g. Christmas cards, open access to research staff (telephone/email). Research staff implemented in-house training and debriefing.
Results: We randomised 62 UK community-dwelling participants (NTC n=32) with completed baseline OMs. Time 1 (3 months) NTC completion, n= 28/32 (87.5%), Time 3 (6 months) n=23/32 (71.87%).
FGs/interviews; Time 1, n=10/32 (31.25%), Time 3 n=5/32 (15.6%).
Qualitative data demonstrated an altruistic view of NTC participation "[It's like] walking ahead in the snow, we are making a path so those following us will find life easier because we've made that bit of effort."
Conclusions: This feasibility RCT indicates that a person-centred approach enhances NTC retention.
Disclosure of interest: No

REHABILITATION & RECOVERY

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The Effects of rTMS and tDCS Copuled With Robotic Therapy on Upper Extremity Functional Recovery in Patients With Chronic Stroke

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Background and aims: To investigate the effect of low-frequency repetitive transcranial magnetic stimulation and anodal transcranial direct current stimulation on upper extremity functional recovery in patients with chronic ischemic stroke who had functional disability in upper extremity.
Methods: A total of 36 chronic ischemic stroke patients included in the study. The participants were randomly allocated into active rTMS group (n=9), sham rTMS group (n=9), active tDAS group (n=9), and sham tDAS group (n=9). rTMS group received, 15 sessions of 1 Hz low-frequency active or sham rTMS therapy targeted to M1 area of the intact hemisphere; tDAS group received 15 sessions of anodal or sham tDAS therapy targeted to M1 area of the affected hemisphere. All four groups received robotic therapy immediately after non invasive brain stimulation.
Results: At the end of the study, active rTMS therapy or sham rTMS therapy coupled with robotic therapy in patients with chronic ischemic stroke was found effective in upper extremity motor function recovery and this lasted for 12 weeks ($p<0.05$). In active tDAS and sham tDAS groups, no significant upper extremity functional recovery was detected ($p>0.05$). Although the results upper extremity functional recovery was better in the active rTMS group compared to other groups, no statistical superiority was found ($p> 0.017$).
Conclusions: The rTMS and tDAS coupled with robotic therapy in patients with chronic ischemic stroke was not superior over only robotic therapy in upper extremity functional recovery, improvement in activities of daily living activities and reduction in spasticity.
Disclosure of interest: No

REHABILITATION & RECOVERY

2408

Causes and mechanisms of development of vascular parkinsonism after ischemic stroke

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Background and aims: In most cases, ischemic and hemorrhagic strokes are the main cause of vascular parkinsonism. The purpose of our work is to determine the degree of development of vascular parkinsonism after strokes.
Methods: In order to determine the level of development of vascular parkinsonism after strokes, we analyzed 123 patients who had ischemic strokes during our study. The mean age of the patients was 64,4±4,4, motor and non-motor symptoms of parkinsonism were compared in all patients. Patients were analyzed by gender. The first group consisted of 62 male patients, and the second group consisted of 61 female patients. The obtained data were statistically analyzed.
Results: It was found that the first group of patients had more rigidity, hypokinesia($p<0.05$) than the second group, and the second group had more tremors than the first group($p<0.01$). Plastic hypertonus was observed in male patients compared to female patients. Memory impairment was observed in 56% of male patients and 46% of female patients. When patients with parkinsonism syndrome were examined by MRI angiography, it was found that all of these patients had narrowing of the right middle cerebral artery ($p<0.01$)
Conclusions: we can conclude that ischemic stroke is the cause of the development of vascular parkinsonism, the main cause of which is a violation of blood circulation in the middle cerebral artery, vascular parkinsonism is more common in male patients than in women, in the early periods after ischemic stroke restoration of blood circulation reduces the likelihood of developing vascular parkinsonism.
Disclosure of interest: No

REHABILITATION & RECOVERY

2449

Long-term Outcome and Health-Related Quality of Life for People with Aphasia after Ischemic Stroke

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Background and aims: Knowledge regarding long-term outcome of aphasia and health-related quality of life (HRQoL) is needed to individualize rehabilitation for people with aphasia after ischemic stroke.
Methods: Consecutive patients with first-ever ischemic stroke admitted to Skåne University Hospital, Sweden were screened for aphasia at baseline (median day 4) with the Language Screening Test. At 1, 3, and 12 months after stroke onset people with aphasia (PWA) were evaluated with the Comprehensive Aphasia Test (CAT) concerning language and cognitive function. HRQoL was assessed with the self-reported Aphasia Impact Questionnaire (AIQ). We analyzed outcome of aphasia and associations between aphasia severity, stroke severity (NIHSS), and HRQoL.
Results: In the acute phase of stroke, 27% presented with aphasia (n=60 of 221). At 1 month after stroke onset, 74% (n=40 of 54 survivors with initial aphasia) had remaining aphasia, at 3 months 67% (n=34 of 51) had aphasia and at 12 months post stroke 61% (n=30 of 49) had remaining aphasia. At 12 months post stroke aphasia negatively affected communication (90%), participation (77%) and emotional well-being (83%) for PWA. HRQoL was significantly associated with aphasia severity even after adjusting for stroke severity and age.
Conclusions: Chronic aphasia was observed in 61% of all alive patients with baseline aphasia. Aphasia severity impacts HRQoL regardless of stroke severity. Aphasia continues to have large negative consequences for stroke patients.
Disclosure of interest: No

REHABILITATION & RECOVERY

2644

FEASIBILITY OF A SELF-MANAGEMENT INTERVENTION FOR IMPROVING MOBILITY FOR PATIENTS FOLLOWING STROKE IN THE COMMUNITY

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Background and aims: Self-management interventions have the potential to help stroke survivors to manage their rehabilitation after discharge from acute care. The aim of this study is to examine the feasibility of a self-management intervention to improve mobility in the community for stroke survivors.
Methods: A mixed methods design was used (a pilot randomised controlled trial and focus groups). Participants were adult stroke survivors within six months post stroke, with functional and cognitive ability to participate in self-management programmes. The intervention included education sessions, goal setting and action planning, group sessions, self-monitoring and follow up. The Control group received only education sessions. Participants assessed at baseline, three months and six months. The primary outcomes included feasibility outcomes and the secondary

outcomes included functional, cognitive, psychological, and general health outcomes relevant to walking. Data was analysed using descriptive analysis for the quantitative data and content analysis for the qualitative data.
Results: Twenty four participants were randomised (Intervention=12; Control=12) into the study groups. It was feasible to recruit participants from community. Randomisation and blinding were successful. There were some trends towards improvement in the functional and self-efficacy outcomes. Focus groups showed perceived improvements in rehabilitation outcomes, considering the programme as a very helpful and desirability to follow the programme after discharge.
Conclusions: The self-management intervention seems feasible for implementation for stroke survivors in the community. The study was not powered enough to draw a conclusion about the efficacy of the programme and a future full-scale study is warranted.
Disclosure of interest: No

REHABILITATION & RECOVERY

1017

THE EFFECT OF AEROBIC FITNESS TRAINING ON THE COURSE OF CEREBROVASCULAR RISK FACTORS OVER SIX MONTHS AFTER SUBACUTE STROKE – RESULTS FROM THE PHYS-STROKE STUDY

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Background and aims: Few randomized-controlled trials have investigated the effect of post-stroke aerobic fitness training on vascular risk factors, and they have yielded contradictory results.
Methods: Exploratory analysis of the randomized controlled, multicentre *PHYS-STROKE* trial. Stroke patients were randomized to either four weeks of aerobic fitness training or relaxation sessions early after stroke. Cerebrovascular risk factors (CVRF), i.e. systolic and diastolic blood pressure, fasting blood glucose, hbA1c, low-density and high-density cholesterol (LDL-C, HDL-C), and triglycerides were measured before and after the intervention period as well as three and six months after stroke. Generalized estimating equations (GEE) were used to evaluate the course of CVRF over six months. The effect of the intervention on CVRF post-intervention was estimated using GEE/ANCOVA controlled for baseline values and adjustments of pertinent medication.
Results: 167 patients participated in $\geqslant$ 15 (75%) sessions with a median acute NIHSS of 8 (IQR: 5; 12). Systolic and diastolic blood pressure showed a moderate improvement after intervention but rose again at three- and six-months post-stroke. Compared to baseline, HbA1c levels decreased after the intervention and at three months post-stroke (both $p < 0.05$) and HDL-C continuously increased during follow-up (all $p < 0.01$). LDL-C levels increased at six months post-stroke compared to baseline (Coef. 0.22 [CI: 0.08; 0.37]). Compared to relaxation, aerobic fitness training did not significantly improve any selected CVRF.
Conclusions: Except LDL-C, most CVRF improved during six months after stroke. The observed changes in CVRF did not differ between the aerobic fitness training and the relaxation group.
Disclosure of interest: No

ONGOING TRIALS

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Duration of Vasodilatory Action After Intra-arterial Infusions of Calcium Channel Blockers in Animal Model of Cerebral Vasospasm

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Background and aims: In medically refractory vasospasm, invasive intervention may be required. A commonly used approach is intra-arterial (IA) drug infusion. Although calcium channel blockers (CCBs) have been widely applied in this setting, studies comparing their efficacies and durations of action have been few. This study was performed to compare attributes of three CCBs (nicardipine, nimodipine, and verapamil), focusing on duration of the vasodilatory action based on angiography.
Methods: Vasospasm was produced in New Zealand white rabbits (N = 22) through experimentally induced subarachnoid hemorrhage and confirmed in each via conventional angiography, grouping them by IA-infused drug. After chemoangioplasty, angiography was performed hourly for 5 h to compare dilated and vasospastic arterial diameters. Drug efficacy, action duration, and changes in mean arterial pressure (relative to baseline) were analyzed by group.
Results: Effective vasodilation was evident in all three groups immediately after IA drug infusion. The vasodilative effects of nimodipine and nicardipine peaked at 1 h and were sustained at 2 h, returning to initial vasospastic states at 3 h. In verapamil recipients, effects were more transient by comparison, entirely dissipating at 1 h. Only the nicardipine group showed a significant 3-h period of lowered blood pressure.
Conclusions: Although nimodipine and nicardipine proved longer acting than verapamil in terms of vasodilation, their effects weren't sustained beyond 2 h after IA infusion. Further study is required to confirm the vasodilatory duration of IA CCB based on perfusion status, and an effort should be made to find new alternative to extend the duration.
Disclosure of interest: No

ONGOING TRIALS

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Comparative Analysis of the Vasodilatory Effects of Enteral Nimodipine and Tadalafil in an Animal Model of Cerebral Vasospasm

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Background and aims: Cerebral vasospasm is one of the most fatal complications after spontaneous subarachnoid hemorrhage. Phosphodiesterase isoenzyme 5 inhibitor, which is used to treat erection

dysfunction, was known to have cerebral vasodilation and neuroprotection effect. It could also be used to prevent vasospasm. In this study, tadalafil, one of Phosphodiesterase isoenzyme 5 inhibitors, was used to compare the preventive effect of cerebral vasospasm with nimodipine in subarachnoid hemorrhage rabbit model.

Methods: A total of 37 rabbits were used to make subarachnoid hemorrhage model and were divided into three groups - a control group, nimodipine group, and tadalafil group. The cerebral vessels were angiographically measured before and on the third day of subarachnoid hemorrhage. Then vertebrobasilar arteries were harvested and evaluated. Under the microscope, lumen area and media area were measured for each group and were compared.

Results: Angiographically, tadalafil group showed significant vasodilation compared with the C-group ($p<0.01$). Histologically, tadalafil group showed a similar effect on lumen and on media area to that of nimodipine group compared with the control group.

Conclusions: Cerebral vasospasm could leave neurologic deficit or sequelae even after proper treatment. Therefore, prevention is important. Tadalafil showed preventive effect against cerebral vasospasm and vasodilative effect similar to that of nimodipine. Therefore, tadalafil could be considered an alternative preventive treatment of cerebral vasospasm.

Disclosure of interest: No

ONGOING TRIALS

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INTENSIVE AMBULANCE-DELIVERED BLOOD PRESSURE REDUCTION IN HYPER-ACUTE STROKE TRIAL (INTERACT4): PROGRESS UPDATE AND BASELINE FEATURES OF 1387 PATIENTS

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Background and aims: As uncertainty existing on the effects of pre-hospital (ambulance) initiated blood pressure (BP) lowering, we are conducting the INTEnsive ambulance-delivered blood pressure Reduction in hyper-Acute stroke Trial (INTERACT4) to determine the effectiveness and safety of intensive BP lowering in patients with suspected acute stroke.

Methods: An ongoing multi-centre, ambulance-delivered, prospective, randomised, open-label, blinded endpoint trial of pre-hospital BP lowering in hypertensive patients with suspected acute stroke in regions of China. Patients are randomised through a mobile phone digital system to intensive (target systolic BP (SBP) $<$140mmHg within 30 min) or guideline-recommended BP management. Primary outcome is an ordinal analysis of the modified Rankin scale scores at 90 days.

Results: Between March 2020 and August 2022, 1387 patients (mean age 70.1 years, female 37%) were recruited, with 44.4% haemorrhagic stroke and baseline mean SBP 178/99 mmHg. SBP at hospital admission was 159mmHg and 171mmHg in intensive and control groups (Δ12 mmHg), respectively. The independent DSMB has recommended continuation of the trial as no safety concerns have been identified to date. The sample size has been reduced from 3116 to 2320 as the stroke mimic rate is lower than expected (6% vs. 30%). We expect to complete the study in late 2023.

Conclusions: INTERACT4 will provide reliable evidence on the effectiveness and safety of intensive ambulance-delivered hyper-acute BP lowering in patients with suspected acute stroke.

Trial registration: ClinicalTrials.gov NCT03790800. Registered on 2 January 2019; Chinese Trial Registry ChiCTR1900020534. Registered on 7 January 2019.

Disclosure of interest: No

ONGOING TRIALS

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A RANDOMIZED TRIAL ON HEMODYNAMIC OPTIMIZATION OF CEREBRAL PERFUSION AFTER ENDOVASCULAR THERAPY IN PATIENTS WITH ACUTE ISCHEMIC STROKE (HOPE STUDY)

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Background and aims: After mechanical thrombectomy (MT) less than half of the patients with large vessel intracranial occlusion (LVO) achieve functional independence. Optimization of blood pressure (BP) after MT could improve clinical outcomes by improving cerebral perfusion and preventing cerebral bleeding and edema.

Methods: ClinicalTrials.gov Identifier: NCT04892511. Standard BP management will be compared with BP targets according to the degree of recanalization, as measured by the TICI (Thrombolysis in Cerebral

Infarction) scale after successful MT (TICI 2b, 2c or 3). The study design corresponds to a multicenter Prospective Randomized Open, Blinded End-point (PROBE) study. A total of 814 patients with LVO will be allocated to either receive standard treatment (routine local BP management) or hemodynamic optimization, which includes: 1) BP lowering during the 72 hours following MT with different targets according to the TICI score: Intensive (100-140 mmHg systolic BP) after TICI 2c/3; or moderate (140-159mmHg systolic BP) after TICI 2b; 2) Induced hypertension (with isotonic saline serum and intravenous phenylephrine) to reach the desired target if needed .

Primary end-point: Functional outcome assessed by the Rankin scale score at 3 months by a blinded investigator. We will perform a shift analysis to demonstrate differences on the mRS score distribution between both groups. We will compare also the common odds ratio of worsening 1 point on the mRS score between groups using ordinal logistic regression.

Results: We expect to have them in 2024

Conclusions: Protocolised management of BP after MT may improve clinical outcomes.

Disclosure of interest: No

ONGOING TRIALS

719

The NIH StrokeNet Trials Implementation

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Background and aims: The NIH StrokeNet infrastructure consists of the National Coordinating Center at the University of Cincinnati; the National Data Management Center at the Medical University of South Carolina; 24 Regional Coordinating Centers that manage the network sites; and the National Institute of Neurological Disorders and Stroke that provides administrative and scientific input. There are 408 sites that have participated in StrokeNet studies since its inception, 314 network and 94 out-of-network sites. The StrokeNet central Institutional Review Board (cIRB) and a commercial cIRB are used for human subjects' protection. A Training and Education Core provides education and mentoring to the StrokeNet fellows.

Methods: StrokeNet's evolving trial submission and review process have been a high priority of network development. Attention is now focused on implementing trials that have been developed and funded through the review process.

Results: There have been 146 unique concept proposals (Acute-55, Prevention-58, Recovery-33) discussed by StrokeNet investigators, 67 have been approved for scientific review with all having feasibility assessments done prior to submission. The first StrokeNet trial, DEFUSE 3, was halted early by the DSMB for overwhelming efficacy. TeleRehabilitation finished on schedule. MOST, Sleep SMART, TRANSPORT2, I-ACQUIRE, SATURN, SATURN-MRI, ASPIRE, FASTEST, CAPTIVA, and VERIFY studies are currently enrolling. Recently, ARCADIA and ARCADIA-CSI enrollments have been paused for non-safety issues. RHAPSODY-2, FOCAS, CAPTIVA-MRI, and the STEP platform will commence enrollment in 2023.

Conclusions: The NIH StrokeNet has demonstrated the ability to design and implement innovative and impactful stroke trials and respond to unprecedented events such as COVID-19.

Disclosure of interest: No

ONGOING TRIALS

904

rFVIIa FOR ACUTE HEMORRHAGIC STROKE ADMINISTERED AT EARLIEST TIME (FASTEST) TRIAL

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Background and aims: The objective of FASTEST Trial (NCT03496883) is to establish the first treatment for acute spontaneous ICH. The central hypothesis is that recombinant factor VIIa (rFVIIa) administered within 120 minutes from stroke onset with an identified subgroup of participants most likely to benefit will improve outcomes at 180 days.

Methods: Phase III, randomized, double-blind controlled trial of rFVIIa plus best standard therapy vs. placebo and best standard therapy alone. Participants with a volume of ICH $\geq$ 2 and $<$ 60 cc, no more than a small volume of IVH (IVH score $\leq$ 7), age $\geq$ 18 and $\leq$ 80, GCS of $\geq$ 8, and treated within 120 minutes from stroke onset will be included. FASTEST will include approximately 100 hospital sites including approximately 15 MSUs with recruitment of 860 participants over 3½ years is planned. Countries participating in the trial include the U.S., Canada, Japan, Germany, Spain, and the U.K.

Results: Participants are randomized in a double-blinded fashion to rFVIIa 80 μg/kg dose (maximum 10 mg dose) or placebo. The primary outcome (mRS) is determined at 180 days, with additional assessments at 30 days and 90 days. To measure growth of ICH, all participants have a baseline non-contrast CT of the head and a repeat scan at 24 hours. Centralized volumetric measurements of ICH, IVH, and edema are performed for both time points.

Conclusions: As of 1/13/2023, 90 participants have been enrolled with a per-month enrollment rate of 22 per month over last two months (56 active sites).

Disclosure of interest: No

ONGOING TRIALS

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APPENDAGE CLOSURE, A SAFE AND EFFECTIVE ALTERNATIVE TO THE ANTICOAGULATION DILEMMA IN PATIENTS WITH INTRACRANIAL HEMORRHAGE

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Background and aims: The decision to anticoagulate patients at high embolic risk, who also present intracranial hemorrhage (IH), is a frequent challenge.
Atrial fibrillation (AF) is the most common cardiac arrhythmia and is present in up to 30% of patients with IH, the need for anticoagulation in these patients and weighing the increased risk of bleeding recurrence is not an uncommon dilemma. Percutaneous left atrial appendage closure (LAAC) is a safe and effective alternative in patients with an indication for the prevention of cardioembolic events and a contraindication for prolonged anticoagulation.
Methods: We report our experience analyzing retrospective cases of patients with AF and indication for anticoagulation who underwent LAAC between 2009 and 2020 at the Hospital de Salamanca.
Results: Out of 397 patients, the indication for IH was in second place (28%). Complete atrial appendage occlusion was achieved in 380 patients (96%). There were 3 deaths (0.8%), 1 transient ischemic stroke (0.3%), 10 patients (2.5%) suffered local bleeding. Evaluating the long-term results, the annual incidence of ischemic events was 0.6%, showing an absolute risk reduction (ARR) of 5.9% and a relative risk reduction (RRR) of 90.3% with respect to the events estimated by the CHA2DS2-VASC score. In relation to bleeding, the annual incidence recorded was 4%, with an ARR of 3.4% and a RRR of 45% compared to the HASBLED scale estimate
Conclusions: LAAC is a safe technique, presenting few periprocedural complications, and effective both in reducing embolic risk and in reducing bleeding recurrence.
Disclosure of interest: No

ONGOING TRIALS

1420

Unveiling the cost of Acute Stroke Care in Latin America: a comprehensive analysis

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Background and aims: Stroke has an important social and economic impact worldwide. Low and middle-income countries are particularly affected by the high costs of new technologies and treatments related to acute and post-acute stroke and increased indirect costs associated with loss of productivity, caregiver expenses, and institutionalization.
The study aims to assess the real-world costs and outcomes of acute ischemic stroke treatment through accurate costing methods, validate a standard set to drive the cost data collection and outcomes among the acute ischemic stroke care pathway across different countries, and determine the cost-effectiveness of acute ischemic stroke treatment strategies in the same country.
Methods: This is an economic evaluation, and data from stroke patients hospitalized from October 2021 to December 2023 will be collected through accurate costing methods and a standardized data spreadsheet. Approximately 10 high-volume stroke hospitals in Latin America will participate. Cost-effectiveness analysis will be performed to compare different treatment strategies in selected centers in the same country.
Results: Data collection is ongoing.
Conclusions: The results could contribute to better allocating and optimizing resources and implementing treatment strategies to improve patients' outcomes in the stroke care pathway. We also expect that this study could potentially encourage changes in National Health Policies, reducing the costs and the morbimortality of stroke in Latin America.
Disclosure of interest: No

ONGOING TRIALS

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TRIPLE THERAPY PREVENTION OF RECURRENT INTRACEREBRAL DISEASE EVENTS TRIAL (TRIDENT): PROGRESS REPORT

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Background and aims: Patients who suffer intracerebral haemorrhage (ICH) are at very high-risk of recurrent ICH and other serious cardiovascular events. A single-pill combination (SPC) of blood pressure (BP) lowering drugs offers a potentially powerful but simple strategy to optimise

secondary prevention. TRIDENT aims to determine the effects of a novel SPC 'Triple Pill', three generic antihypertensive drugs with demonstrated efficacy and complementary mechanisms of action at half standard dose (telmisartan 20mg, amlodipine 2.5mg, indapamide 1.25mg), with placebo, for the prevention of recurrent stroke, cardiovascular events, and cognitive impairment after ICH.

Methods: An international, double-blind, placebo-controlled, randomised trial in adults with ICH and mild-moderate hypertension (systolic BP 130-160mmHg), who are not taking any Triple Pill component drug or equivalent at greater than half-dose. 1500 randomised patients will provide 90% power to detect a hazard ratio of 0.5, over an average follow-up of 3 years, according to a total primary event rate (any stroke) of 12% in the control arm and other assumptions. Secondary outcomes include recurrent ICH, cardiovascular events, disability, cognitive impairment/dementia, burden of cerebral small vessel disease on MRI and safety.

Results: Recruitment started 28 September 2017. Up to 31 December 2022, 1135 patients have been randomised at 55 active sites in 10 countries. Mean triple pill adherence after 30 months is 81%. The required sample size should be achieved by December 2023

Conclusions: Low-dose Triple Pill BP lowering could improve long-term outcome from ICH.

Trial registration: ClinicalTrials.gov (NCT02699645)

(N=240)

Disclosure of interest: No

ONGOING TRIALS

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TENECTEPLASE IN CENTRAL RETINAL ARTERY OCCLUSION STUDY - TENCRAOS:A PROSPECTIVE, RANDOMISED-CONTROLLED, DOUBLE-DUMMY, DOUBLE-BLIND PHASE 3 MULTI-CENTRE TRIAL (NCT04526951)

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Background and aims: Central retinal artery occlusion (CRAO) is an ophthalmologic emergency that, without prompt reperfusion, bears high risk of permanent blindness. No evidence-based treatment is currently available. Whether prompt reperfusion with thrombolytic agents can improve the outcome in CRAO, as proved in ischemic stroke, remains unanswered. The main aim is to assess the effect of systemic tenecteplase within 4.5 hours of onset of central retinal artery occlusion

Methods: The trial is an ongoing prospective, randomised-controlled, double-dummy, double-blind phase 3 multi-centre trial of TNK 0.25 mg/kg + placebo vs. ASA + placebo (2 arms with 1:1 block randomisation). Patients are recruited after an ophthalmologist has confirmed CRAO and they can be treated within 4.5hrs. After observation in the stroke unit, patients will be re-examined by an ophthalmologist and a neurologist as an out-patient at 30 and 90-day follow-up.

The primary outcome is the proportion of patients with $\leqslant$ 0.7 logMAR best-corrected visual acuity (BCVA) in the affected eye at 30 days after treatment, representing an improvement in BCVA of at least 0.3 logMAR.

Results: 9 countries are participating with 28 centres already activated, and up towards 40 possible sites. Currently there are 6 countries activated for recruitment. We have recruited 28 patients so far, 14 in Norway, 9 in Finland, 3 in Denmark and 2 in Lithuania. Updated figures will be presented.

Conclusions: Inclusion will continue until 78 patients have been randomized. All patients have been included within the strict parameters of the study without any serious adverse events.

Disclosure of interest: No

ONGOING TRIALS

2023

EFFICACY AND SAFETY OF INJECTION TENECTEPLASE IN 4.5 TO 24 HOURS IMAGING ELIGIBLE WINDOW PATIENTS WITH ACUTE ISCHEMIC STROKE (EAST-AIS)

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Background and aims: Stroke is second major cause of disability and third most common cause of mortality in India. Rate of thrombolysis within 4.5 hours onset is$<$5% worldwide including India. This study is conducted to evaluate the safety and efficacy of injection Tenecteplase in AIS patients (with or without large vessel occlusion) in the time window 4.5-24 hours of stroke onset.

Methods: This study is prospective Randomized Controlled Trial approved by Institute Ethics Committee. Patients included will be male and female with age $>$18 years, baseline NIHSS$>$5, pre-stroke mRS$<$2 and CT-perfusion showing penumbra-ischemic core ratio $>$1.8, absolute difference in volume $>$10 ml, and ischemic-core volume $<$70 ml. A total of 100 patients will be enrolled, 50 each in Tenecteplase-arm (0.25mg/kg bodyweight; maximum 25mg) and placebo-arm in a ratio of 1:1. An independent data safety and monitoring board will have regular oversight of study. A total of ten patients have been randomized in the trial till date.

Results: Unmasking of treatment allocation was done due to adverse events. Five patients were randomized in the active drug, Tenecteplase group and five patients in the control group. Intracranial haemorrhage (ICH) and symptomatic ICH (two in active group and one in control group), decompressive hemicraniectomy (three in active group and two in

control group), infarct growth (one in active group and two in control group), death (two in active group) was observed.
Conclusions: It is an ongoing trial; an interim analysis shall be done again after 25 patients have been randomized in the trial.
Disclosure of interest: No

ONGOING TRIALS

2035

CONVINCE: COLCHICINE FOR THE PREVENTION OF VASCULAR INFLAMMATION IN NON-CARDIOEMBOLIC STROKE - A RANDOMISED CONTROLLED TRIAL

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Background and aims: Recurrent stroke and coronary events occur in 30% of patients at 5 years, despite contemporary medical therapies. Inflammation is an important contributor to residual risk, and randomised trials have shown benefit of anti-inflammatory agents in coronary disease. CONVINCE is investigating if the pleiotropic anti-inflammatory agent colchicine prevents recurrent vascular events after stroke.
Methods: CONVINCE is a prospective open-label blinded endpoint-assessed randomised clinical trial, including patients with non-severe non-cardioembolic stroke or high-risk TIA to guideline-based usual-care or colchicine 0.5mg daily in addition to usual care. Participants are followed for a median of 36 months. The primary outcome is a composite of non-fatal recurrent ischaemic stroke, myocardial infarction, non-fatal cardiac arrest, hospitalisation for unstable angina or vascular death.
Results: CONVINCE completed recruitment of the target sample-size of 3,154 in November 2022. Participants have been recruited across 152 sites in 14 countries in Europe and Canada, with 88% randomised in UK, Ireland, Belgium, Germany, and Spain. Mean age of participants is 66.4years (SD 9.5), median CRP is 3mg/L (IQR 1-6), mean LDL is 3.16mmol/L (SD 4.33). 58.3% of participants are on concomitant single antiplatelet therapy, 37.8% on dual antiplatelets and 93% on statins. 246 outcomes have been reported to date. Non-adherence rates are 19%. No excess Serious Adverse Events attributable to colchicine have been observed.
Conclusions: CONVINCE will provide high-quality randomised evidence about the benefit and safety of low-dose colchicine to prevent recurrent stroke and major vascular events after non-severe, non-cardioembolic ischaemic stroke. Final results will be presented in 2024.
Disclosure of interest: No

ONGOING TRIALS

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USE OF DOAC DIPSTICK POINT-OF-CARE-TESTING IN PATIENTS WITH ACUTE STROKE AND TRANSIENT ISCHEMIC ATTACK

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Background and aims: In acute stroke or transient ischemic attack (TIA), rapid information about the plasma concentration of direct oral anticoagulants (DOAC) is important for treatment decisions such as systemic thrombolysis, endovascular therapy or antidote administration in case of hemorrhagic stroke. Standard coagulation assays are either not reliable in detecting DOACs. Specific quantitative DOAC tests have long turn-around times, therefore point-of-care-testing with DOAC dipstick may be of additional value in this setting. This bi-center observational prospective study aims to test the feasibility of the DOAC dipstick under real-life conditions in a stroke unit.
Methods: About 250 patients with clinical suspicion of acute stroke or TIA within the past 24 hours, aged ⩾18 years, admitted to the emergency care units at two centers will be included into the study after having obtained written informed consent. Biographic data, therapeutic interventions, global coagulation tests and specific chromogenic substrate assays, routine clinical chemistry and DOAC Dipstick tests are documented or measured as soon as possible and within a maximum of eight hours after admission to hospital. DOAC Dipstick results are obtained from urine samples analyzed immediately after sampling. Colors of the specific factor Xa and thrombin inhibitor pads are analyzed visually and by an automated optoelectronic reader for presence or absence of DOACs. Additionally, comparability of visual and reader results of DOAC Dipstick will be investigated. Data will be analyzed by SAS software for primary outcome and for interfering factors.
Results: Preliminary results of this on-going study will be presented at the conference.
Conclusions: Disclosure of interest: Yes

ONGOING TRIALS

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DESIGN OF DAISY, A TWO-PART, PHASE 2B, PLACEBO-CONTROLLED RANDOMISED TRIAL OF THE EFFICACY AND SAFETY OF BIIB131 ADMINISTERED 4.5–24 HOURS AFTER ISCHAEMIC STROKE

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Background and aims: Thrombolytics with improved efficacy and safety within a wider therapeutic time window are needed for acute ischaemic stroke (AIS) treatment. BIIB131 (TMS-007) uniquely induces thrombolysis by promoting plasminogen-fibrin binding with potential anti-inflammatory properties. BIIB131 showed significant tissue reperfusion and reduced bleeding rates in animal stroke models. A Phase 1 trial demonstrated a favourable safety profile in healthy human volunteers. In a Phase 2a trial in patients with AIS unable to receive thrombectomy or tissue plasminogen activator, BIIB131 (administered within 12 hours) showed angiographic evidence of recanalisation and improved functional outcome versus placebo, with no symptomatic intracranial haemorrhages. DAISY (Delayed AIS thrombolYsis) is a two-part, Phase 2b, randomised, placebo-controlled, registrational trial with Part 1 identifying the optimal BIIB131 dose, and Part 2 evaluating clinical outcomes with the optimal dose.

Methods: Patients aged 18–85 years with symptomatic large vessel occlusion (LVO) or non-LVO anterior circulation occlusion will receive a single intravenous dose of BIIB131 or placebo 4.5–24 hours after last known well (LKW), with visits up to Day 90 (Figure). Primary endpoints are arterial revascularisation/reperfusion (Part 1) and modified Rankin Scale score at Day 90 (Part 2).

Results: DAISY is expected to run from Spring 2023–Spring 2025. Estimated enrolment is ~760 participants (Part 1: ~360; Part 2: ~400) across ~160 sites globally.

Conclusions: Data from DAISY will determine the optimal dose, efficacy and safety of BIIB131 4.5–24 hours after LKW in patients with AIS.

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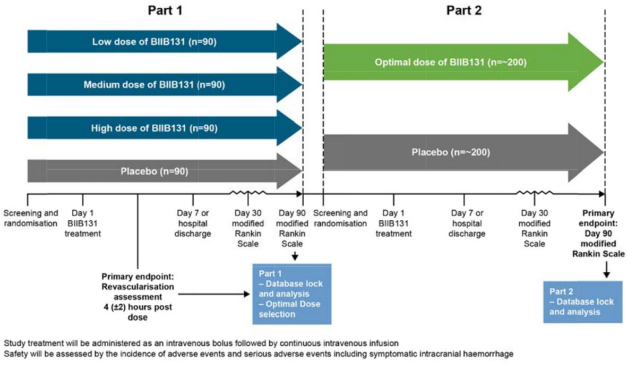
Figure. Schematic of DAISY study design



Disclosure of interest: Yes

ONGOING TRIALS

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OPTIMAL HEAD-OF-BED POSITIONING IN LARGE ARTERY ACUTE ISCHEMIC STROKE

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Background and aims: Flat (0-degree) Head-of-Bed (HOB) positioning may increase blood flow across arterial occlusion in hyperacute large artery ischemic stroke (IS), with some clinical improvement. However, this position may increase the risk of aspiration pneumonia. We evaluate whether 0-degree HOB positioning is associated with neurological stability, without increasing the risk of hospital acquired pneumonia (HAP) in hyperacute large artery IS.
Methods: In this ongoing clinical trial, hyperacute IS patients due to large artery occlusion on CT angiography are randomised to stay in flat HOB or head-elevated (at least 30-degrees) position. Only patients eligible for intravenous thrombolysis and/or mechanical thrombectomy are recruited. Serial NIHSS scoring is performed at 15-minutes interval for 1-hour or until HOB is changed due to medical reasons. Neurological stability is assessed by significant neurological deterioration (NIHSS score increase of 4 or more) during monitoring period. Safety of 0-degree HOB is evaluated by evidence of HAP.
Results: Of the 106 patients recruited so far, 54 were randomized to 0-degree HOB and both groups were well-matched. Median age was 58-years (range 38-76), 68% male with median NIHSS 13-points (range 8-21). Compared to only 2/54 (3.7%) patients in 0-degree HOB, 8/52 (15.4%) patients with elevated HOB developed significant neurological deterioration (p= 0.001). Eleven (10.4%) patients developed HAP without any difference between the HOB positions (p=0.365). Flat-HOB was an independent predictor of neurological stability (HR 5.27, CI 2.8-13.6; p=0.003).
Conclusions: Flat HOB in hyperacute large artery IS is associated with neurological stability, without any significant increase in aspiration pneumonia.
Disclosure of interest: Yes

ONGOING TRIALS

1421

Carotid Artery Stenting during Endovascular treatment of acute ischemic Stroke (CASES) – study protocol for a multicenter randomized clinical trial

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Background and aims: Variation in clinical practice exists regarding the management of tandem lesions in acute stroke patients. The aim of this study is to assess the efficacy and safety of immediate carotid artery stenting (CAS) in patients undergoing endovascular treatment (EVT) for intracranial large vessel occlusions (LVOs) and concomitant carotid artery stenosis.
Methods: CASES is a phase 3 multicenter randomized clinical trial with open-label treatment and blinded outcome assessment (PROBE design) and a non-inferiority design. Patients with a CT-angiography proven intracranial LVO in the anterior circulation and a severe ipsilateral proximal carotid artery stenosis (>50%) or occlusion of presumed atherosclerotic origin will be randomized to either immediate CAS during EVT or to EVT and a deferred strategy with carotid endarterectomy (CEA) or CAS or medical management alone according to the national guidelines. A total of 600 patients will be included in Belgium and the Netherlands. Enrollment is expected to start in April 2023.
Results: The primary endpoint is functional outcome at 90 days, assessed with the modified Rankin Scale (mRS). Secondary outcomes include the mRS overall distribution at 90 days, stroke severity measured with the NIHSS at 24 hours and 5-7 days, infarct volume at 24 hours and recurrence of ischemic events, carotid re-occlusion, symptomatic intracranial haemorrhage, mortality and the quality of life at 90 days.
Conclusions: This study will provide high-quality randomized data on the efficacy and safety of immediate CAS in patients undergoing EVT for acute ischemic stroke due to a tandem lesion.
Disclosure of interest: No

ONGOING TRIALS

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THE DUTCH INTRACEREBRAL HAEMORRHAGE SURGERY TRIAL (DIST); MINIMALLY INVASIVE ENDOSCOPY-GUIDED SURGERY IN PATIENTS WITH SPONTANEOUS, SUPRATENTORIAL INTRACEREBRAL HAEMORRHAGE

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Background and aims: Intracerebral haemorrhage (ICH) accounts for 16-19% of all strokes in Western Europe and contributes profoundly to mortality and disability. Increasing evidence suggests that surgical treatment may be beneficial, in particular with minimally invasive procedures and when performed early. The aim of the Dutch ICH Surgery Trial (DIST) is to assess whether minimally invasive endoscopy-guided surgery within 8 hours of symptom onset in addition to standard medical management improves functional outcome after spontaneous supratentorial ICH when compared to standard medical management alone.
Methods: DIST is a multicentre, prospective, randomised, open clinical trial with blinded outcome assessment. We will include 600 adults (⩾ 18 years) with a spontaneous supratentorial ICH with a haematoma volume ⩾ 10 mL and NIHSS ⩾ 2. Patients with an aneurysm, arteriovenous malformation or fistula, cerebral venous sinus thrombosis, cavernoma or tumour as the cause of their ICH will be excluded. Patients will be randomised (1:1) to minimally invasive endoscopy-guided surgery performed within 8 hours of symptom onset in addition to standard medical management or to standard medical management alone. The primary outcome is the modified Rankin Scale score at 180 days. The treatment effect estimate will be adjusted for known prognostic variables.
Results: DIST has started in November 2022 and will be conducted in 11 neurosurgical centres in the Netherlands. Currently 5/600 participants have been randomized, with a mean age of 68 years (SD 17 years); 20% female (January 2023).
Conclusions: Results are expected in December 2026.
DIST is registered at ClinicalTrials.gov (NCT05460793).
Disclosure of interest: Yes

ONGOING TRIALS

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THE BENEFIT OF EXTENDING ORAL ANTICOAGULANT TREATMENT AFTER ACUTE CEREBRAL VEIN THROMBOSIS (EXCOA-CVT): A CLUSTER OBSERVATIONAL STUDY

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Background and aims: After cerebral vein thrombosis (CVT) there is an increased risk of further venous thromboembolic events (VTEs). Guidelines suggest oral anticoagulation (OAC) for 3 to 12 months after a first episode of CVT, depending on event-related features and thrombophilia. Recommendations are extrapolated from extracerebral VTEs, which may be inaccurate as the risk of thrombotic recurrence is different. EXCOA-CVT is a prospective study with a cluster-randomised allocation design that aims to compare a policy of standard (3-6 months) versus extended (12 months) OAC in the prevention of VTEs after CVT.
Methods: Participating centres are asked whether they have preference for any of the policy treatment options. Centres with no preference are randomly allocated for one of the two options. Adults with confirmed CVT will be treated according to the approach allocated to their centre as soon as their clinical situation is stable and not more than 1 month after CVT diagnosis. Those with conditions judged by the investigator to be absolute indication for prolonged OAC will be excluded.
Follow-up will be performed at 6, 12, 18 (telephone-interview) and 24 months. Primary efficacy outcome is any symptomatic and confirmed VTE (recurrent CVT or other VTE) or death associated with venous thromboembolism. Primary safety endpoints include bleeding events (major/minor; according to site), and death from any cause.
Results: At present, 1177 subjects with CVT have been included from 41 active centres (21 countries).
Conclusions: The results of this study will provide crucial evidence regarding optimal duration of OAC after CVT.
Disclosure of interest: No

ONGOING TRIALS

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Endovascular Therapy for Low NIHSS Ischemic Strokes (ENDOLOW): Clinical Trial Update

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Background and aims: ENDOLOW is designed to determine the safety and efficacy of immediate mechanical thrombectomy (iMT) compared to immediate medical management (iMM) for patients with low National Instiute of Health Stroke Scales (NIHSS 0-5) and large vessel occlusion (LVOs).
Methods: ENDOLOW is a prospective, randomized, open-label, blinded-endpoint (PROBE), multi-center, multinational clinical trial. This investigator-initiated study is funded by Cerenovus, Inc. The study is an adaptive two-stage design allowing for early stopping for efficacy or futility at the interim, or continuation to stage two after reestimating the sample size. Included patients are over 18 years of age, have an NIHSS of 0-5 and presence of an objective neurologic deficit, LVO (intracranial ICA, M1, "M1-like" M2), ASPECTS ⩾ 6, and a baseline mRS ⩽ 2 who present within 8 hours from last known well. The first stage will enroll up to 200 patients. Patients are randomized 1:1 to either iMT or iMM using a permuted block randomization stratified by IV tPA, time from onset to randomization, occlusion site, and age. The primary endpoint is the distribution of 90-day mRS ("shift").
Results: ENDOLOW received formal confirmation of funding in September 2018. The trial is planned to recruit patients from the USA, Canada and Germany. 1st Enrollment was 05-SEP-2020 at Grady Memorial Hospital, Atlanta, USA. Update on trial progression will be presented at the time of the conference.

Conclusions: ENDOLOW is designed to establish the clinical value of iMT in the treatment of patients with LVOs and low NIHSS and is currently enrolling.
Disclosure of interest: Yes

ONGOING TRIALS

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Minimum Detectible Change and Minimum Clinically Important Difference of Montreal Cognitive Assessment in a stroke population

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Background and aims: The Montreal Cognitive Assessment (MoCA) is a commonly used instrument at stroke units and in outpatient care settings to detect cognitive impairment. No previous study have estimated and evaluated clinically meaningful changes in MoCA scores in a large stroke cohort.
The Minimum Detectible Change (MDC) is defined as the smallest change in score that signifies a true change and not a measurement error, between two time points. The minimum clinical important difference (MCID) is the smallest change in MoCA score that can be considered meaningful or important to a stroke survivor.
We aim to establish MDC and MCID of MoCA.
Methods: Data from the EFFECTS trial (Efficacy of Fluoxetine – a randomized controlled Trial in Stroke) will be analyzed. Baseline cognitive screening with MoCA was performed 2 – 15 days after onset of stroke. Follow-up cognitive screening was performed at 6 months.
The MDC will be the upper boundary of a 95% CI for the standard error of measurement in the MOCA scores. The MCID of MoCA will be determined through two methods: a distribution-based approach and an anchor-based approach.
Results: In total 1500 patients were included in EFFECTS MoCA score was available for 1,286 at baseline and for 1,262 at 6 months. The mean MoCA score at baseline was 22.8. MDC and MCID analyses of MoCA are ongoing.
Conclusions: The results will help to determine sample sizes for intervention studies and help evaluate efficacy of cognitive therapies for stroke survivors.
Disclosure of interest: No

ONGOING TRIALS

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Comparison of dual antiplatelet therapy versus warfarin as secondary prevention strategy for AntiPhospholipid Syndrome-related STROKE (APS-STROKE): Rationale and design of a prospective, randomized, open-label, blinded-endpoint trial

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Background and aims: Antiphospholipid syndrome (APS) has close association with ischemic stroke, however, optimal treatment strategy for APS-related stroke has yet to be established. The clinical guidelines suggest using warfarin for APS-related stroke; however, the evidence is not solid. Considering the relatively young age of patients with APS and high clinical burden of using warfarin, it is necessary to verify whether warfarin is essential. Among available regimens, dual antiplatelet therapy (DAPT), which has been increasingly chosen as the initial therapy for acute stroke, has never been evaluated for its efficacy and safety in APS-related stroke. Thus, we aim to compare DAPT and warfarin as a secondary preventive medication for patients with APS-related stroke.
Methods: APS-STROKE is an exploratory, multicenter, prospective, randomized, open, blinded-endpoint clinical trial. Adult patients with definite APS who have history of ischemic stroke will be included. Patients with high-risk APS (triple positivity or persistently high titers of anti-cardiolipin or anti-β2-glycoprotein I antibodies), systemic lupus erythematous, or indications for continued antiplatelet or anticoagulant therapy will be excluded. Eligible patients will be 1:1 randomized to receive DAPT (aspirin plus clopidogrel) or warfarin. The primary outcome is composite of any death, any stroke, systemic thromboembolic events, and major bleeding during the 2-year follow-up period.
Results: The protocol of this study is currently undergoing regulatory approval process. Detailed information on APS-STROKE trial will be submitted to clinicaltrials.gov.
Conclusions: This study would provide valuable information for determining the optimal secondary prevention strategy for APS-related stroke.
Disclosure of interest: Yes

ONGOING TRIALS

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DOES PHARYNGEAL ELECTRICAL STIMULATION IMPROVE SWALLOWING IN ACUTE STROKE DYSPHAGIA? THE PHEAST TRIAL

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Background and aims: Dysphagia (swallowing difficulties) is common post stroke and an independent predictor of poor outcome, but there are no standardised treatment guidelines. Pharyngeal electrical stimulation (PES) is licensed for use in the UK and Europe but lacks a definitive evidence-base and so is not widely used. We aim to assess whether PES is safe and effective at improving post-stroke dysphagia.
Methods: PhEAST is an international prospective, randomised, open-label, blinded-endpoint (PROBE) trial. 800 adults with recent (4-21 days) ischaemic or haemorrhagic anterior or posterior circulation stroke, and clinical dysphagia with a reliance on non-oral nutrition will be recruited. Patients will be randomised (1:1), with stratification on country and minimisation on age, sex, dysphagia severity rating scale (DSRS), impairment, stroke type, circulation and time to randomisation, to receive either PES or No PES. The PES group will receive six, once daily (10 minute) treatments of PES. Both groups will receive standard dysphagia rehabilitation. The primary outcome is dysphagia status, assessed using the Dysphagia Severity Rating Scale (DSRS) at day 14. Secondary outcomes include PES threshold and tolerability at day 7, dysphagia status, dependency, disability, quality of life, cognition, mood and disposition at 90 and all-cause mortality at day 365.
Results: As of 16th January 2023, 35 participants have been recruited to the PhEAST trial.

Conclusions: PhEAST will provide definitive evidence for the use of PES in acute stroke. The results may directly inform clinical decision making and support decisions on guidelines for standardised practice in dysphagia treatment.
Disclosure of interest: No

ONGOING TRIALS

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Rationale and design of the Statistical Analysis techniques Versus Artificial Neural Networks for diagnosis and outcome prediction after Acute Stroke (SAVANNAS) Collaboration Study

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Background and aims: Stroke is common, may be mimicked by other conditions, and often has a poor outcome. We will assess and compare the accuracy of state-of-the-art machine learning models and statistical regression techniques for event diagnosis and predicting post-stroke outcomes.
Methods: High-fidelity data on ~90,000 patients with acute stroke is being sought from chief investigators of published trials (which include patients with a final diagnosis of either stroke, TIA or mimics). Data include trial characteristics, patient demographics, baseline clinical and imaging data, final diagnosis and outcome measures. We will use artificial neural network (ANN) models, including deep neural networks (DNN) and conventional statistical regression models (binary, Cox, ordinal and linear regression). These modelling methods will be compared for the diagnosis of stroke versus mimics, and prediction of early complications (deterioration, stroke recurrence and re-bleeding) and late outcomes (functional outcome, cognition, mood, quality of life, disposition, death) after stroke.
Results: As of 16th January 2023, the SAVANNAS collaboration has received individual participant data for 23 trials; including 59,193 patients records.
Conclusions: If diagnostic and prediction models are accurate then their use could be rapidly introduced into clinical care to improve patient management, for example through the use of apps on phones/tablets/computers.
Disclosure of interest: No

ONGOING TRIALS

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Efficacy of Cerebrolysin Treatment as an add-on Therapy to Mechanical Thrombectomy – preliminary results of WIM-Cerebrolysin Study

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Background and aims: We hypothesized that adding Cerebrolysin (30 ml iv od within 8h of onset and followed until day 21) in consecutive 50 acute ischemic stroke (AIS) patients (with baseline small ischemic core, good collateral status, effective reperfusion, symptoms of cortical damage) may increase the effectiveness and safety of mechanical thrombectomy (MT) in the early recovery phase (90 days) comparing to 50 historical control group (CG) matched for age and sex fulfilling the same inclusion criteria by initiating cytoprotective effects and preventing reperfusion injury and delayed cell death.
Methods: The primary outcome measure is overall proportion of subjects experiencing a favorable functional outcome (mRS 0-2), the secondary objectives are risk of sICH, and morality rates at the 30-day, 90-day and 12 months study period.
Results: The study is currently recruiting patients. 33/50 (66%) patients have already been enrolled and followed for 30 days, 25 (50%) patients finished 3 months of observation. The second interim analysis revealed that those receiving Cerebrolysin comparing to controls had lower risk of post thrombectomy symptomatic (respectively; 5% vs 15%, $p<0.05$) and asymptomatic ICH (12% vs 18%, p=0.09), 30 day (3% vs 18%, $p<0.05$) and 90 day mortality rate (6% vs 18%, $p<0.05$) and tended to have more favorable neurological status in NIHSS at 30 day (mean; 7 ± 2 vs 11 ± 3, p=0.1). Functional independence at 90 day was similar in both groups (40% vs 33%, p=0.12). Update on trial progression will be presented at the time of the conference.
Conclusions: To be determined.
Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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MECHANICAL THROMBECTOMY WITH OR WITHOUT INTRAVENOUS THROMBOLYSIS FOR ANTERIOR CIRCULATION LARGE VESSEL OCCLUSION. ANALYSIS FROM THE IMPERIAL COLLEGE THROMBECTOMY REGISTRY

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Background and aims: Mechanical thrombectomy (MT) is the standard of care for eligible patients with a large vessel occlusion (LVO) acute ischemic stroke. Among patients undergoing MT there has been uncertainty regarding the role of intravenous thrombolysis (IVT) and previous trials have yielded conflicting results regarding clinical outcomes. We aim to investigate clinical, reperfusion outcomes and safety of MT with or without IVT for ischemic stroke due to anterior circulation LVO.
Methods: This observational, prospective, single-centre study included consecutive patients with acute LVO ischemic stroke of the anterior circulation. The primary outcomes were the rate of in-hospital mortality, symptomatic intracranial haemorrhage and functional independence (mRS 0-2 at 90 days).
Results: We enrolled a total of 577 consecutive patients: 161 (27.9%) were treated with MT alone while 416 (72.1%) underwent IVT and MT. Patients with MT who were treated with IVT had lower rates of in-hospital mortality ($p = 0.037$), higher TICI reperfusion grades ($p = 0.007$), similar rates of symptomatic intracranial haemorrhage ($p = 0.317$) and a higher percentage of functional independence mRS (0-2) at 90 days ($p = 0.022$). Bridging IVT with MT compared to MT alone was independently associated with a favorable post-intervention TICI score (>2b) (OR, 1.716; 95% CI, 1.076-2.735, p= 0.023).

Conclusions: Our findings suggest that combined treatment with MT and IVT is safe and results in increased reperfusion rates as compared to MT alone.
Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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Hybrid-Mobile Stroke Unit to increase efficiency in rural areas: treatment options for Stroke Mimics

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Background and aims: Mobile Stroke Units (MSU) have been proven beneficial with more acute stroke patients receiving earlier treatment resulting in better clinical outcome. Evidence available comes from densely populated areas and concerns have been raised about their (cost-)efficient integration into clinical practice in rural regions with fewer stroke patients. The MSU concept may benefit from opening the indication spectrum to include frequent stroke mimics.
Methods: Prospective, observational cohort study to evaluate benefits for treatment and triage with a MSU with extended capabilities (Hybrid-MSU), including radiography, ultrasonography, extended point-of-care laboratory, electroencephalography, and advanced medications. Apart from stroke, suspects with seizures, falls with head trauma, headache, unconsciousness, infection, chest pain, and breathing problems were recruited. Conventional ambulance patients served as control cohort.
Results: 250 patients were assessed and treated by the Hybrid-MSU and compared to 250 control patients. Despite administration of intravenous stroke thrombolysis (n=15) patients received specific anticonvulsants (n=15), antibiotics (n=5), early secondary stroke prophylaxis with aspirin (n=49), and the Sepsis Six bundle (n=2). No patient in the control group received any of these treatments. Hybrid-MSU management allowed to bypass the emergency department in 86% (215 patients) by direct transfer to the required target ward (n=99, 39.6%) or management in the community (n=116, 46.4%).
Conclusions: Integration of a Hybrid-MSU is feasible and has potential benefits for prehospital treatment and triage decision-making. Opening the indication spectrum, together with an act-alone ability, could be a key in the future integration of MSUs into certain systems.
Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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Development and Implementation of a Regional Acute LVO Stroke Protocol for Ideal Destination Decisions (RAPIDD): Phase I results

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Background and aims: The impact of severity-based transport for stroke patients in nonurban communities on systems of care and outcomes is unclear. RAPIDD aims to address this gap by developing an integrated database to monitor stroke care from 911 activation through hospital discharge across 6 non-urban counties in western Michigan, USA.
Methods: We present a descriptive analysis of patients from six non-urban counties who were transported by Emergency Medical Services (EMS) to either one of 6 regional hospitals or to a nearest Comprehensive Stroke Center (CSC) between November 2021 and March 2022. Patients with an EMS impression and/or final hospital diagnosis of stroke were included. Data sources included EMS run sheets, stroke registries and stroke code activation logs.
Results: 152 patients (52.6% Female; median age 73) were identified, including 101 (66.5%) confirmed strokes. EMS transported 52 patients (34.2%) directly to the CSC (CSC-Direct), and 100 patients (65.8%) to regional facilities. Regional transports and CSC-Direct patients were similar in age, sex, NIHSS, and time from symptom onset. Patients taken to regional hospitals had marginally higher thrombolysis rate (11% vs. 3.9%; p=0.13) and slightly shorter times from first medical contact (FMC) to treatment (84 vs. 99 minutes; p=0.19). Thrombectomy rates were similar regardless of destination; however, CSC-Direct patients had significantly shorter times from FMC to skin puncture (277 vs. 155 minutes; p=0.014).
Conclusions: In this non-urban setting, EMS destination decisions were unrelated to stroke severity or timing of presentation. EVT patients had significantly shorter treatment times when taken directly to a CSC.
Disclosure of interest: No

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TRIALS OF MECHANICAL THROMBECTOMY OF BASILAR-ARTERY OCCLUSION COMPARED TO A EUROPEAN OBSERVATIONAL COHORT

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Background and aims: Two recent randomized clinical trials (RCTs) showed mechanical thrombectomy (MT) of basilar-artery occlusions (BAO) to be safe and effective (ATTENTION and BAOCHE). Both trials were conducted in China and differences in the prevalence of intracranial atherosclerosis, access to medical treatment and rehabilitation may differ from Western countries and hamper the generalisability.
Methods: Consecutive patients with BAO undergoing MT were registered from 2017-2021 at a single centre in Copenhagen (CPH) in a Caucasian population (catchment population 2.7 million). Functional outcome was assessed using modified Rankin Scale (mRS) at 90 days, patient characteristics and procedural safety with comparison to the intervention groups of the two RCTs.
Results: Of 108 included patients, 50% achieved mRS 0-3 and the mortality was 32%, which was not different from ATTENTION (46%, p=0.40, 37%, p=0.31, respectively) or BAOCHE (46%, p=0.50, 31%, p=0.93).

Proximal segment BAO was less common (22% vs. 31%, p=0.04, and 65%, p<0.01), the use of intracranial angioplasty or stenting was rarer (9% vs. 40% and 55%, p<0.01), and procedural complications were less frequent (5% vs. 14%, p=0.01, and 11%, p=0.08) in the CPH cohort compared to ATTENTION and BAOCHE, respectively.

Conclusions: One in two patients in the CPH cohort had mRS 0-3, similar to the two RCTs. The observed differences in occluded segment of BAO and the use of stenting supported the expected variations between Caucasian and Asian populations due to the prevalence of intracranial atherosclerosis.

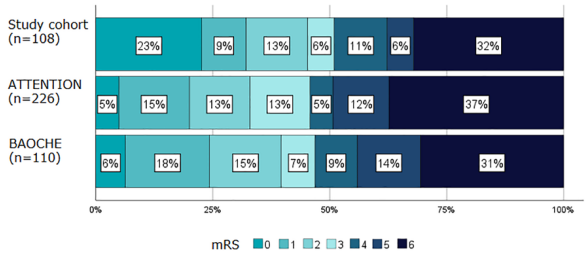

Figure 1. Outcome compared to RCT patients.

Disclosure of interest: No

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Diffusion weighted imaging (DWI) lesion reversal in older stroke patients treated with mechanical thrombectomy

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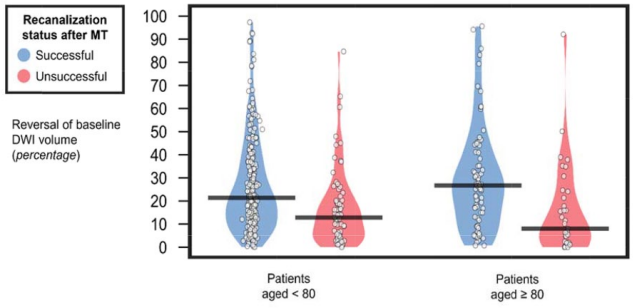
Background and aims: Diffusion-weighted imaging lesion reversal (DWIR) is frequently observed after mechanical thrombectomy (MT) for acute ischemic stroke (AIS), but little is known about age-related differences and impact on outcome. We aimed to compare, in patients <80 *vs.* ⩾80 years old, the effect of successful recanalization on DWIR, and the impact of DWIR on functional outcome.

Methods: We retrospectively analyzed data of patients treated with MT for anterior-circulation AIS with large vessel occlusion in two French hospitals, who underwent baseline and 24-hour follow-up magnetic resonance imaging (MRI), with baseline DWI-lesion volume ⩾10 cc. The percentage of DWIR (DWIR%), was calculated as DWIR volume/baseline DWI-lesion volume. Data on baseline clinical and neuroimaging characteristics were collected.

Results: Among 433 included patients (median age=68 years), median DWIR% after MT was 22% (6-35) in patients ⩾ 80, and 19% (IQR 10-34) in patients <80 (p=0.948). In multivariable analyses, successful recanalization was associated with higher median DWIR% in both ⩾80 (p=0.006) and <80 (p=0.002) patients. In subgroup analyses, collateral vessels status score and white matter hyperintensity volume were not associated with DWIR% (p>0.2). In multivariable analyses DWIR% was associated with increased rates of favorable 3-month outcomes in both ⩾80 (p=0.003) and <80 (p=0.013) patients; the effect of DWIR% on outcome was not influenced by the age group (p-interaction=0.185).

Conclusions: DWIR might be an important and non-age-dependent effect of reperfusion therapies, beneficially affecting 3-month outcomes of both younger and older subjects treated with MT for AIS and large vessel occlusion.



Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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CLINICAL PRESENTATION, RECURRENCE AND OUTCOMES OF STROKE IN CANCER PATIENTS

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Background and aims: To establish the most common presentations, recurrence rates and functional outcomes of ischemic stroke in cancer patients.

Methods: The PubMed/MEDLINE, EBSCO and Elsevier databases were searched for case studies assessing the clinical presentations, thrombolysis rates, stroke recurrence and outcomes in patients with ischemic stroke who had underlying cancer in hospitals.

The keywords "cancer" and "ischemic stroke" were used as MeSH terms, with "malignancy/ies", "ischemic stroke" and "thrombolysis" added as keywords for the search algorithm.

Results: In a meta-analyses including 8 studies, out of 819 patients who were found to have cancer(spanning over 8 studies), 374(45.6%) were found to have presented with focal motor weakness; weakness of the arms or limbs. 24.7% of them were found to present with confusion/altered sensorium. About a fifth of them presented with aphasia. 15.6%(128) presented with headaches when compared to the 668 out of 3661 patients who had stroke without underlying cancer(p=0.0770). 89 of the 819 patients(11.6%) had seizures at the onset of presentation while 25 out of 898 patients who had seizures without cancer-related stroke(p<0.0001).

Conclusions: The presentation may be slightly different, with more of encephalopathy and seizures, as opposed to the typical FAST presentation of strokes without underlying cancer. Thrombolysis should be decided on an individual basis while weighing risk-benefit ratio. The clinical outcomes are found to be more adverse and recurrence rates of stroke in cancer patients are higher than in the general population.

Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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Hyperacute stroke management of the elderly - place for improvement

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Background and aims: Aging is a main risk factor for acute stroke. In older patients, evidence-based guidelines are less often followed resulting in fewer patients receiving acute treatment. Here, we investigate age-related equity in acute stroke management.
Methods: Cohort analysis of hospital-confirmed stroke patients. Primary outcome was time from hospital door-to-recanalising treatments. Secondary outcomes were times from emergency call-to-treatments, times to-imaging and modified Rankin Scale (mRS) clinical outcome at discharge. Patients were classified into groups <80 and ⩾80 years-of-age.
Results: 2091 patients were analysed (<80-years: 60.1%; ⩾80-years 39.9%) comprising 1775 patients with ischaemic stroke (360 large vessel occlusion strokes), 300 patients with haemorrhagic stroke, 16 patients with SDH. Clinical severity on admission was higher in ⩾80-years-group (mean NIHSS: <80: 8±9, ⩾80: 10±10, p<0.001). More patients in the <80-years-group received thrombolysis (<80: 21.6%; ⩾80: 16.5%, p=0.004). No difference was found in the numbers receiving mechanical thrombectomy (<80: 18.1%; ⩾80: 15.9%). More older patients had atrial fibrillation, hypertension or history of angina as risk factors while more younger adults presented with hyperlipidaemia and smoking. Neither primary outcome (door-recanalising treatments: IVT mean: both groups: 39±21 min; MT mean: <80-years: 119±93 min, ⩾80-years: 105±49 min) nor secondary management outcomes showed significant difference. Older patients had worse clinical outcome at discharge (mRS <80: 2±2; ⩾80: 3±2).
Conclusions: In this cohort, in-hospital acute stroke management did not differ in older adults. However, fewer patients received recanalising treatment with thrombolysis. Further research is needed to understand the underlying causes.
Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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Benefits of First-Pass Effect in Basilar Strokes Based on Initial Infarct Size

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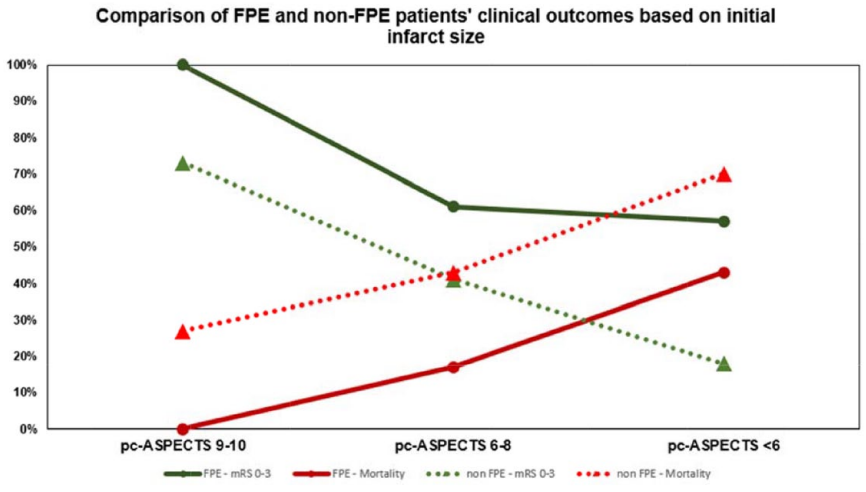
Background and aims: Two randomised controlled trials have shown benefits of thrombectomy for basilar strokes. However, these trials excluded patients with a large infarct on initial brain imaging (defined by a posterior-circulation Alberta Stroke Program Early Computed Tomography Score [pc-ASPECTS]<6) and included only a few patients with a pc-ASPECTS of 6 to 8. It has been shown that achieving a First-Pass Effect (FPE) improved the outcomes of patients with basilar strokes. We therefore aimed to study the benefits of FPE among patients with a large infarct on initial brain imaging (ie a low pc-ASPECTS).
Methods: We retrospectively analysed the prospective multicentric ETIS registry, including 194 patients who had an initial brain MRI and who were treated with thrombectomy. We compared the 90-day clinical outcomes of FPE to non-FPE on patients based on their infarct size: small (pc-ASPECTS=9-10), medium (pc-ASPECTS=6-8) and large (pc-ASPECTS<6).
Results: Patients with a medium-sized infarct (pc-ASPECTS=6-8) and a large infarct (pc-ASPECTS<6) on MRI had significantly better outcomes (ie higher rates of mRS 0-3 at 3 months) if an FPE was achieved (RR=1.61 95%CI [1.16-2.2], p= 0.0047 and RR=3.41 [1.54-7.57] p=0.0025 respectively). An FPE was also associated with a significantly lower mortality among patients with a pc-ASPECTS of 6 to 8 (RR=0.36 [0.17-0.79], p=0.010) (figure).
Conclusions: Achieving an FPE significantly improved clinical outcomes of patients with a low pc-ASPECTS in our study, suggesting that thrombectomy might be beneficial in this population if a complete recanalization can be achieved after one pass.
Disclosure of interest: No



HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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Thrombus perviousness in acute ischemic middle cerebral artery stroke

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Background and aims: Thrombus Perviousness to contrast (TP) is a factor that can be associated with better results with reperfusion treatments in stroke with large vessel occlusion (LVO). The aim of our study is to evaluate the clinical and analytical variables associated with TP and its association with mechanical thrombectomy(MT) in LVO.
Methods: A retrospective study with prospective data collection was performed. Patients with acute MCA LVO (Carotid T and M1 segment) admitted in our center between 01-01-2019 and 30-04-2022 who were treated with mechanical thombectomy were included. TP was calculated by obtaining the average Hounsfield Units(HU) from 3 spheres of 1mm in MCA hyperdensity in baseline CT and in angio-CT and performing the subtraction of both (considering significant perviousness if difference $>$ 10HU).
Results: N=95; 48.4% women. Mean age was 72(SD=13.6). 25(26.3%) carotid T and 70(73.7%) MCA-M1 acute occlusions were treated. TP was $>$10HU in 63(66.3%) cases. Higher leukocyte count (p=0.006), higher platelet count(p=0.042) and higher serum creatinine levels(p=0.043) were significantly associated with an increase in TP. A non-significant trend was identified with hematocrit (p=0.06). High TP was associated with shorter procedure duration (mean 63min; SD=46min; p=0.017). No statistically significant association was found with functional outcome (modified Rankin scale) and mortality.
Conclusions: In our study TP was associated with blood form elements levels and altered renal function. Thrombi with higher TP could lead to lower technical difficulty of extraction in MT.
Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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IMPACT OF ATRIAL FIBRILLATION ON THE OUTCOMES OF PATIENTS UNDERGOING ENDOVASCULAR THROMBECTOMY. ANALYSIS FROM THE IMPERIAL COLLEGE THROMBECTOMY REGISTRY

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Background and aims: To compare safety, clinical outcomes, and baseline characteristics among patients with atrial fibrillation (AF) and without AF who underwent mechanical thrombectomy (MT) for acute ischemic stroke due to anterior circulation large vessel occlusion (LVO).
Methods: This observational, prospective, single-center study included consecutive patients with acute LVO ischemic stroke of the anterior circulation. Demographic, neuro-imaging and clinical data were compared between patients with AF and their counterparts without AF. Study outcomes were functional dependence (mRS $>$2) and mortality at 90 days, rate of immediate complications. Univariate regression analyses were performed to identify predictors of predefined outcomes and multivariate logistic regression analysis was performed to identify independent predictors.
Results: Overall, 573 patients were included (250 AF group vs 323 no AF group). People in AF group were older, higher CHADSVASC score, and more frequently on oral anticoagulant on admission (33 vs 4%, p$<$0.001). Rates of immediate complications and mortality were similar between the two groups while patients without AF had a better rate of functional independence (43 vs 33%, p=.015). The result of the multivariate logistic regression analysis showed that age (odds ratio [OR], 1.03; 95% CI, 1.01–1.05; P=0.0001), ASPECT score ([OR], 0.74; 95% CI, 0.42–1.22; P$<$0.0001) and TICI $\geq$2b ([OR], 0.31; 95% CI, 0.16–0.63; P=0.0001) were independent predictors of functional dependence. AF was not independently associated with a non-favorable post-intervention outcome.
Conclusions: Our analysis did not show that patients with AF experience worse outcomes following mechanical thrombectomy for acute ischemic stroke.
Disclosure of interest: No

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RELEVANCE OF NIHSS SUBITEMS FOR BEST REVASCULARIZATION THERAPY IN MINOR STROKE PATIENTS WITH LARGE VESSEL OCCLUSION: AN OBSERVATIONAL MULTICENTRIC STUDY

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Background and aims: The best management of acute ischemic stroke patients with a minor stroke and large vessel occlusion has not yet been determined. Specific clinical and radiological data may help to select patients who benefit from Endovascular Therapy (EVT). We aimed to evaluate the relevance of NIHSS subitems for predicting potential benefit of EVT after intravenous thrombolysis (IVT) versus IVT alone.
Methods: We extracted data from consecutive patients with M1 or proximal M2 MCA occlusion and admission NIHSS scores of 0-5 treated with IVT+/-EVT between May 2005 and March 2021 from nine prospectively-constructed stroke registries from seven French and two Swiss comprehensive stroke centers.
We performed adjusted interaction analyses between admission NIHSS subitems and revascularization modality for two primary outcomes at 3 months: non-excellent functional outcome (mRS 2-6) and difference in NIHSS between 3 months and admission.
Results: Of the 533 patients included (median age 68.2 years, IQR59.2-79, 46% women, median admission NIHSS 3, IQR2-4), 136 (25.5%) patients initially received bridging therapy and 397 (74.5%) IVT alone. Adjusted interaction analysis revealed that only the admission NIHSS facial palsy subitem less frequently predicted non-excellent outcome in patients treated by IVT alone versus bridging therapy (OR=0.47, 95%CI=0.24-0.91, p=0.013). Regarding NIHSS-difference at 3 months, no single subitems interacted with the type of revascularization therapy.
Conclusions: This retrospective multicenter analysis found that NIHSS subitems at admission had little value in predicting patients who might benefit from bridging therapy as opposed to IVT alone. Radiological variables may be more suitable for identifying EVT responders.
Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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COLLATERAL CIRCULATION AS A PREDICTOR OF SYMPTOMATIC HEMORRHAGIC TRANSFORMATION AFTER SUCCESSFUL RECANALIZATION IN PATIENTS UNDERGOING MECHANICAL THROMBECTOMY

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Background and aims: It has been reported that in patients with poor collateral circulation (CC), successful recanalization after mechanical thrombectomy (MT) may increase the risk of hemorrhagic transformation (HT). However, few data have been published to confirm this association. In this study, we wanted to analyze the effect of of CC on the development of HT and whether this effect was dependent on the recanalization degree.
Methods: We retrospectively analyzed 339 patients with a first anterior hemispheric ischemic stroke consecutively treated with ET. CC was evaluated on angio-TC performed before ET and classified following Tahn et al. classification. HT was classified following ECASS II criteria on cranial CT performed at 24 h and considered symptomatic (sHT) when associated with an increase ⩾4 points in the NIHSS. Successful recanalization was considered when TICI2b,2c or 3 post-ET was achieved.
Results: HT after ET occurred in 124 (36.6%) patients and was symptomatic in 10 (2.9%). HT was more frequent in the group of patients with poor CC and successful recanalization (p=0.002). This group was also more likely to have sHT (p=0.014). In the logistic regression analysis, poor CC associated with successful recanalization is an independent predictor of HT (OR 1.783;95%IC, 1.041-3.054), that is even more powerful for the prediction of sHT (OR 4,787;95%IC, 1.015-22.578).
Conclusions: Our study confirms that poor baseline collaterals is an independent predictor of sHT after endovascular treatment, especially in those patients with successful recanalization. This information could be of value for the selection of patients to be treated.
Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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Early loading dose of dual antiplatelet treatment in acute ischemic stroke associated with tandem lesions

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Background and aims: Antiplatelet treatment in patients with tandem lesions treated with intravenous thrombolysis (IVT) and endovascular thrombectomy (EVT) with acute stenting is challenging as a careful balance between hemorrhagic risks and stent thrombosis is needed. In this study, we aim to investigate the effects of early (within 12 hours) loading dose of Aspirin and Clopidogrel after IVT and EVT including acute stenting.
Methods: A retrospective analysis from a single high-volume center was performed. The main outcome was occurrence of brain parenchymal hematoma. Secondary outcomes included the rate of stent thrombosis, mortality and functional independence, at 90 days.
Results: The study included 71 patients. For primary outcome, we did not find any significant difference in the rate of parenchymal hematoma type 1 and 2 in patients receiving Clopidogrel within 12 hours, between 12-24 hours, and beyond 24 hours from IVT (4.4% versus 8.3% versus 13.8%; p-value NS), confirmed in the ordinal logistic regression (p-value for the model: 0.48; p-value for clopidogrel timing: 0.58; p-value for clopidogrel dosing: 0.27; p-value for each interaction: NS).
Stent occlusion occurred less frequently in patients treated with a loading dose within 12 hours (0% versus 8.5%, p NS). The rate of mortality and independence did not differ.
Conclusions: Administration of a loading dose of Aspirin and Clopidogrel within 12 hours from IVT in patients with tandem lesions treated with EVT and acute stenting is safe in terms of hemorrhagic transformation

and effective in preventing stent thrombosis. A randomized-controlled trial in this high-risk population is needed.
Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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The acute effects of remote ischaemic conditioning on cerebral perfusion in healthy subjects

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Background and aims: Severe reductions in cerebral blood flow (CBF) lead to neuronal cell death in ischaemic stroke. Remote ischaemic conditioning (RIC) is being studied in acute studies of ischaemic stroke however no studies have investigated the acute effects of RIC on CBF in humans.
Methods: Healthy volunteers underwent baseline MRI and then received RIC applied to the right arm using an MRI compatible sphygmomanometer. Five mins inflation (200 mmHg) was followed by 5 mins relaxation, 4 cycles total, before repeat MRI. Cross sectional flow through both carotid arteries provided mean CBF velocities (CBFv, cm3/sec). Arterial spin labelling was mapped with T2 cross sectional images to provide cerebral tissue perfusion (cm3/min) in 7 hemispheric regions of interest (ROI) using nordicICE v4.2.0. Pre and post changes in MRI parameters were compared using Mann-Whitney U tests (significance $p<0.05$).
Results: Eight volunteers, mean (SD) age 45 years (9.9) participated. Mean CBFv in the left ICA reduced significantly (-9.2%) following RIC (26.8 vs 24.2 cm3/sec; p=0.001) compared to right ICA CBFv (29.3 vs 28.7; p=0.399). Changes in overall hemispheric CBF did not reach statistical significance, however mean left hemispheric CBF (cumulative of 7 ROIs) appeared to increase by 6.7% (198.8 cm3/min vs 213.7; p= 0.12) and right hemispheric CBF by 2.2% (210.7 vs 215.2; p=0.499).
Conclusions: RIC appears to result in acute changes to CBFv at the level of the ICA that may lead to meaningful
changes in hemispheric CBF. This may be mediated by vasodilatory changes in the cerebral blood vessels.
Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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Groin to recanalization time: an overlooked independent predictor of outcome in acute ischemic stroke. Is it time for new solutions?

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Background and aims: Endovascular thrombectomy (EVT) is the standard of care for selected patients with acute ischemic stroke (AIS) and large vessel occlusion, associated with intravenous thrombolysis, when indicated. While many studies focused on pre-hospital and in-hospital pathways, only few analyzed the association between groin to recanalization (GTR) time and outcome.
We aimed to explore the impact of GTR time on functional outcome in patients undergoing EVT.
Methods: All patients with anterior circulation stroke treated with EVT at our center in 2020 and 2021 were included. The cohort was divided into two groups, according to GTR time shorter or longer than 30 minutes. Regression analysis assessed the association between GTR time and 3-months outcome, defined as modified Rankin Scale 0-2. ANOVA for repeated measures was performed to assess early neurological improvement, setting NIHSS as dependent variable.
Results: The study included 326 patients. The groups had similar baseline characteristics. Regression analysis showed shorter GTR time is an independent predictor of favorable outcome (OR 2.19 [1.19-4.05]). Onset NIHSS and ASPECT scores were also found to be independently associated with outcome. Repeated measures ANOVA confirmed greater early neurological improvement in the shorter GTR time group.
Conclusions: Our study showed a significant association between GTR time and outcome in patients undergoing EVT, emphasizing procedural time as a key prognostic factor. This may implicate that acute stroke patients should be managed in high-volume centers of expertise. Moreover, the findings of our study may raise the issue of developing alternative or "rescue" strategies for complicated procedures.
Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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Safety of combined intravenous thrombolysis and endovascular therapy for late-window acute ischemic stroke

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Background and aims: The safety and efficacy of bridging intravenous thrombolysis (IVT) for late-presenting acute ischemic stroke with large vessel occlusion (LVO) treated with endovascular therapy (EVT) is unknown.

Methods: We included patients with anterior circulation LVO treated with EVT 6-24 hours after last known well (LKW) from the multicentre, retrospective CT for Late EndovasculAr Reperfusion (CLEAR) study (NCT04096248). We used inverse probability of treatment weighting (IPTW) modelling adjusted for clinical and imaging confounders (age, baseline mRS, NIHSS, ASPECTS, transfer status, imaging modality, occlusion site, time last known well to treatment) to compare functional outcome, symptomatic intracranial haemorrhage (sICH) rates and mortality rates between EVT patients with and without IVT bridging.

Results: We included 2749 patients, of whom 549 received bridging IVT. Median time to EVT was 560 (IQR 432 -791) minutes in the bridging group and 724 (IQR 544 -912) minutes in the direct EVT group. Patients with IVT bridging had less premorbid disability, less atrial fibrillation, higher rates of witnessed stroke onset, higher transfer rates, and shorter LKW-presentation or LKW-EVT time intervals (Table 1). There was no difference with regards to functional outcome, sICH rates or mortality between the treatment groups (Table 2).

Conclusions: In this retrospective analysis bridging IVT in LVO acute ischemic stroke treated with EVT between 6 and 24h after LKW was not associated with differences in functional outcome or safety risks.

Table 1: Patient Characteristics receiving EVT alone vs bridging therapy (IVT + EVT) in the 6-24 hour window

	EVT	IVT + EVT	P-value
	N (mean ; σ)	N (Mean ; σ)	
Age, years	2200 (70 ; 14.3)	549 (70 ; 14.7)	0.52
	N (Median ; IQR)	N (Median ; IQR)	
ASPECTS	2200 (8 ; 7-9)	549 (8 ; 7-9)	0.22
Baseline mRS	2200 (0 ; 0-2)	549 (0 ; 0-1)	**<0.01**
Baseline NIHSS	2200 (16 ; 10-20)	549 (16 ; 12-20)	0.05
LKW-ED, mins	2200 (725 ; 544-911)	549 (560 ; 432-791)	**<0.01**
LKW-groin puncture, mins	2185 (724 ; 544-912)	549 (560 ; 432-791)	**<0.01**
LKW-imaging, mins	1876 (666 ; 482-864)	463 (498 ; 382-701)	**<0.01**
	N (%)	N (%)	
Atrial fibrillation	733 (35.67)	162 (30.80)	**0.04**
Diabetes	552 (25.11)	123 (22.45)	0.19
Hypertension	1607 (73.11)	394 (71.77)	0.53
Men	1011 (45.95)	238 (43.35)	0.27
Occlusion site			0.08
Proximal carotid	167 (7.59)	54 (9.84)	
Distal carotid	391 (17.77)	112 (20.40)	
M1	1241 (56.41)	298 (54.28)	
M2	401 (18.23)	85 (15.48)	
Time to imaging prior to EVT			**<0.01**
CT	773 (35.14)	187 (34.06)	
CTP	1097 (49.86)	185 (33.70)	
MRI	330 (15.00)	177 (32.24)	
Transfer	1212 (55.09)	425 (77.41)	**<0.01**
Witnessed stroke onset	213 (11.45)	117 (25.05)	**<0.01**

Table 1: patient characteristics. Missing data on patient characteristics that were not weighted for IPTW modelling were negligible, except for atrial fibrillation, witnessed stroke onset and LKW to imaging time (168, 421 and 410 patients respectively). Abbreviations: ED= emergency department, LKW= last-known-well, mRS= modified Rankin Scale

Table 2: IPTW evaluation of outcomes after EVT vs IVT+EVT

	N		Event (%)		OR (95% CI)	P-value
	EVT	IVT+EVT	EVT	IVT+EVT		
Ordinal mRS shift	2031	523	NA	NA	1.03 (0.89-1.19)	0.72
Functional independence (mRS 0-2, 90 days)	2031	523	764 (37.6)	215 (41.1)	1.09 (0.87-1.38)	0.44
Successful recanalization (mTICI score: 2b, 2c or 3 vs. 0-2a)	2188	546	1873 (85.6)	458 (83.9)	1.19 (0.81-1.75)	0.39
sICH	2171	542	134 (6.2)	28 (5.2)	0.75 (0.38-1.48)	0.40
Mortality	2038	523	471 (23.1)	126 (24.1)	1.14 (0.89-1.46)	0.31

Table 2: Abbreviations: IPTW, inverse probability of treatment weighting; N, the total number of patients; OR, odds ratio; CI, confidence interval; mRS, modified Rankin Scale; EVT, Endovascular thrombectomy; IVT, Intravenous thrombolysis; TICI, Thrombolysis in Cerebral Infarction; sICH, symptomatic intracranial haemorrhage. Note: The IPTW analysis accounts for the following variables: age, baseline mRS, baseline NIHSS, ASPECTS, transfer status, imaging modality, occlusion, and time last known well prior to treatment.

Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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THE EFFECT OF INADVERTENT HYPOTHERMIA AFTER MECHANICAL THROMBECTOMY IN PATIENTS WITH LARGE VESSEL OCCLUSION STROKE

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Background and aims: Postinterventional hypothermia is a frequent complication in patients with large vessel occlusion strokes (LVOS) after mechanical thrombectomy (MT). This inadvertent hypothermia might potentially have neuroprotective, but also adverse effects on patients' outcomes. We aimed to determine the rate of hypothermia in patients with LVOS receiving MT and its influence on functional outcome.

Methods: We performed a monocentric, retrospective study using a prospectively derived databank including all LVOS patients receiving MT between 2011 and 2021. Predictive value of body temperature on ICU-arrival and body temperature categories (hyperthermia (⩾38°C), normothermia (36°C–37,9°C) and hypothermia (<36°C)) on functional outcome were analyzed using multivariable bayesian logistic regression models. Favorable outcome was defined as modified Rankin Scale (mRS) ⩽3.

Results: Of the 555 included LVOS-patients with MT (47.2% men, mean±SD age 72.7 ± 12.8 years), 5 (0.9%) were hyperthermic, 261 (47%) normothermic and 289 (52.1%) hypothermic. The rate of hypothermia was significantly higher in patients with unfavorable outcome after 90 days compared to in patients with favorable outcome (151 (58.8%) vs. 105 (47%); p=0.016). Lower temperatures on ICU-admission

predicted unfavorable outcome at discharge (mRS>3: OR 0.68, 95%CI, 0.52-0.89, p=0.004 and NIHSS: OR 0.92, 0.87-0.98, p=0.005) and after 90 days (mRS>3: OR 0.80, 0.64-1.01, p=0.063). Similar results were found for the categorical analysis.
Conclusions: More than half of the LVOS-patients with MT in this cohort were hypothermic on ICU admission. Hypothermia was an independent predictor of unfavorable functional outcome. Our findings warrant a prospective trial investigating active warming during MT.
Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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DEVELOPMENT OF A STANDARDISED NEUROLOGICAL OBSERVATION SCHEDULE (SNOBSS) TO DETECT EARLY NEUROLOGICAL DETERIORATION (END) AFTER ACUTE STROKE

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Background and aims: Early neurological deterioration (END) is poorly defined but is a common clinically significant complication that affects outcome after stroke. We aimed to develop a Standardised Neurological OBservation Schedule for Stroke (SNOBSS) that can feasibly identify change in a patient's neurological status.
Methods: Findings from a series of reviews around the content and properties of stroke scales, a UK wide survey of monitoring practice (n=125) and interviews with clinical practitioners (n=23) regarding neurological assessment and monitoring practice were presented to and discussed by an expert group and informed the design of SNOBSS. The usefulness of items previously used to assess neurological status were considered. Through highlighting and discussing disagreements, gaining consensus on the items to be included and the way to assess them, and then considering how to apply them, the SNOBSS and associated decision flowchart was established.
Results: The resultant SNOBSS is a simple grading system including 5 items (Level of Consciousness, Communication, Gaze, Facial Paresis, Motor Power), assessment criteria, and accompanying advice to encourage standardised application. Rather than assigning points to symptoms, a response is triggered when changes in items are likely to indicate a meaningful deterioration. Flexibility on assessment timing and escalation is allowed within the decision flowchart based on specialist local assessment and what could potentially be done if END noted.
Conclusions: Key components of neurological monitoring to inform clinical pathways and further research were agreed. The development of the SNOBSS represents a move towards more consistent and stroke specific monitoring to identify END.
Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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PRE-HOSPITAL STROKE VIDEO TRIAGE IN NORTH CAMBRIDGESHIRE, UNITED KINGDOM

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Background and aims: During the COVID-19 pandemic, the PHOTONIC (Prehospital triage for suspected stroke patients) Study took place in London and East Kent. Building on the learning and experience from this Study, and following a successful bid to NHS England for funding, Pre-Hospital Stroke Video Triage (PVT) has been implemented in North Cambridgeshire.
The aim of this project is to: Develop strong "one-team" co-operative network within pre-hospital and hospital emergency care services.
Improve door-to-imaging, door-to-needle and door-to-Hyper-Acute Stroke Unit times.
Enhance the assessment for patients presenting with neurological symptoms, and improve patients getting to the right treatment destination first time.
Create a TIA pathway for patients following video assessment.
Methods: We developed and implemented a pathway for pre-hospital stroke video triage August 2022.
Results: Following a brief video assessment using FaceTime, the crew will then be directed to convey to Acute Stroke Centre, Emergency Departments or to follow TIA Pathway.
32 patients were triaged; 10 diverted from ASC/HASU, 20 directed straight to CT scanner and 2 patients followed TIA pathway. Early results show a significant reduction in door-to-imaging times (22 minutes down to 2 minutes) and door-to-needle times (55 minutes down to 15 minutes). There was very positive feedback from patients, ambulance crews and emergency stroke team. A full evaluation will take place in May 2023.
Conclusions: Pre-hospital video stroke video triage pathway is an efficient tool significantly improving quality of pre-hospital and hospital emergency stroke care. There is potential for further development.
Disclosure of interest: No

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STROKE MANAGEMENT IN GEORGIA- RED FLAGS

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Background and aims: Low-income and middle-income countries suffer a higher burden of strokes than high-income countries. The implementation of stroke care in developing countries faces many challenges despite global stroke policies and guidelines. We have evaluated stroke care in 13 major hospitals across Georgia and its limitations.
Methods: We have developed a questionnaire, containing 15 open-ended questions and let the Neurologist answer them, Questions regarding acute stroke care, thrombolysis, thrombectomy, use of DAPT in minor stroke/TIA, evaluating risk factors, use of "Nootropic agents", screening for dysphagia, availability of stroke nurse, using NIHSS scale, etc. Regional hospitals were included.
Results: We have investigated red flags in Georgian acute stroke care, those were lack of thrombectomy cases, lack of thrombolysis cases, underusing DAPT in acute stroke, and overusing non-protocol-based medications, regions more severely affected.

Conclusions: Strategies should be developed, such as training health professionals to implement protocol-driven care, focusing on regional efforts in particular.
Disclosure of interest: No

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DESCRIPTIVE ANALYSIS OF FUTILE INTER-HOSPITAL TRANSFERS FOR MECHANICAL THROMBECTOMY IN A TELESTROKE NETWORK

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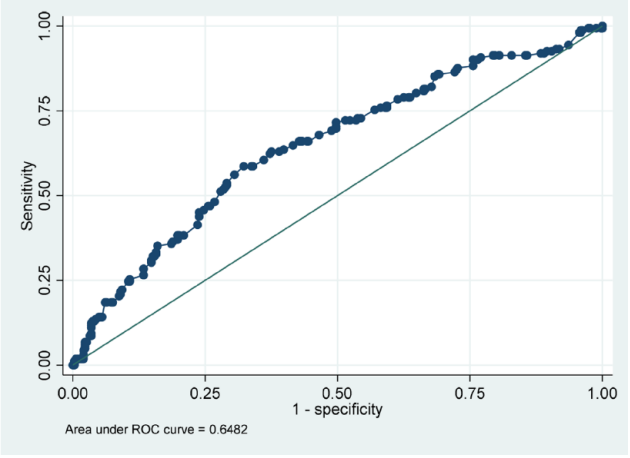
Background and aims: Within an extensive telestroke network, many inter-hospital transfers are performed. In some cases, these are futile (FT) since no clinical benefit is achieved for the patient. Our aim is to analyze the factors to predict and prevent these futile transfers.
Methods: A prospective study of patients transferred for thrombectomy (MT) in a stroke network was performed.
The network includes 30 centers for intravenous fibrinolysis with referral capacity to 6 thrombectomy nodes. Patients with ischemic stroke and large vessel occlusion were selected. Two groups were made according to whether MT was finally performed. The data were analyzed looking for the factors that determined the FT.
Results: 3,462 activations were received and 2,404 (69%) were ischemic stroke. 618 patients were eligible for MT, but in 194 (31.4%) the transfers were FT. The main reasons for FT were distal migration of the thrombus (6%), recanalization (24%) and improvement of NIHSS (22%). There were no differences in baseline characteristics. A low NIHSS score (10 vs 12, p=0.006) and the use of fibrinolysis treatment (50% vs 37%, p=0.003) were associated with FT. A predictive model was created with an AUC of 0.64817 and a specificity of 93.9
Conclusions: In summary, this study provides valuable information on the frequency and impact of interhospital FT for MT in a telestroke network. The incorporation of predictive models such as the one proposed, or even increasing their accuracy with neuroimaging data, could be useful measures to improve the efficiency and quality of care in stroke networks.
Disclosure of interest: No



HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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Influence of susceptibility vessel sign on intravenous alteplase in stroke patients treated with thrombectomy; A post-hoc analysis of the SWIFT-DIRECT trial

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Background and aims: The susceptibility vessel sign (SVS) on baseline MRI in stroke patients was associated with better radiological and clinical outcome after thrombectomy (MT) and poorer outcome after intravenous alteplase (IVT). This study aimed to investigate whether SVS modifies the treatment effect of adding IVT to MT versus MT in patients with large-vessel occlusion.
Methods: This study is a post-hoc analysis of the multicenter randomized trial SWIFT-DIRECT, which aimed to compare whether MT was not non-inferior to IVT+MT between November 2017 and May 2021. Participants with core-lab adjudicated SVS status available and completed MT procedure were included. The treatment effect was assessed on post-interventional successful reperfusion (expanded treatment in cerebral ischemia [eTICI] of 2b-3), pre-interventional reperfusion (defined as eTICI 2a-3) and modified Rankin scale (mRS) at 90 days using adjusted multivariable logistic regression.

Results: From the initial 408 trial participants, 199 were included in this secondary analysis (104 received IVT+MT [52%]). SVS was present in 91% of the included participants (n=182) undergoing MRI. There was no treatment effect heterogeneity regarding the clinical effect of IVT+MT versus MT with strata of SVS.
In the SVS+ group, IVT favoured pre-interventional reperfusion, while it did not in patients without SVS (p for interaction 0.029).
Conclusions: The presence of SVS does not seem to modify the clinical effect of allocation to IVT+MT versus MT. While, IVT may particularly favour pre-interventional reperfusion in patients with SVS, we cannot recommend using SVS for informing decisions in favor or against IVT before MT.
Disclosure of interest: No

THROMBOLYSIS – EXCLUDING CLINICAL TRIAL RESULTS

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LT3001, A NEW SYNTHETIC MOLECULE FOR STROKE TREATMENT, INCREASES FIBRINOLYSIS BY BRIDGING PLASMIN(OGEN) ONTO FIBRIN CLOT

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Background and aims: LT3001, a new molecular entity developed for stroke treatment, is composed of a synthetic peptide and a free radical scavenger. Its activity on restoring occluded blood flow has been demonstrated on several animal models without increasing risk of hemorrhage. For investigating its potent thrombolysis mechanism, the interaction between LT3001 and fibrinogen/plasminogen were assessed using the surface plasmon resonance. An *in vitro* fibrinolysis assay was setup to deduce the lytic mechanism.
Methods: The fibrin clot, which was composed of purified human fibrinogen and washed RBCs, formed on stainless-steel coil spring by induced with thrombin and Ca^{2+}, was incubated in a channel and then flowed with LT3001 (or its metabolites) solution in the present or absence of plasminogen for an hour. After flushing with saline to remove unbound substance, the clot was flowed with tPA solution for another hour. The weight loss of the fibrin clot was measured by an analytical balance.
Results: The weight reduction of fibrin clot was increased dose-dependently when clot was treated with LT3001. Reduce of clot weight was higher in groups treating LT3001 in present of plasminogen than groups in absence of plasminogen. Detail molecular mechanism was further elucidated using different metabolites.
Conclusions: LT3001 induced fibrinolysis by enhancing the bridging of plasmin(ogen) onto fibrin clot, instead of directly enhancing tPA activity. The results further support the phenomenon of less bleeding risk observed in the animal models and clinical trials.
Disclosure of interest: No

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THE FEASIBILITY OF APIXABAN AND RIVAROXABAN MEASUREMENTS IN THE EMERGENCY DEPARTMENT FOR SUSPECTED STROKE

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Background and aims: Use of DOACs within 48h represents a contraindication for intravenous thrombolysis (IVT) in acute ischaemic stroke. ESO guidelines suggest IVT if anti-Xa (AFXa) activity is $<$ 0.5 x 10E3 IU/L in otherwise eligible patients. Heparin (LMWH/UFH) AFXa methods might correspond to drug concentrations above the suggested 30-50 µg/L using quantitative apixaban/rivaroxaban calibrated AFXa methods. We aimed to investigate the feasibility of the implementation of IVT in patients with low drug concentrations and see if AFXa activity can replace drug-calibrated apixaban/rivaroxaban AFXa methods.
Methods: From September 2021 to September 2022, physicians attending suspected stroke patients were able to order apixaban/rivaroxaban and Heparin (LMWH/UFH) AFXa for patients using either drug. Patients with symptoms of $<$ 4.5 hours duration and drug concentration $<$ 25 µg/L where considered for IVT
Results: Of 148 patients, mean age 81, 84% used apixaban. Twelve patients had drug concentration AFXa $<$ 25 µg/L, of these four received IVT. Twenty patients had AFXa activity $<$ 0.5 x 10E3 IU/L. Using linear regression analysis of the samples with apixaban concentration $\leqslant$ 100 µg/L the cut-off for LMWH/UFH AFXa corresponding to 25 µg/L and 50 µg/L were found to be 0.13 and 0.27 10E3 IU/L, respectively.
Conclusions: The implementation of apixaban and rivaroxaban measurement was feasible, with adequate response time, and led to four more IVT treated strokes. AFXa activity can replace the drug-specific apixaban/rivaroxaban AFXa methods, but the safety of IVT at the proposed anti-Xa activity cut-off $<$ 0.5 x 10E3 IU/L needs to be further investigated.
Disclosure of interest: No

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ONE-YEAR CLINICAL OUTCOMES AFTER INTRAVENOUS RECOMBINANT TISSUE PLASMINOGEN ACTIVATOR IN CHINESE PATIENTS WITH ACUTE ISCHAEMIC STROKE: A REAL-WORLD MULTICENTER RETROSPECTIVE COHORT STUDY

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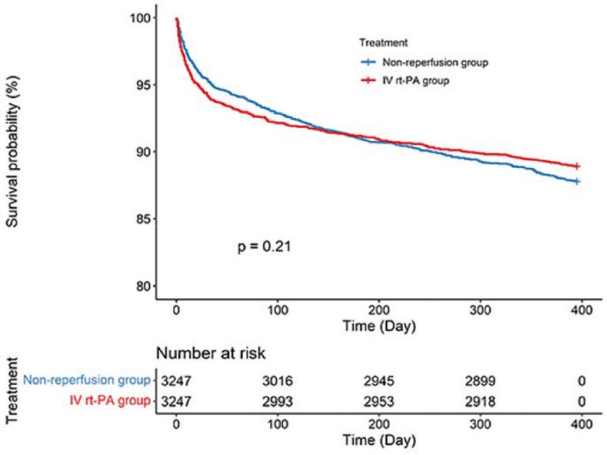
Background and aims: Evidence of the one-year clinical outcomes for IV recombinant tissue plasminogen activator (rt-PA) treatment in Chinese patients with acute ischaemic stroke (AIS) is limited. This retrospective cohort study evaluated the one-year mortality and functional outcomes associated with IV rt-PA among Chinese AIS patients in real-world setting (Clinicaltrials.gov identifier: NCT05395338).
Methods: We analysed the data of AIS adult patients who arrived at hospital within 4.5 hours of symptom onset and were registered in the Zhejiang Stroke Quality Control Centre registry between January 2017 and March 2020. IV rt-PA-treated patients were propensity score-matched (1:1) by baseline characteristics with non-reperfusion patients. Primary outcome was one-year all-cause mortality analysed using Kaplan–Meier curves and Cox regression. Secondary outcomes included one-year functional outcomes analysed using conditional logistic regression.

Results: Of 12551 eligible patients, 3247 IV rt-PA-treated patients were matched against 3247 non-reperfusion patients. One-year all-cause mortality was similar between IV rt-PA versus non-reperfusion (11.1% versus 12.2%; HR, 0.90, 95% CI, 0.78–1.05, *P*=0.183) (Figure). A greater proportion of patients treated with IV rt-PA versus non-reperfusion cohort were reported with favourable outcomes (mRS 0–1: 59.5% versus 54.6%; OR, 1.23, 95% CI, 1.11–1.36) or functional independence (mRS 0–2: 70.9% versus 66.4%; OR, 1.25, 95% CI, 1.12–1.39), and a smaller proportion reported poor outcomes (mRS 5–6: 15.9% versus 20.3%; OR, 0.73, 95% CI, 0.64–0.83)(all *P*<0.001).
Conclusions: In routine practice, IV rt-PA treatment in Chinese AIS patients eligible for thrombolysis was associated with improved one-year functional outcomes despite similar mortality.



Disclosure of interest: No

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IV-THROMBOLYSIS IMPROVES PERFUSION PROFILES IN PATIENTS WITH ANTERIOR CIRCULATION OCCLUSION REGARDLESS OF RECANALIZATION

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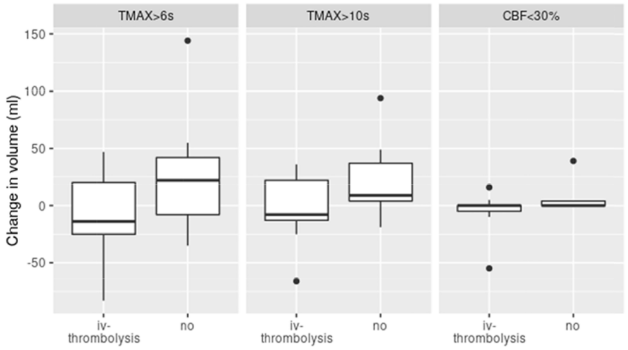
Background and aims: Recent publications suggest a positive added effect of iv-thrombolysis (IVT) in patients that undergo endovascular treatment (EVT). Thrombolytics might have a beneficial impact on microcirculation beyond recanalization. We aim to analyze the potential impact of IVT in patients who underwent a repeated CTP after interhospital transfer.
Methods: We retrospectively screened 129 patients transferred to our hospital from a primary stroke center from June 2021 to December 2022. We collected clinical and radiological data of patients that underwent CTP at both centers, which were analyzed with Rapid software. A neurointerventionalist assessed the occlusion location in CTA.
Results: Twenty-nine patients with anterior circulation occlusion underwent two multimodal studies, median time between CTPs was 167[142-189]min. Sixteen (55.2%) patients received IVT in the primary stroke center, 14(48.3%) received EVT. Reperfusion occurred in 3(10.3%) cases, migration to distal segments in 5(17.2%). Among the 21 patients without changes in the occlusion location, CTP volumes remained stable (Tmax>6s 60[41-141]ml vs 69[41-177], p=0.24; Tmax>10s 19[8-91] vs 21[0-87], p=0.19; CBF30 2[0-52] vs 0[0-42], p=0.92). Volumes tended to decrease with IVT, but a modest increase occurred in patients that did not receive IVT (Tmax>6s -14[-25,+20]ml vs +22[-8,+42], p=0.11; Tmax>10s -8[-13,+22] vs +9[+4,+37], p=0.14; CBF<30% 0[-5,0] vs 0[0,+4], p=0.32) (figure).
Conclusions: In acute stroke patients with a LVO, no substantial changes are expected in CTP volumes in the abscence of recanalization. However, patients that receive IVT tend to present reduced hypoperfusion volumes as compared with patients that do not receive IVT.
Disclosure of interest: No



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The Pivotal Role of Timing of Intravenous Thrombolysis Bridging Treatment prior to Endovascular Thrombectomy

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Background and aims: The role of intravenous-thrombolysis (IVT) as bridging treatment prior to endovascular thrombectomy (EVT) is under debate and better patient selection is needed. As the efficacy and safety of IVT diminish with time, we aimed to examine the impact of bridging treatment within different time frames from symptom onset.
Methods: Data was extracted from ongoing prospective EVT registries in two large tertiary centers. The current study included IVT eligible patients with onset-to-door (OTD)<4 hours. We examined the efficacy and safely of bridging treatment through comparison of the IVT+EVT group with the Direct-EVT group by different time frames.
Results: 408 patients (age 71.1±14.6, 50.6% males) were included, among them 195 received IVT+EVT and 213 underwent direct-EVT. Both groups had similar characteristics. In the IVT+EVT group only,

longer OTD was associated with lower rates of favorable outcome (p=0.021) and higher rates of HT (p=0.001). In patients with OTD⩽2 hours, IVT+EVT compared to Direct-EVT had higher rates of TICI 2b-3 (86.2% versus 80.7%,p=0.038). In patients with OTD>2 hours, IVT+EVT had lower rates of favorable outcome (33.3% versus 56.9%,p=0.021), worse discharge-NIHSS (7[2-13] versus 3[1-8],p=0.024) and higher rates of HT (34.0% versus 8.5%,p<0.001).

Conclusions: In this study we found OTD times to have significant effect on the impact of IVT-bridging treatment. Our study shows that among patients with OTD<2 hours bridging treatment may be associated with higher rates of successful recanalization. In contrast, in patients with OTD>2 hours, bridging treatment was associated with worse outcome. Further time-sensitive randomized trials are needed.

Disclosure of interest: No

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A COST-UTILITY ANALYSIS OF TENECTEPLASE IN THE TREATMENT OF ACUTE ISCHAEMIC STROKE IN THE UNITED KINGDOM

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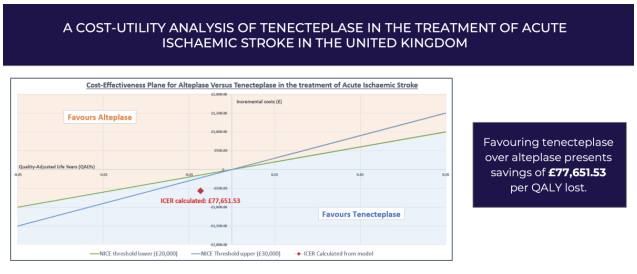
Background and aims: The burden of stroke is a growing concern, with annual costs projected to rise significantly worldwide. Alteplase is a treatment for acute ischemic strokes (AIS), but tenecteplase has been shown to have similar efficacy at a lower cost in recent literature. This is the first study aiming to determine whether tenecteplase is a cost-effective alternative to alteplase in the treatment of AIS by performing a cost-utility analysis, from the perspective of the UK National Health Service.

Methods: Quality-adjusted life years (QALYs) were derived from the ATTEST trial and costs were sourced from 2021/22 NHS reference costs. A decision tree was constructed to evaluate the results based on outcomes using modified Rankin Score (mRS) over a period of 90 days. Multiple one-way sensitivity analyses were performed considering varying costs, complications, and utilities.

Results: The analysis produced an incremental cost-effective ratio (ICER) of £77,651.53 per QALY. Although tenecteplase provided a slightly lower effectiveness compared to alteplase, it was also cheaper. Therefore, the ICER can be interpreted as a saving of £77,651.53 per QALY lost using tenecteplase over alteplase which is substantially higher than the National Institute for Health and Clinical Excellence (NICE) willingness-to-pay threshold of £30,000 per QALY. Sensitivity analyses proved ICER robustness.

Conclusions: It is therefore cost-effective to favour tenecteplase over alteplase despite its marginally lower clinical effectiveness in the treatment for AIS. This study may have implications for clinical practice in the UK and lower income countries to reduce the costs associated with thrombolytic treatment.

Disclosure of interest: No



- Results based on ATTEST (n=104), a randomised control trial comparing clinical outcomes of tenecteplase 0·25 mg/kg versus alteplase 0·9 mg/kg for thrombolysis in confirmed acute ischaemic stroke
- A cost-effectiveness plane shows the ICER value, with the upper and lower willingness-to-pay (WTP) thresholds used based on the NICE thresholds £20,000 (green) and £30,000 (blue). Values below the WTP threshold line favour tenecteplase and those above favour alteplase.

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INTRAVENOUS THROMBOLYSIS IN ACUTE ISCHAEMIC STROKE TWO YEARS INTO THE COVID-19 PANDEMIC: A RETROSPECTIVE STUDY

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Background and aims: Worldwide, changes of intravenous thrombolysis (IVT) treatment in acute ischaemic stroke during the COVID-19 pandemic have been reported. We examined the differences in the provision of IVT in acute ischaemic stroke, two years into the COVID 19 pandemic.

Methods: Data was compared between March 1, 2018 to Feb 28, 2020 (Pre-COVID-19 period) and March 1, 2020 to Feb 28, 2022 (COVID-19 period). Data collected include patients' demographics, IVT rates, and patient outcomes.

Results: There was a small increase of acute ischaemic stroke patient admissions during the COVID-19 period (Pre-COVID-19 n=1041, vs COVID-19 n=1087,). Yet, fewer stroke patients received IVT (19.2% vs 13.9%, p<0.001), and more stroke mimics thrombolysed (8.3% vs 15.6%, p=0.021) during this period. In the cohort of thrombolysed patients, during the COVID-19 period, there was a significant delay of hospital presentation (Pre-COVID-19 = 86 minutes vs COVID-19 = 107 minutes, p = 0.004); and delay of giving IVT (door to needle time: Pre-COVID-19 = 59 minutes vs COVID-19 = 65 minutes, p = 0.002). Further, fewer patients had severe stroke symptoms (NIHSS = >15) (12.2% vs 4.8%, p=0.009) during the COVID-19 period. There was no significant difference in patients' post thrombolysis outcome (post thrombolysis median National Institute of Health Stroke Scale (NIHSS) = 1, p=0.136; discharge modified Rankin Scale (mRS) = 1, p=0.647; and mortality p=0.655).

Conclusions: Although more acute stroke patients presented since COVID-19 started, there was a significant decline in the thrombolysis rates and significant delay in the administration of the IVT treatment.

Disclosure of interest: No

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TENECTEPLASE VERSUS ALTEPLASE IN A THROMBOEMBOLIC STROKE MODEL: DOES IT MATCH WITH CLINICAL TRIALS RESULTS?

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Background and aims: Recombinant human tissue plasminogen activator (rtPA) is the gold standard thrombolytic agent for treatment of acute ischemic stroke. Tenecteplase (TNK) is an optimized mutant of rtPA under clinical evaluation to replace rtPA. Published clinical trials reported no inferiority of TNK versus rtPA, with a simpler administration method, although the dose of TNK to be use is still debated. Our aim was to compare rtPA and TNK in a preclinical stroke model.

Methods: We performed a randomized, blind study to compare rtPA with TNK at the doses being currently tested in stroke patients (equivalent to 0.25 and 0.4 mg/kg). Treatments were administered 20 minutes or 4 hours after inducing the thromboembolic occlusion of the middle cerebral artery in mice by in situ thrombin injection. Lesion volumes, angiographic scores, hemorrhagic transformations were evaluated using MRI and long-term recovery were evaluated using the corridor sensorimotor task.

Results: rtPA and the low dose of TNK reduced ischemic volumes and ameliorated functional deficits when administered early after stroke onset. TNK-treated mice showed less hemorrhagic transformations than rtPA-treated mice.

Conclusions: Altogether, this study is the first preclinical comparative evaluation of rtPA and TNK in a model of stroke. Our data are highly relevant with the current literature reporting clinical trials, suggesting that further preclinical studies using similar approaches could be relevant to optimize the design of clinical trial and to evaluate the potential risks for thrombolytics.

Disclosure of interest: No

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FACTORS ASSOCIATED WITH INTRACEREBRAL HEMORRHAGE AFTER INTRAVENOUS THROMBOLYSIS IN ACUTE ISCHEMIC STROKE: AN ANALYSIS OF THE ACT DATA

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Background and aims: Intravenous thrombolysis (IVT) in acute ischemic stroke (AIS) complicated by intracranial haemorrhage (ICH), is associated with worse outcomes. We aimed to identify factors that were associated with ICH in patients treated with IVT.

Methods: Data from AcT (Alteplase compared to Tenecteplase) randomised, open-labelled, non-inferiority trial were analysed. Univariate analysis of baseline variables was conducted in groups with any ICH, symptomatic ICH (sICH), and parenchymal ICH (PH-1, PH-2 from Heidelberg criteria). Multivariable logistic regression was used to identify factors associated with any ICH, sICH and parenchymal ICH. A subgroup analysis was attempted for participants with visible occlusion in the anterior circulation.

Results: Any ICH was seen in 312 (19.8%), parenchymal ICH in 101 (6.4%), and sICH in 51 (3.2%) of the 1577 study participants. Any ICH was independently associated with baseline stroke severity (OR 1.03, 1.01 – 1.06), occlusion site (Terminal ICA: OR 3.52, 2.05 – 6.04; M1MCA: OR 2.93, 1.84 – 4.86; M2MCA: OR 3.81, 2.66 – 5.77), and baseline intracranial atherosclerotic disease (ICAD) (OR 0.55, 0.38 – 0.77) on CT angiography (CTA) (Table 1). Parenchymal ICH was independently associated with baseline stroke severity (OR 1.08, 1.03 – 2.26) and ICAD (OR 0.55, 0.38 – 0.77). Symptomatic ICH was independently associated with baseline stroke severity (OR 1.06, 1.02 – 1.10) and ICAD (OR 0.24, 0.07 – 0.61). In participants with visible occlusion in the anterior circulation, baseline ASPECTS and ICAD were independently associated with any ICH (Table 2).

Conclusions: Stroke severity, occlusion site and ICAD on CTA, all at baseline were associated with ICH post IVT.

Table 1 – Multivariate logistic regression analysis for any ICH vs no ICH

Factor	Adjusted OR	95% CI	p-value
Baseline NIHSS	1.03	1.01 – 1.06	0.002
CTA occlusion site			
Intracranial ICA	3.52	2.05 – 6.04	<0.001
M1 MCA	2.93	1.84 – 4.68	<0.001
M2 MCA	3.81	2.55 – 5.77	<0.001
Other distal	2.41	1.55 – 3.76	<0.001
Vertebrobasilar	2.36	1.12 – 4.70	0.018
Cervical ICA	0.83	0.13 – 2.97	0.802
ICAD on baseline CT	0.55	0.38 – 0.77	<0.001

Table 2 – Multivariate logistic regression analysis for any ICH vs no ICH with visible occlusion in the anterior circulation

Variable	Adjusted OR	95% CI	p-value
Baseline NIHSS	1.02	1.00 – 1.05	0.097
Intermediate collaterals	0.82	0.48 – 1.42	0.470
Good collaterals	0.61	0.34 – 1.10	0.096
Carotid tandem occlusion	0.67	0.43 – 1.00	0.057
ASPECTS	0.85	0.76 – 0.95	0.004
ICAD on baseline CT	0.63	0.40 – 0.96	0.036

Disclosure of interest: No

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SAFETY AND FEASIBILITY OF A "FAST-TRACK" MONITORING PROTOCOL FOR PATIENTS TREATED WITH INTRAVENOUS THROMBOLYTIC THERAPY

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Background and aims: The COVID-19 pandemic has called for solutions to future events threatening limited ICU resources. A subgroup of post-thrombolytic patients may not require prolonged intensive monitoring, alleviating some burden. Here we describe the safety, feasibility, and utility of a Fast-Track Protocol (FTP) for early de-escalation of high-acuity monitoring.

Methods: We compared a prospective cohort of FTP patients at our stroke centers from April 2020 – February 2022 to a similar retrospective cohort. Those on presentation with NIHSS $<$ 10 and without large vessel occlusion or flow-limiting stenosis, intravenous anti-hypertensive use, and any hemodynamic or respiratory concerns were eligible for FTP. Primary outcomes included early neurologic deterioration (END), defined as worsening of NIHSS $\geqslant$ 4-points at 24 hours, parenchymal hemorrhage, and symptomatic intracranial hemorrhage (sICH).

Results: Of 574 thrombolysis patients, 119 (21%) were eligible for FTP. One hundred (88%) were included for analysis. Mean presentation NIHSS was significantly lower than the retrospective population (4.4 $\pm$ 2.4 vs. 5.4 $\pm$ 2.0, $p<0.000$). Only 54% presented with stroke, and mean hospitalization was 2.9 $\pm$ 0.3 days. None of the four patients with END were due to ICH. No sICHs occurred, and no FTP patients were transferred back to the ICU. Median $\pm$ IQR 90-day mRS was 1 $\pm$ 1.

Conclusions: FTP is safe and feasible to triage neuro ICU patients and decrease unnecessary ICU monitoring. This is important in a post-pandemic era as ICU resources continue to fluctuate. Continued monitoring of FTP will validate the results of this study.

Disclosure of interest: No

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The Impact of Pharmacist Presence on Door-to-Needle Time in Patients With Acute Ischemic Stroke

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Background and aims: The bedside presence of pharmacists in acute stroke management can help in assessment, dose verification, drug formulation, and patient education. Some centers do not have pharmacists to staff the ED and assist with clinical decisions. The aim of this study is to determine the impact of a pharmacist in the coordination and administration of thrombolytics on door-to-needle (DTN) and outcomes.

Methods: This is a retrospective cohort study of patients who received IV thrombolytics, either tPA or TNK, in the ED January 1, 2021 through December 30, 2022. Patients were stratified into treatment teams with (P+) and without (P-) a pharmacist. The primary outcome was door-to-needle (DTN) time. Secondary outcomes included any treatment protocol deviation, length of hospital stay, symptomatic and asymptomatic hemorrhagic transformation, and changes in neurological status as measured by the National Institutes of Health Stroke Scale (NIHSS).

Results: 336 patients met the inclusion criteria, 79 patients were included in the P+ arm and 257 patients were in the P- arm. Pharmacist presence was associated with significant improvement in DTN time (median 42 [IQR: 29-60] vs. 63 [IQR: 45-84] minutes; $P<0.001$). There was no significant difference in the rate of protocol deviation, length of hospital stay, symptomatic and asymptomatic hemorrhagic transformation, and neurological status changes as measured by the NIHSS.

Conclusions: In our experience, the inclusion of a bedside pharmacist in the stroke team during acute IV thrombolytic treatment leads to shorter door-to-needle time compared to treatment without pharmacist involvement. Further prospective studies are needed.

Disclosure of interest: No

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The utilization rate of Intravenous Thrombolysis in Asian Countries: A systematic review and meta-analysis

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Background and aims: Despite being used for over 20 years, IV thrombolysis coverage is still inadequate. Asia, which has the highest rate of acute ischemic stroke (AIS), currently lacks regional data on IV thrombolysis utilization. The purpose of this study was to provide more accurate estimates of IV thrombolysis usage for AIS in Asia.

Methods: This study, which followed PRISMA guidelines, analyzed data from Asian studies on adult AIS patients receiving IV thrombolysis. Only original, peer-reviewed observational research articles from the Asian region published in English were eligible for inclusion. The studies had to include adult AIS patients, either anterior or posterior circulation and report overall rates of IV thrombolysis. The research was conducted by searching PubMed and Google, and excluded randomized controlled trials, grey literature, and studies prior to 2010.

Results: Our analysis of 67 Asian studies revealed a 9.1% rate of IV thrombolysis. There was significant variation in thrombolysis rates across Asia, with 11.3% in HIC countries and 8.1% in LMICs, well below the American Stroke Association's target of 50%. A subgroup analysis showed that higher thrombolysis rates were associated with HIC, Central and North Asia, private hospital ownership, hospitals with stroke protocols, countries with national stroke guidelines, and studies conducted after 2015.

Conclusions: The rate of IV thrombolysis usage in the Asian region is alarmingly low. To rectify this, it is crucial to take steps such as decreasing delays in prehospital and hospital care, strengthening local infrastructure and staffing, and raising public awareness about stroke.

Disclosure of interest: No

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"Telethrombolysis: Current State of the Art"

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Background and aims: Stroke is one of the leading causes of death and disability worldwide. With the development of new treatments, including intravenous thrombolysis (IVT, clinical outcomes have improved. However, these interventions are time-dependent and there is a large disparity between rural and urban parts of the world in the availability of advanced treatments. Slovenia is a predominantly rural country with two million inhabitants and an area of 20,273 km2. Population density varies widely, from more than 1,000/km2 in Ljubljana, the capital, to as little as 5/km2 in some Alpine regions. In Slovenia, the national rate of IVT before 2015 was estimated at <3%.
Methods: Given the relatively small size of Slovenia, we have established a nationwide telemedicine system for stroke care that covers the entire country according to the principle of the hub and spoke system. The main goal of our network was to increase the use of IVT in Slovenia by using telemedicine.
Results: A constant, progressive increase in the absolute number of IVT patients in the telestroke (TeleKap) network is essential. In addition, we found a statistically significant progressive increase in the absolute number of acute stroke patients. The analysis showed a significant association between teleconsultations and the use of IVT. IVT rates hovered around 40% from 2015 to 2022.
Conclusions: Telethrombolysis has become the pinnacle of treatment for patients with acute ischemic stroke in our country. From a global perspective, the telestroke has become a reality in the treatment of cerebrovascular disease patients worldwide.
Disclosure of interest: No

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Intravenous r-tPA before thrombectomy versus thrombectomy alone up to 9 hours after onset of stroke

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Background and aims: Recent studies demonstrated the benefit of IVT up to 9 hours of stroke onset in patients without large vessel occlusion (LVO) selected by perfusion imaging. In patients with LVO, it is unknown whether extending IVT to 4.5 and 9 hours of onset before endovascular therapy (EVT) improves outcome compared to EVT alone.
Methods: We retrospectively analyzed 123 consecutive patients treated with EVT in the Geneva (N=63), Lausanne (N=29) and Lugano (N=31) Stroke Centers between 01.01.2018 and 31.12.2021, who fulfilled the following criteria i) anterior circulation occlusion, ii) favorable CT-perfusion mismatch (EXTEND criteria), iii) treatment initiation between 4.5 and 9 hours of onset or wake-upstrokes. Patients were treated with IVT before EVT (bridging) or EVT alone when IVT was contraindicated. Outcomes were compared between treatment groups using propensity score weighting.
Results: We included 42 patients in the bridging and 81 in the EVT alone groups. Patients did not differ in baseline characteristics between treatment groups. A favorable outcome at 90 days (mRS 0-2) was found in 50% of patients treated with bridging therapy and in 32% of those treated with EVT alone (P=0.047). Functional independency at 90 days (mRS 0-1) was more frequent in the bridging group (36% versus 19%;P=0.048). There were only 5 symptomatic intracranial hemorrhages (2/42 in the bridging group and 3/81 in the EVT alone group;P=0.774).
Conclusions: Our study suggests that bridging therapy could be an effective and safe treatment up to 9 hours of stroke onset, in patients with LVO selected by perfusion imaging.
Disclosure of interest: No

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PREDICTORS OF HAEMORRHAGIC COMPLICATIONS OF IV-THROMBOLYSIS FOR ACUTE ISCHEMIC STROKE WITHIN AND BEYOND THE FIRST 4.5 HOURS FROM ONSET

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Background and aims: Growing evidence suggests the use of rtPA in selected patients with ischemic stroke in the unknown or extended time from symptom onset. This study aimed to investigate the rt-PA associated bleeding risk in a longitudinal real-world-clinical cohort of patients with ischemic stroke.
Methods: This study bases on the longitudinal registry Stroke Research Consortium in Northern Bavaria (STAMINA). Patients treated with iv-thrombolysis were categorized according to the time window: I) Up to 3 hours, II) 3 – 4.5 hours and III) unknown or extended time window >4.5 hours from symptom onset. We investigated the incidence and the predictors of any and symptomatic haemorrhagic complications according to the time window categories.
Results: 786 ischemic stroke patients treated with iv-thrombolysis were included. 472 (60.1%) were treated within 3 hours from onset, 140 (17.8%) in the 3 - 4.5 hour time window and 169 (21.5%) in the unknown or extended time window. There was a trend towards higher incidence of any intracranial haemorrhage in the extended or unknown time window (16 (3.4%) vs. 10 (7.1%) vs. 11 (6.5%); p=0.088). The use of anti-platelet medication at the time of stroke onset was associated with haemorrhagic complications. The risk of symptomatic intracranial haemorrhage was similar across the three strata (5 (1.1%) vs. 4 (2.9%) vs. 5 (3.0%); p=0.161).
Conclusions: The time from onset and the use of anti-platelets predicted haemorrhagic complications. However, the rate of symptomatic ICH was low, even when treatment was initiated in the extended or unknown time from symptom onset.
Disclosure of interest: No

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Relation of International Normalized Ratio on Safety Outcomes of Intravenous tPA use in Patients with Acute Ischemic Stroke with Recent NOAC Use Prior to Stroke

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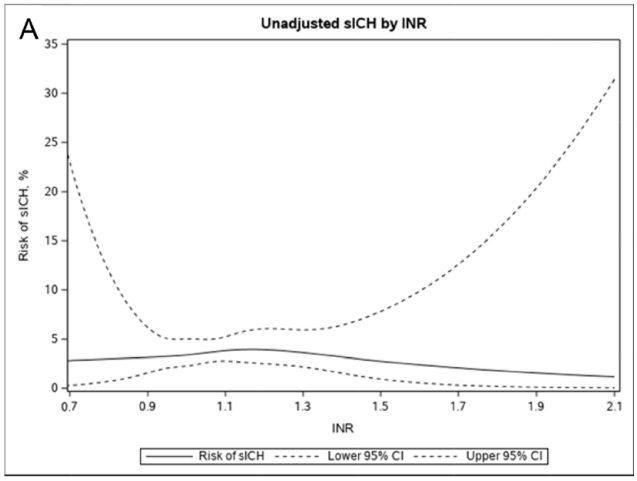

Figure 1. Relationship Between INR Values and Post-Thrombolytic Outcomes in NOAC Patients Treated with Intravenous Alteplase. Logistic regression modeling was conducted to examine the unadjusted relationship between the INR and the binary outcome of (A) sICH and (B) any alteplase-related complication in NOAC patients. The Stone and Koo additive spline method was fitted to generate the plot, with adequacy of linearity tested using the likelihood ratio statistic by comparing the linear and nonlinear models. Abbreviations: CI, confidence interval; INR, international normalized ratio; NOAC, non-vitamin K antagonist oral anticoagulant; sICH, symptomatic intracranial hemorrhage.

Background and aims: To investigate if INR levels in patients on NOAC prior to stroke correlate with safety outcomes and complications after receiving tPA
Methods: Retrospective cohort study using data prospectively collected between 4/2015 and 03/2020 in 1752 participating hospitals in the American Heart Association Get With The Guidelines-Stroke registry, with a smaller cohort from the Addressing Real-world Anticoagulant Management Issues in Stroke registry. Participants included patients with acute ischemic stroke who were treated with alteplase within 4.5 hours of symptom onset, with pre-stroke treatment with NOACs prior to alteplase administration.
Results: Of the 1569 NOAC patients with available INR results, 55 (3.5%) had sICH and 112 (7.1%) had any alteplase-related complication. Varying INR values were plotted against bleeding events and the likelihood ratio statistic was used.
Conclusions: No apparent correlations between admission INR values and post-thrombolytic bleeding complications were found among NOAC patients.
Disclosure of interest: No

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INTRAVENOUS THROMBOLYSIS OF BASILAR ARTERY OCCLUSION – A SINGLE-CENTER EXPERIENCE DURING 1995–2022

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Background and aims: Recanalization is generally considered a prerequisite for favorable functional outcome in basilar artery occlusion (BAO). Intravenous thrombolysis (IVT) with alteplase has been successfully used for eligible BAO patients well beyond the 4.5-hour time window. Still, IVT has been largely underrepresented in the best medical treatment arms in recent RCTs of recanalization therapy in BAO.
Methods: This observational single-center study reports outcomes of consecutive BAO patients treated with IVT up to 48 hours of symptom onset during 1995-2022. The primary outcome was favorable functional outcome (modified Rankin Scale 0-3) at 3 months. Secondary outcomes comprised all-cause mortality and symptomatic intracranial hemorrhage (sICH). We also analyzed factors associated with favorable outcome.
Results: Of 387 patients with acute BAO treated with recanalization therapy in our center, 247 (63.8%) received only IVT. 46.3% of these IVT-treated patients achieved 3-month favorable functional outcome, whereas mortality was 35.8%. sICH occurred in 11.0%. The patients with favorable functional outcome were younger, had less frequently diabetes, atrial fibrillation, and previous stroke, had milder symptoms, less extensive baseline ischemic changes within the posterior circulation, more often a short clot, and shorter onset-to-needle times. In a multivariable analysis, only age, symptom severity, and the extent of baseline ischemia predicted functional outcome.

Conclusions: IVT produces real-life outcomes comparable to those reported for endovascular treatment arms in recent RCTs of BAO recanalization and should not be overlooked as the first-line recanalization therapy in acute BAO, even in longer time-window.
Disclosure of interest: No

THROMBOLYSIS – EXCLUDING CLINICAL TRIAL RESULTS

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Thrombolysis outcome in patients with diabetes mellitus and previous stroke

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Background and aims: Although diabetes mellitus (DM) and a previous cerebral infarction (PCI) were considered risk factors for thrombolysis with less favorable outcome in different studies, intravenous thrombolysis has proven its efficiency in stroke care.
The study aimed to evaluate the safety and effectiveness of intravenous thrombolysis in diabetic individuals with PCI who had recently suffered an acute ischemic stroke.
Methods: Retrospective study, in which we evaluated the effectiveness of intravenous thrombolysis in terms of presence of intracerebral hemorrhage (sICH), functional outcome as measured by the modified Rankin Scale, and mortality among diabetic patients with PCI who presented with acute ischemic stroke from march 2019-march 2022.
Results: There were 87 patients included with a mean age of 67.6 $\pm$ 11.7 years (49,42 % females). Thrombolysis in patients with DM and PCI did not substantially increase the rate of sICH (20%) compared to patients with DM and no PCI (20.77%, p=0.35). However, the mortality rate was substantially higher in the DM and PCI group when compared with DM and no PCI (40% vs. 24.67%, $p<0.05$)
Conclusions: Thrombolysis may increase functional independence while not significantly increasing the risk of sICH in patients with DM with PCI. However, patients with DM and PCI and thrombolysis present a higher mortality compared to the other group.
Disclosure of interest: No

THROMBOLYSIS – EXCLUDING CLINICAL TRIAL RESULTS

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Delayed neurological improvement in acute ischemic stroke patients treated with intravenous rtPA

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Background and aims: The aim was to investigate the phenomenon of neurological improvement delayed beyond the first 24 hours from admission in acute ischaemic stroke patients, with special emphasis on intravenous thrombolysis.
Methods: This retrospective registry-based analysis included patients admitted with first-ever non-minor (NIHSS at least 4) ischaemic stroke within 24 hours from onset to a single tertiary stroke centre from January 2009 to December 2015. Patients treated with mechanical thrombectomy were excluded. Significant neurological improvement was defined as an 8-point reduction in the NIHSS score or reaching a score of 0 or 1. We compared neurological improvement at 24 h and day 7 in patients treated and not-treated with intravenous rtPA.
Results: Of N=463 included patients n=316 (68%) received rtPA and n=147 (32%) no rtPA. There were no differences in median age, gender and baseline NIHSS (10 vs 9). Patients from the rtPA group more often had coronary disease (31% vs 20%, p=0.015), lower NIHSS at 24 h (5 vs 8, p=0.005) and day 7 (3 vs 5, p=0.024). Significant neurological improvement from baseline to 24 h was more frequent in the rtPA group (28% vs 10% $p<0.001$). However, the proportion of patients achieving at day 7 significant improvement that did not occur within first 24 hours, was similar (22% vs 19%, p=0.493).
Conclusions: About 1 in 5 patients with acute ischaemic stroke achieve delayed significant neurological improvement that occurs beyond the first 24 hours from admission. Intravenous rtPA seems not to have an effect on this phenomenon.
Disclosure of interest: No

THROMBOLYSIS – EXCLUDING CLINICAL TRIAL RESULTS

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INTRA-ARTERIAL THROMBOLYSIS AS ADJUNCT TO MECHANICAL THROMBECTOMY IN ACUTE ISCHEMIC STROKE PATIENTS IN UNITED STATES: A CASE CONTROL ANALYSIS

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Background and aims: Although observational studies have reported favorable clinical outcomes associated with intra-arterial thrombolysis as adjunct to mechanical thrombectomy, the cost and length of hospitalization associated with this intervention has not been studied.
Methods: We analyzed the nationally representative data of the United States data from Nationwide Inpatient Sample (NIS) to compare hospitalization cost and duration in patients receiving intra-arterial thrombolysis (n=1,990) with those not receiving it (n=1,990) in acute ischemic stroke patients undergoing mechanical thrombectomy using a matched case control design.
Results: There was no difference in the median hospitalization cost in patients treated with intraarterial thrombolysis compared with those not treated with intra-arterial thrombolysis: $36,992 [28,361 to 54,336] versus $35,440 [24,383 to 50,438], (regression coefficient 2,485 [-1,947 to 6,917], p=0.27). There was no difference in the median length of hospitalization in

patients treated with intraarterial thrombolysis compared with those not treated with intra-arterial thrombolysis: 6 days [3 to 10] versus 6 days [4 to 10], (regression coefficient -0.34 [-1.47 to 0.80], p=0.56). There was no difference in odds of home-discharge (OR 1.02 95%CI 0.72-1.43, p=0.93), post-procedural intracranial hemorrhage (OR 1.16 95%CI 0.83-1.64, p=0.39) or in-hospital mortality (OR 1.52 95%CI 0.99-2.32, p=0.055).
Conclusions: We did not observe an increase in the cost or length of hospitalization associated with the use of intra-arterial thrombolysis as adjunct to mechanical thrombectomy in acute ischemic stroke patients. If the ongoing randomized clinical trials demonstrate therapeutic efficacy in reducing death or disability, this intervention has a high likelihood of being beneficial overall.
Disclosure of interest: No

THROMBOLYSIS – EXCLUDING CLINICAL TRIAL RESULTS

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Early recanalisation in distal and proximal basilar artery occlusions treated with intravenous thrombolysis preceding angiography

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Background and aims: Intravenous thrombolysis (IVT) is considered standard treatment in acute ischemic stroke in both posterior and anterior acute ischemic stroke regardless of large vessel occlusion. We aimed to determine the early recanalisation rate of basilar artery occlusion in its proximal (first half) and distal (second half) segments with predictive factors.
Methods: We realized a retrospective cohort study of patients with basilar artery occlusion confirmed on initial multiphase CTA who received bridging therapy between October 2018 and December 2021. Early recanalisation status was assessed on the first pass of endovascular procedure and defined as a m-TICI score ⩾ 2a. Univariate analysis were performed.
Results: Among 31 patients included (median age 71.5 years, 58.1% men), early recanalisation was documented in 10 patients (32.3%). Median onset-to-bolus and bolus-to-assessment time was 315 and 64 minutes respectively. Recanalisation was significantly more frequent in the distal segment of basilar artery (OR 8.81, 95% CI 1.60 – 79.1) where stroke etiology was predominantly cardioembolic (57.1%). Other predictive factors were shorter thrombus length on CTA (OR 0.59, 95% CI 0.38 – 0.91 for every 1mm) and good thrombus residual flow (OR 8.81, 95% CI 1.60 – 79.1). A trend favoring early recanalisation was also noted with shorter onset-to-bolus time and longer bolus-to-assessment time. Thrombus migration to distal PCA segments occurred in 6.5% (2/31).
Conclusions: Significant early recanalisation rates are observed in our study, suggesting that IVT can play an important role in management of basilar artery occlusion, particularly in cases with a distally located thrombus.
Disclosure of interest: No

THROMBOLYSIS – EXCLUDING CLINICAL TRIAL RESULTS

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Intravenous thrombolysis in posterior circulation stroke – results from the Austrian Stroke Unit Registry

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Background and aims: In randomized controlled trials (RCTs) intravenous thrombolysis (IVT) has been proven effective and safe for anterior circulation strokes (ACS). Retrospective analyses compared clinical outcomes after IVT in ACS versus posterior circulation strokes (PCS). However, direct data comparing efficacy and safety of IVT versus best medical treatment (BMT) in PCS are lacking. Here, we aimed to investigate safety and effects on functional outcome of IVT versus BMT in a large prospective multicenter registry.
Methods: Patients with PCS receiving IVT or BMT but without undergoing mechanical thrombectomy were extracted from the Austrian Stroke Unit Registry. Primary efficacy endpoint was a favorable functional outcome (mRS 0-1) at 90 days follow-up. Safety endpoint was symptomatic intracranial hemorrhage according to ECASS3 criteria (sICH). A logistic regression model and propensity score matching were used to adjust for imbalances between the groups.
Results: In total 17729 patients entered the analysis. IVT-treated patients had a higher likelihood of excellent functional outcome (adjusted OR 1.24, CI 1.01-1.53, p=0.039), but also a higher risk for sICH (OR 2.5, CI 1.63-3.77, p<0.001) as compared with BMT. In multivariate analysis, age, NIHSS on admission, macroangiopathy (all p<0.001), cardioembolism (p=0.003) and atrial fibrillation (p=0.011) were associated with an unfavorable functional outcome. NIHSS on admission (p<0.001), cardioembolism (p=0.02), hypertension (p=0.031) and atrial fibrillation (p=0.001) were independent risk factors for sICH.
Conclusions: This large real-life dataset suggests that IVT in PCS is associated with better functional outcome as compared with BMT. This is in line with the results of RCTs in ACS.
Disclosure of interest: Yes

THROMBOLYSIS – EXCLUDING CLINICAL TRIAL RESULTS

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COST-EFFECTIVENESS OF TENECTEPLASE VERSUS ALTEPLASE FOR ACUTE ISCHEMIC STROKE

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Background and aims: Alteplase is widely used as intravenous thrombolytic medication in acute ischemic stroke (AIS). Recently however, tenecteplase, a modified form of tissue plasminogen activator, has been shown to result in early recanalization, non-inferiority, and a similar safety profile in AIS patients compared to alteplase. This study aims to evaluate the cost-effectiveness of 0.25mg/kg tenecteplase versus 0.9mg/kg alteplase

for thrombolysis in AIS patients from the Dutch healthcare payer perspective.

Methods: A Markov decision-analytic model was constructed to assess total costs, total quality-adjusted life year (QALY), an incremental cost-effectiveness ratio, and incremental net monetary benefit (INMB) of two treatments at willingness-to-pay (WTP) thresholds of €50,000/QALY and €80,000/QALY over a 10-year time horizon. One-way sensitivity analysis, probabilistic sensitivity analysis and scenario analysis were conducted to test the robustness of results. Clinical data were obtained from large randomized controlled trials and real-world data.

Results: Treatment with tenecteplase saved €21 per patient while gaining 0.05 QALYs, resulting in INMB of €2,381, clearly rendering tenecteplase cost-effective compared to alteplase. Importantly, tenecteplase remained the cost-effective alternative in all scenarios, including AIS patients due to large vessel occlusion (LVO). Probabilistic sensitivity analysis proved tenecteplase to be cost-effective with a 71.4% probability at a WTP of €50,000/QALY.

Conclusions: Tenecteplase treatment was cost-effective for all AIS patients and AIS patients with LVO compared to alteplase. The finding supports broader use of tenecteplase in acute stroke care.

Disclosure of interest: No

THROMBOLYSIS – EXCLUDING CLINICAL TRIAL RESULTS

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EFFECTS OF INTRAVENOUS THROMBOLYSIS ON OUTCOMEIN STROKE PATIENTS WITH A SMALL PERFUSION LESION

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Background and aims: The role of intravenous thrombolysis in patients with both low National Institute of Health Stroke Scale (NIHSS) score and a small computed tomography perfusion lesion is unclear. This study aimed to i) describe the range of clinical severity in patients with small perfusion lesions; and ii) examine whether clinical severity was related to the outcome after lysis.

Methods: We used two prospective study cohorts, the INternational Stroke Perfusion Imaging REgistry (INSPIRE), and Northern New South Wales (NNSW) telestroke network, of acute ischemic stroke patients and identified patients with a small perfusion lesion (perfusion lesion $\leqslant$ 15 mL). Logistic regression models were used with a difference in difference approach to assessing the effect of groups based on baseline NIHSS score on the three-month clinical outcomes.

Results: A total of 734 patients' data were analysed and among them 255 (34.8%) received thrombolysis with 6 (2.4%) parenchymal haematomas. Among the 734 cases, 507 (69.1%) had an excellent clinical outcome (three-month post-stroke modified Rankin score, mRS 0-2), and 534 (72.8%) returned to the pre-morbid condition. Nonetheless, 75 (10.2%) had a poor outcome (three-month post-stroke mRS 5-6). Regarding treatment, thrombolysing patients with baseline NIHSS $>$ 4 (regardless of perfusion deficit volume) substantially reduced the odds of having poor outcome (Odds Ratio: 0.15, 95% Confidence Interval: 0.03-0.71; p-value$<$0.05).

Conclusions: The results of this large observational cohort suggest that thrombolysing patients with acute ischemic stroke who have a small perfusion lesion and at least moderate symptoms (baseline NIHSS $>$ 4) may benefit from thrombolysis.

Disclosure of interest: No

THROMBOLYSIS – EXCLUDING CLINICAL TRIAL RESULTS

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Impact of Golden Hour thrombolysis on 90-day outcomes

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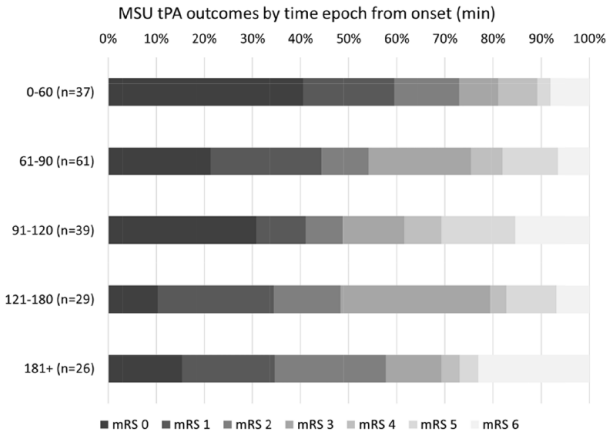
Background and aims: Mobile stroke units (MSUs) allow thrombolysis administration very early after stroke onset and enable dramatic increases in golden hour ($\leqslant$60min onset;GH) treatment. However, data on the impact on clinical outcomes of the ultra-early time windows is still limited by scarcity of cases. We therefore examined the association of progressive time epochs with 90-day modified Rankin scale (mRS) outcomes for patients treated on the Melbourne MSU.

Methods: Patients receiving pre-hospital thrombolysis on the Melbourne MSU with completed follow-up were included from 2017-2022. Distribution of 90-day mRS were analyzed for trends across 30min time epochs from onset, in addition to dichotomized GH vs non-GH time windows, using a generalized pairwise comparisons model.

Results: Of n=192 patients included, 37(19.3%) were treated in the GH. There were no significant differences in age, severity or thrombectomy need across time epochs. For every 30min delay from onset, significantly worse 90-day mRS was observed across both ordinal analysis (cOR 0.77[0.61-0.96],p=0.023) and dichotomized 0/1/baseline (aOR 0.83[0.70-0.98],p=0.029). GH-treatment was associated with substantially improved outcomes compared to non-GH for mRS ordinal analysis (cOR 1.68[1.09-2.58],p=0.018), mRS 0/1/baseline (aOR 3.43[1.48-7.95],p=0.004) and mRS 0/2/baseline (aOR 3.82[1.50-9.66],p=0.005).

Conclusions: Our data show significantly worsened 90-day outcomes for every 30min delay of pre-hospital thrombolysis, with largest decrement at the GH boundary. The proportion of those achieving return to freedom from disability or baseline decreased from 65% in the GH to 38% after 2h. This suggests the impact of ultra-early thrombolysis administration may be even more important than suggested by prior literature.



Disclosure of interest: No

THROMBOLYSIS – EXCLUDING CLINICAL TRIAL RESULTS

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Low-dose versus standard-dosealteplase for intravenousthrombolysis in patients with acuteischemic stroke

reza rikhtehgarghiasi*[1], Elyar Sadeghi[2], Abdoreza Ghoreishi[3], Payam Sariaslani[4], Shahram Rafie5[5], Alireza Vakilian[6], Ehsan Sharifipour[7], Masood Mehrpour[8], Mehdi Farhoudi[3], Mohammad Saadat Nia[9], Mohammad Mirza-Aghazadeh-Attari[3]

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Background and aims: Rates of intracranial hemorrhage (ICH) after intravenous thrombolysis (IVT) differ depending on ethnicity, one reason that few Eastern countries have approved a lower dose of alteplase. Data in this regard are scarce in the Middle Eastern region.

Methods: The present retrospective study was performed on data extracted from the Safe Implementation of Treatments in Stroke (SITS) registry.

Results: Of 6615 patients, 1055 were enrolled. A total of 86% (n = 906) received a standard dose and 14% (n = 149) received a low dose of alteplase. Favorable 3-month outcome was achieved in 481 (53%) patients in the standard group and 71 (48%) patients in the low-dose group [adjusted odds ratio (AOR) = 1.24, 95% confidence interval (CI): 0.87-1.75, P = 0.218].

Conclusions: Low-dose compared to standard-dose alteplase for patients with acute ischemic stroke (AIS) was not associated with fewer hemorrhagic events and there was no significant difference in the favorable 3-month outcome (mRS: 0-2) or mortality rate.

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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ETIOLOGIC AND PROGNOSTIC VALUE OF EXTERNAL CAROTID ARTERY THROMBUS DETECTION DURING ENDOVASCULAR THERAPY FOR ANTERIOR CIRCULATION PROXIMAL OCCLUSIONS

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Background and aims: An early understanding of stroke mechanism may improve treatment and outcome in patients presenting with large vessel occlusion stroke (LVOS) treated with mechanical thrombectomy (MT). We aimed to investigate whether spontaneous external carotid artery (ECA) embolism detection during MT is associated with stroke etiology and clinical outcome.

Methods: We retrospectively reviewed our prospectively maintained institutional data-base including consecutive patients with anterior circulation LVOS treated with MT be-tween January 2015 and August 2020.

Results: An ECA embolus was detected in 68 of 1298 patients (5.2%). The kappa coefficient for interobserver agreement was 0.89 (95% confidence interval [CI] 0.82– 0.95). ECA embolism was significantly associated with intracranial internal carotid artery (ICA) occlusion ($p < 0.001$), cardioembolic etiology ($p < 0.001$) and a lower clot burden score ($p < 0.001$). Day-1 variation of National Institutes of Health Stroke Scale score (adjusted odds ratio [OR] −2.7, 95% CI −4.9 to 0.3; p= 0.021) and delta Alberta Stroke Program Early Computed Tomography Score (adjusted OR 0.9, 95% CI 0.2 to 1.5; p= 0.004) were worse among patients with ECA emboli. There was no significant difference in 90-day functional outcome between groups (adjusted OR 0.8, 95% CI 0.42 to 1.52; p= 0.50).

Conclusions: In patients with anterior circulation LVOS treated with MT, ECA embolism was significantly associated with cardioembolic etiology, high thrombus burden and proximal intracranial ICA occlusions. This angiographic pattern might provide a valuable etiologic clue to the underlying cause of anterior circulation LVOS and may also help determine the appropriate revascularization strategy.

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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Angiographic Tapering Sign as a Surrogate Marker for Large-Vessel Occlusion due to Intracranial Atherosclerotic Stenosis and Its Clinical Implication: A Retrospective-Matched Case-Control Study

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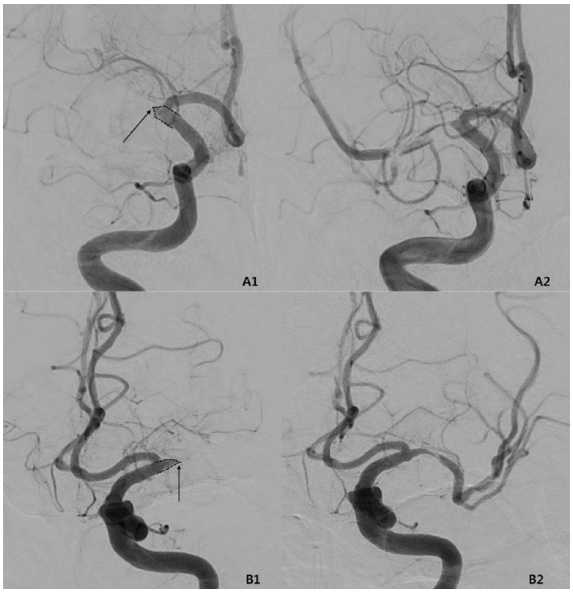
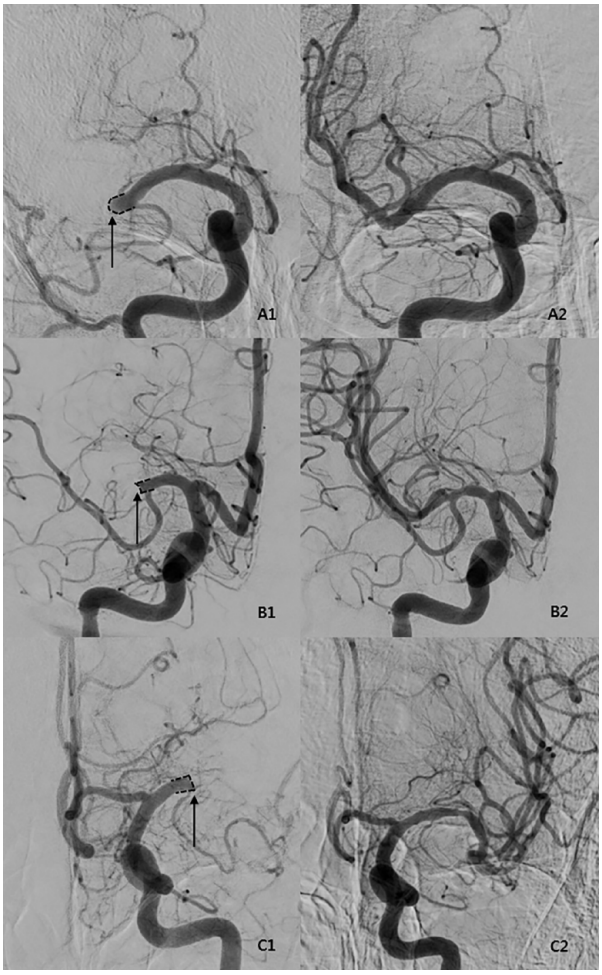
Background and aims: This study was to investigate whether the initial digital subtraction angiographic (DSA) appearance of the occlusion during mechanical thrombectomy (MT) can help distinguish the nature of the underlying lesion and predict radiological and clinical outcomes.

Methods: We retrospectively reviewed cases of patients with acute ischemic stroke who underwent MT for anterior circulation occlusion between March 2017 and February 2020. Underlying intracranial atherosclerotic stenosis (ICAS) was determined based on the presence of fixed stenosis after endovascular treatment. Patients were categorized based on the appearance of the occlusion observed in the initial DSA as tapering sign (+) or (-) groups. We performed 1:2 propensity score matching to establish a proper control group among the tapering sign (-) group. We analyzed and compared baseline characteristics and clinical outcomes between two groups.

Results: Overall, 293 patients (+, n=47; -, n=246) were included in the analysis. The procedure time of MT was significantly longer for the tapering sign (+) group, and successful recanalization rate after MT was significantly lower in the tapering sign (+) group than that in the (-) group. Logistic regression showed that ICAS-related occlusion was strongly associated with positive angiographic tapering sign, and angiographic tapering sign was a negative factor for the first-pass effect during MT. However, 3 months of good functional outcome was not significantly associated with the angiographic tapering sign.

Conclusions: The tapering sign on the initial DSA could be a surrogate marker for ICAS-related occlusion and procedural difficulty. However, its clinical significance remains unclear.





Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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ENDOVASCULAR TREATMENT FOR ACUTE BASILAR ARTERY OCCLUSION: A FRAGILITY INDEX META-ANALYSIS

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Background and aims: High-quality evidence are insufficient so far to support the use of endovascular treatment (EVT) for acute basilar artery occlusion (BAO).
Methods: We conducted a systematic review and meta-analysis including all randomized-controlled clinical trials (RCTs) that investigated efficacy and safety of EVT in addition to best medical treatment (BMT) versus BMT alone for BAO. The primary outcome of interest was good functional outcome at 3-months, defined as a modified Rankin Scale score (mRS-score) of 0-3. Secondary outcomes included functional independence at 3-months (mRS-score 0-2), reduced disability at 3-months (1-point reduction across all mRS-grades), symptomatic intracranial hemorrhage (sICH), any ICH and mortality at 3-months. The random-effects model was used, while the fragility index (FI) was calculated for dichotomous outcomes of interest.
Results: Four RCTs were included comprising a total of 988 patients with acute BAO. EVT was related to higher likelihood for good functional outcome (RR:1.54; 95%CI:1.16-2.05; I^2=60%), functional independence (RR:1.83; 95%CI:1.08-3.08; I^2=79%) and reduced disability at 3-months (adjusted common OR:1.96; 95%CI:1.26-3.05; I^2=59%) compared to BMT alone. Despite that EVT was associated with a higher risk for sICH (RR:7.78; 95%CI:2.36-25.61; I^2=0%) and any ICH (RR:2.85; 95%CI:1.50-5.44; I^2=16%), mortality at 3-months was lower compared to BMT alone (RR:0.76; 95%CI:0.65-0.89; I^2=0%). However, sufficient robustness was not evident in any of the reported associations (FI<10). The former associations were predominantly driven by RCTs with recruitment limited in China.
Conclusions: EVT appears to be effective and safe in BAO; however, caution is needed for the interpretation and generalizability of these results.
Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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DECOMPRESSIVE CRANIECTOMY FOR MALIGNANT CEREBRAL EDEMA IN PATIENTS WITH MECHANICAL THROMBECTOMY FOR STROKE

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Background and aims: Malignant cerebral edema is a life-threatening complication after stroke. We focused on the clinical impact of decompressive craniectomy (DC) in patients after mechanical thrombectomy (MT) for large vessel occlusion.
Methods: Patients from our center's registry (1306 patients who underwent MT between 2008 and 2022, most of whom received simultaneous intravenous thrombolysis (IVT)) who underwent DC for malignant cerebral edema were included in the retrospective study. Neurological deficit was assessed with National Institutes of Health Stroke Scale and clinical outcome with modified Rankin scale (mRS). With regard to the extent of cerebral impairment, we consider the achievement of walking ability mRS ⩽ 4 as a good result. Predictors of clinical outcome were evaluated.
Results: DC was performed in 52 patients (4% of all performed MT). There were 46 patients from the anterior circulation. A relatively good clinical result (mRS ⩽3) was achieved by 13% within 3 months and 22% within 1 year. A satisfactory result (mRS ⩽ 4) was achieved by 22% within 3 months and 24% within 1 year. Three-month mortality was 41%. In patients younger than 61 years, 46% achieved a good outcome (mRS ⩽3). A predictor of a poor outcome was age, the presence of comorbidities (ischemic cardiopathy, hyperlipidemia), the presence of symptomatic bleeding before DC and unsuccessful recanalization during MT.
Conclusions: Malignant edema after stroke has a poor prognosis. However, even patients with DC performed in early follow-up to MT can achieve a relatively good clinical condition after intensive rehabilitation.
Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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Timing of symptomatic carotid artery stenting is associated with clinical outcomes: a Korean nationwide cohort study

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Background and aims: The optimal timing for carotid artery stenting (CAS) in patients with symptomatic carotid artery stenosis is unknown. We aimed to investigate whether performing CAS within 2 weeks after a stroke resulted in satisfactory outcomes in real-world practice.
Methods: Symptomatic carotid artery stenosis patients between 2008 and 2018 were enrolled using the Senior Cohort data provided by the Korean National Health Insurance service. A patient diagnosed with ischemic stroke (IS), transient ischemic attack, or amaurosis fugax within 180 days after CAS was considered to have symptomatic disease, operatively. Based on the time between CAS implementation and stroke diagnosis, patients were divided into four groups (Groups I: 0–7, II: 8–14, III: 15–30, and IV: 31–180 days). The primary outcomes were death, IS, acute myocardial infarction, and a composite of these three outcomes at 30 days, 90 days, and 1 year.
Results: We identified 1,292 symptomatic cases. There were 787, 166, 145, and 194 cases in groups I, II, III, and IV, respectively. At 90 days, the composite outcome incidence was 12.6% in total and 15.0%, 13.3%, 8.3%, and 5.7% in the same groups, respectively. Adjusted analyses revealed a

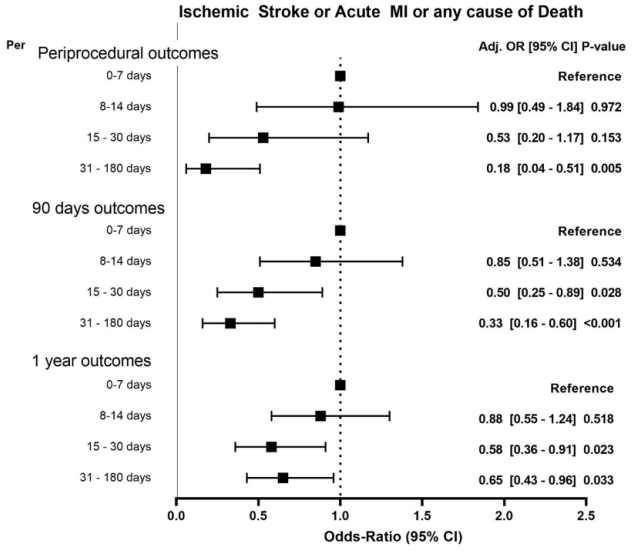

Figure. Multivariate analyses on the composite outcomes.

decreased risk for the composite outcome in group IV at 30 days and groups III and IV at 90 days and 1 year, compared to group I.
Conclusions: We suggest that the clinical outcome of CAS might be worse for symptomatic patients when treatment is commenced immediately after an IS.
Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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TANDEM OCCLUSIONS – TO STENT OR NOT TO STENT? A NORTHERN IRISH OBSERVATIONAL STUDY

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Background and aims: Tandem occlusion of the extra-cranial internal carotid artery (EICA) and intracranial circulation occurs in 10-20% of large vessel occlusion ischaemic stroke. International registry data have yielded incongruous results regarding the efficacy of acute stenting of the EICA during mechanical thrombectomy (MT). We compared clinical outcomes for patients with tandem occlusions treated at a national thrombectomy centre over eight years.
Methods: Patients treated with MT were prospectively recorded between 2014- 2021. Patients with tandem occlusions were treated with intravenous thrombolysis, MT, EICA stenting and intra-procedural antiplatelets as per operator discretion. We compared baseline clinical data, procedural information, and clinical outcomes for patients with and without stenting of the EICA. Primary outcome measure; 3-month functional independence (mRS 0-2). Secondary outcome measures; 90-day mortality, symptomatic intracranial haemorrhage (sICH) and stent occlusion.
Results: 686 patients underwent MT; 115(17%) had tandem occlusions. 96 patients met the inclusion criteria, 30 patients had acute EICA stenting (31%). Patients who were stented had greater functional independence at 90-days (mRS 0-2: 70% vs 46%; p=0.025). A trend towards lower rates of sICH and 90-day mortality were observed in the stented group. For patients with follow-up imaging, stent occlusion occurred in 12/21 patients (57%). On multivariate analysis, adjusting for differences in baseline NIHSS, EICA stenting no longer affected functional outcome (OR 2.5 (95%CI: 0.9-6.8)).
Conclusions: Stenting of the EICA during MT was not associated with improved functional outcomes at 90-days. Stent occlusion rates were high. Factors affecting stent patency require further investigation.
Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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EXTERNAL VALIDATION OF CLINICAL RISK PREDICTION SCORE FOR MECHANICAL THROMBECTOMY IN THE ELDERLY

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Background and aims: Researchers in Denmark recently developed a clinical risk prediction score (CRPS) for functional outcome after anterior circulation mechanical thrombectomy (MT) in patients ⩾80 years. The aim of this study was to assess predictors of functional outcome and validate the prediction model
Methods: Consecutive patients from the Oslo Acute Stroke Reperfusion registry (OSCAR) treated with emergent MT were assessed. Clinical, procedural and radiological parameters and functional outcome measures after 3 months were used to calculate the CRPS. We performed univariate, bivariate, logistic regression and receiver-operating curve (ROC) analyses.
Results: Of 1028 consecutive patients treated with MT, 223 with anterior circulation occlusion were ⩾80 years. Fair outcome, defined as modified Rankin scale ⩽3 (mRS) was found in 51.6%. Female sex was significantly associated with poor outcome, mRS⩾4 (p=0.014), as well as increasing age (p=0.014). Poor outcome was associated with baseline National Institute of Health Stroke Scale (NIHSS, $p<0.001$), pre-stroke mRS ($p<0.001$) and low Alberta Stroke Program Early Computed Tomography score (ASPECTS, p=0.003) in bivariate analyses. Significant predictors for outcome in regression analyses were: Pre-stroke mRS, adjusted odds ratio, aOR= 0.59 (95% CI: 0.46–0.77). NIHSS, aOR= 0.90 (95% CI: 0.85–0.95). ASPECTS aOR= 1.2 (95% CI: 1.02–1.42). The area under the curve (AUC) using the calculated CRPS was 0.75.
Conclusions: The CRPS can be a useful tool in the clinical decision making for MT in the elderly. Other variables may still be included in the model to increase its accuracy.
Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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Technical outcomes of transradial versus transfemoral access for diagnostic cerebral angiography: a systematic review and meta-analysis

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Background and aims: The transradial access (TRA) has been gradually accepted by neurointerventionalists, which was reported superior in access-site complications over transfemoral access (TFA). But disputes remained unsolved in terms of the technical outcomes in diagnostic cerebral angiography. We focused on diagnostic cerebral angiography and aimed at comparing the technical outcomes of TRA versus TFA through a systematic review and meta-analysis.
Methods: A systematic literature review and meta-analysis was conducted by searching the PubMed, Embase, and Cochrane Library databases with the relevant terms. Randomized controlled studies and cohort studies which directly compared the technical outcomes of TRA and TFA were selected. The primary outcome was procedure time, and the secondary outcomes were radiation exposure, fluoroscopy time and contrast agent volume. The Newcastle-Ottawa Scale (NOS) was used for assessing risks of bias.
Results: Of 3462 records identified, 5 studies were selected for quantitative synthesis, including 2583 patients undergoing diagnostic cerebral

angiography. The pooled data indicated significantly shorter procedure time in TRA than TFA. Also, TRA showed lower radiation exposure. There was no significant differences between TRA and TFA in fluoroscopy time, but the heterogeneity was considerable. The contrast agent volume revealed non-significant differences between TRA and TFA.
Conclusions: In this meta-analysis, TRA is superior to TFA in terms of the procedure time and radiation exposure, and not inferior on contrast dose in diagnostic cerebral angiograph. But due to small number of studies and high bias risks, it required further high-quality clinical validation.
Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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Endovascular thrombectomy in anterior circulation large vessel occlusion stroke for patients over the age of 80: Results from the SITS Registry

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Background and aims: Few patients over the age of 80 were included in the pivotal endovascular thrombectomy (EVT) large vessel occlusion (LVO) stroke clinical trials. We aimed to investigate outcomes after EVT treatment for anterior LVO stroke patients aged >80.
Methods: We analysed data from the SITS International Stroke Treatment registry. We compared patients aged >80 treated within 4.5 hours from stroke onset with EVT· intravenous thrombolysis (IVT) to IVT alone. Primary outcome was 3-month functional independence defined as modified Rankin Scale (mRS) 0-2. Secondary outcomes were symptomatic intracerebral haemorrhage (SICH) by SITS-MOST definition, and death by 3-month follow-up. Propensity score matching (PSM) using nearest neighbour matching including relevant clinical predictors was used to find comparable patients.
Results: PSM included 1338 patients in each group (mean age 86, median NIHSS 16). Occlusion sites were intracranial ICA (7.1% vs. 7.8%, p=0.56), M1 (62.7% vs. 58.3%, p=0.02) and M2 (29.4% vs. 32.5%, p=0.09). EVT treated patients (81% successful recanalization, 73% received IVT, mean onset to IVT 145min) had similar 3-month mRS 0-2 (29.3 vs 29.5%, p=0.84) and SICH (1.7 vs 1.9%, p=0.96), and a trend towards lower proportion of death (32.9 vs 39.2%, p=0.05), as compared to IVT treated patients (mean onset to IVT 156min).
Conclusions: We observed similar functional independence and SICH and a trend towards lower proportion of death in patients aged >80 treated with EVT · IVT compared to IVT alone. A higher proportion of M1-occlusions in the EVT · IVT group and other unmeasured or unadjusted factors may have influenced our results.
Disclosure of interest: No

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DEVELOPMENT OF A BIOACTIVE COATING TO IMPROVE THE PERFORMANCE OF THROMBECTOMY DEVICES

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Background and aims: Mechanical thrombectomy (MT) procedures often fail to capture clots during the first passage of retrieval devices and clot fragments generated during the procedure adversely impact patients. We hypothesized that the dense meshes of extracellular DNA, which are consistently found in stroke-related clots, could serve as clot-anchoring platform and evaluated potential benefits of a coating made of DNA-interacting compounds that is placed onto the surface of clot retrieval devices to promote adhesion to clots and emboli.
Methods: Fifteen different known DNA-binding molecules were immobilized on flat nitinol discs to observe their binding capacity to extracellular DNA derived from human blood neutrophils upon stimulation with nigericin. Sample molecules were counter-screened to evaluate their adhesion to fluid blood elements using PPAK-anticoagulated fresh human peripheral whole blood. Two top performing molecules were used to coat Solitaire® MT devices to evaluate their ability to aid the capture and retrieval of clots and to reduce the creation of emboli during procedures in a 3D phantom M1 occlusion model.
Results: Samples coated with all 15 compounds displayed increased capture of extracellular DNA (≈ 3-fold) and decreased adhesion of blood elements (≈ 5-fold), as compared to the bare alloy nitinol disks, *in vitro*. Functional testing of Solitaire® MT devices showed that the coating with DNA-binding compounds consistently improved the capture of the clot and significantly reduced the rate of distal embolization.
Conclusions: Our results suggest that clot retrieval devices coated with DNA-binding compounds can considerably improve the outcome of the MT procedures in stroke patients.
Disclosure of interest: No

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Clinico-biological predictors of futile recanalization in posterior circulation stroke

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Clinico-biological predictors of futile recanalization in posterior circulation stroke

Background and aims: In posterior circulation strokes (PCS), mechanical thrombectomy (MT) has improved the prognosis. However, futile recanalization (FR) rates are much higher than in the anterior circulation strokes. Our aim was to identify risk factors associated with futile recanalization in PCS.

Methods: A retrospective single-center analysis of all PCS who underwent MT prospectively included in a registry between 2017-2021 was performed. FR was defined as a modified Rankin Scale (mRS) of 4-6 at 90 days despite a successful recanalization(TICI 2b-3). Good clinical outcome was defined as mRS 0-3 at ninety days. Ordinal logistic regression analysis was performed to investigate the predictors of FR.

Results: Among 2133 MT included, 213 were performed in posterior circulation, TICI 2b-3 rate was 87.3% (N=186).Median (IQR) age and admission NIHSS were 71.5 (61-80) and 11 (5-19) respectively. FR rate was 41.9% (N=78). Univariate analysis demonstrated risk factors related to FR: higher FAZEKAS grades (2-3)[OR=2.32, 95%CI (1.72-4.23), P=0.006], poor BATMAN score (0-6), [OR=1.97,955CI(1.05-3.71), p=0.034],poor PC-CS score (0-5) [OR=2.27, 95%CI (1.23-4.17),p=0.008], Admission NIHSS⩾10 [OR=3.35, 95%CI (1.76-6.37), p<0.001],admission glycemia >170mg/dl [OR=2.24, 95%CI(1.16-4.33),p=0.016], general anesthesia use[OR=4.70,95%CI(2.40-9.19), p<0.001groin-to-recanalization > 60 minutes [OR=4.25, 95%CI(1.80-10.30), p<0.001]. After adjusting per confounders, admission NIHSS>10 [OR=2.10,95%CI(1.04-4.24), p=0.039], general anesthesia use [OR=2.85,95% CI (1.34-6.03), p=0.006] and groin to recanalization >60 minutes [OR=3.18, 95%CI(1.23-8.22),p=0.017] were identified as independent predictors of FR

Conclusions: Futile recanalization in posterior MT strokes is related to higher admission NIHSS, general anesthesia use and with longer groin-to-recanalization time.

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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OUTCOMES OF MECHANICAL THROMBECTOMY IN ORALLY ANTICOAGULATED PATIENTS WITH ANTERIOR CIRCULATION LARGE VESSEL OCCLUSION. ANALYSIS FROM THE IMPERIAL COLLEGE THROMBECTOMY REGISTRY

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Background and aims: To compare the safety of mechanical thrombectomy (MT) for anterior circulation large vessel occlusion (LVO) between stroke patients on oral anticoagulation (OAC) and those not on OAC.

Methods: This is a single-center prospective study. Demographic, neuroimaging and clinical data were compared in patients on oral anticoagulation (OAC) vs those not on OAC. Study outcomes were functional independence and mortality at 90 days, rate of symptomatic intracranial hemorrhage (sICH). Backward stepwise logistic regression was implemented to weight the predictive value of anticoagulation at baseline on predefined outcomes. Nearest neighbour propensity score matching was applied to control for age, sex, previous stroke and CHADSVASC score.

Results: Overall, 573 patients were included (96 OAC group vs 477 no OAC group). People in OAC group were older, with higher CHADSVASC score, and less frequently received thrombolysis (22 vs 82%, p=.02). Rates of functional independence and sICH were similar in OAC and no OAC group, with a relative 11% excess mortality in OAC group (27 vs 16%, p=.04). Logistic regression revealed no impact of OAC at baseline on functional independence outcome (OR=0.51, 95%CI=0.08-3.12), confirmed after propensity score matching (OR=0.70, 95%CI=0.12-4.00).

Conclusions: According to our findings oral anticoagulation at baseline does not represent a major limitation to achieve functional independence outcome when reperfusion treatments are provided according to the standard guidelines.

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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Endovascular treatment in patients with acute ischemic stroke and low NIHSS scores. The ALOWS (Andalusian LOW NIHSS Stroke recanalization) Study for anterior circulation stroke

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Background and aims: The success of the thrombectomy trials has resulted in a significant change in management of acute ischemic stroke. However, it is still unclear how to manage patients that present with low NIHSS score. We sought to review our experience of endovascular treatment (EVT) in patients with low NIHSS and anterior circulation vessel occlusion.

Methods: From a prospectively maintained database (ARTISTA), we retrospectively reviewed cases of acute ischemic stroke which underwent EVT in two centers with a high volumen of care between 2017-2021. We included all patients with anterior circulation stroke and low NIHSS (⩽8) on admission. We established 3 different groups in relation to the presenting NIHSS: group-1 (NIHSS:0-2), group-2 (NIHSS:3-5), and group-3 (NIHSS:6-8). We collected demographic, radiological, procedural and outcome data.

Results: We included 528 patients: 62, 148, and 318 in each group respectively. The mean age was 63.5, 67, and 72, respectively, with a total of 302 male patients. Associated medical conditions were common in all three groups. Over 80% presented with occlusion of ICA, M1 or M2, including tandem-occlusions. Successful recanalization (TICI⩾2b) was obtained in 95.1%,88.4%, and 87.1%, respectively, and symptomatic

hemorrhage was observed in 4.8%, 2.1%, and 3.2%. At 90-day follow-up, 83.9%, 83.7%, and 72.9% of the patients had mRS 0-2, including 80.4%, 74.1%, and 55.9% with mRS 0-1, respectively

Conclusions: EVT in patients with anterior circulation stroke and low NIHSS is possible and successful with a good safety profile, and should be considered for these patients.

Disclosure of interest: No

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ENDOVASCULAR THERAPY DELAY FOR ACUTE LARGE VESSEL OCCLUSION IS ASSOCIATED WITH WORSE FUNCTIONAL OUTCOME AND INCREASED MORTALITY - QUANTIFIED

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Background and aims: Early mechanical thrombectomy (MT) improves functional outcomes for patients with acute LVO. It has been shown that earlier MT resulted in reduced hospital stay and more desirable living situation at 90 days after stroke. We hypothesized that delay in MT in patients with LVO would result in worse clinical outcome and increased mortality.

Methods: We performed a retrospective analysis of patients who underwent MT for LVO in a comprehensive stroke center (2018 - 2021.) We compared outcomes including in-hospital mortality and 90-day mRS based on time from door-to-puncture and door-to-reperfusion, adjusting for covariates using logistic regression.

Results: Every 10-minute delay to reperfusion decreased the probability of mRS 0-2 at 90 days (OR 0.99, 95%CI 0.98 – 0.99, p=0.002), increased the probability of inpatient mortality (OR 1.01, 95%CI 1.00 - 1.01, p=0.01), and increased probability of 90-day mortality (OR 1.01, 95%CI 1.00 - 1.01, p=0.005.) Adjusting for baseline characteristics (p=0.01), PMH (p=0.01), admission labs and vital signs (p=0.002), initial stroke assessment and management (p=0.001), delayed times to reperfusion worsened 90-day mRS. After adjusting for the same groups of variables, delayed times to puncture and reperfusion also increased significantly ($p<0.05$) the probability of mortality while inpatient and at 90 days.

Conclusions: Shorter times to puncture and reperfusion impact mRS and mortality in LVO stroke patients. Adequate hospital protocols and education may lead to faster and more efficient stroke activations leading to a shorter time to MT and reperfusion. Goals of door-to-puncture must be established in order to achieve better outcome.

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

1229

MECHANICAL THROMBECTOMY WITH INTRA-ARTERIAL THROMBOLYSIS VERSUS MECHANICAL THROMBECTOMY ALONE IN PATIENTS WITH ACUTE ISCHEMIC STROKE: A SYSTEMIC REVIEW AND META-ANALYSIS

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Background and aims: There is conflicting evidence as to whether intra-arterial (IA) thrombolytics add any additional benefit in patients undergoing mechanical thrombectomy (MT).

Methods: We identified 18 studies (3 matched comparisons, 14 unmatched comparisons, and 1 randomized comparison since January 2012 using the PRISMA guidelines. Study quality were scored by the Newcastle-Ottawa Quality Scale (NOS) and revised Risk of Bias (RoB-2) tool. Mantel-Haenszel random-effect model derived odds ratio [OR] with 95% CI were used to identify the effect of IA thrombolysis on various post MT outcomes.

Results: The OR of functional independence (modified Rankin Scale [mRS] 0-2) at 90 days was 14% higher (OR 1.14, 95% CI 0.95, 1.37, $p = 0.166$, 16 studies involving 7572 patients) with IA thrombolysis with moderate between-study heterogeneity ($Q=24.22$, $p = 0.0615$, $I2=38.1\%$). The odds of functional independence (non-significantly) increased when analysis was restricted to studies that were either matched or randomized comparison (OR 1.28, 95% CI 0.92-1.78, $p = 0.149$) or those with high quality grade, (OR 1.24, 95% CI 0.97-1.58, $p = 0.082$). The OR of symptomatic intracranial hemorrhage (sICH) was 19% higher (OR 1.19, 95% CI 0.89-1.58, $p = 0.246$, 17 studies involving 8231 patients) with IA thrombolysis with low between-study heterogeneity ($Q=11.8$, $p = 0.7576$, $I2=0\%$).

Conclusions: The odds of functional independence appeared higher with IA thrombolysis and MT compared with MT alone particularly in high quality comparisons. However, the odds of sICH were also higher highlighting the need for randomized clinical trials to identify the risk benefit ratio.

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

1235

First-Pass Effect in Basilar Strokes with Mild, Moderate and Severe Initial Symptoms

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Background and aims: Randomized trials demonstrating the benefit of thrombectomy for basilar strokes have enrolled an insufficient number of patients with an NIHSS<10 and shown discrepant results for patients with an NIHSS>20. Achieving a First-Pass Effect (FPE) improves clinical outcomes in basilar strokes. We aimed to evaluate the effect of FPE on outcomes based on pre-thrombectomy initial NIHSS score.

Methods: We retrospectively analysed the prospective multicentric ETIS registry, including 279 patients from 6 participating centres treated with thrombectomy. We compared the 90-day clinical outcomes of FPE to non-FPE on patients based on their initial clinical severity: mild (NIHSS<10), moderate (NIHSS 10-20) and severe (NIHSS>20). We used Poisson Regression with robust error variance to determine the effect of the NIHSS score on the association between FPE and outcomes.
Results: Patients with an NIHSS<10 and NIHSS 10-20 treated with FPE for basilar stroke had a significantly higher risk of a 90-day favourable clinical outcome (mRS 0-3) compared to patients not treated with FPE (RR=1.32, 95% CI:1.04, 1.66, p-value=0.0213, and RR=1.79, 95% CI:1.26, 2.53, p-value=0.0011, respectively). Such benefit was not found in patients with an NIHSS>20. We found a significantly lower risk of a very poor 90-day clinical outcome (mRS 4-5) and mortality in FPE patients with an NIHSS 10-20 but not amongst patients with an NIHSS>20. (**Figure 1**)
Conclusions: Achieving an FPE significantly improves outcomes amongst patients with initial mild (NIHSS<10) or moderate (NIHSS 10-20) symptoms; however, our study did not demonstrate any benefit amongst patients with initial severe symptoms (NIHSS>20).

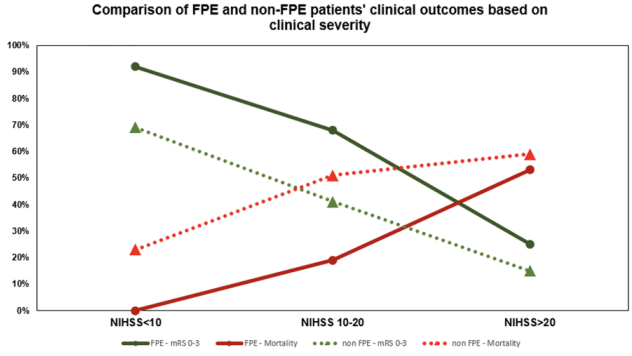

Figure 1: Rates of good clinical outcome (mRS 0-3) and mortality for FPE and non-FPE patients treated with thrombectomy for basilar stroke amongst various ranges of clinical symptoms: mild (NIHSS<10), moderate (NIHSS 10-20), and severe (NIHSS>20).

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

1314

FACTORS INFLUENCING CLINICAL RESULTS OF ENDOVASCULAR TREATMENT FOR ACUTE ISCHEMIC STROKE DUE TO TANDEM LESION IN ANTERIOR CIRCULATION: RESULTS PROM THE ASCENT STUDY

Roman Havlicek*[1,2], Daniel Sanak[1], David Cernik[3], Zuzana Gdovinova[4], Jarmila Neradova[3], Norbert Lesko[4], Martin Kocher[5], Filip Cihlar[6], Jozef Malik[7], Jakub Fedorko[8], Piotr Pedowski[8], Jana Zapletalova[9], Martin Sramek[2]
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Background and aims: Endovascular treatment (EVT) of tandem lesion (TL) in anterior circulation (AC) acute ischemic stroke (AIS) represents still clinical challenge. We aimed to evaluate a possible impact of clinical, laboratory and other selected parameters on clinical outcome after EVT.
Methods: AIS patients with TL in AC treated with EVT were enrolled in the multicenter retrospective ASCENT study. A good 3-month clinical outcome was scored as 0-2 points in modified Rankin Scale (mRS) and achieved recanalization using the TICI scale. Logistic regression analysis (LRA) was used for the assessment of possible predictors of good 3-month outcome with adjustment for potential confounders.
Results: In total, 238 (67.6% males, mean age 67.4 ± 10.3 years) patients with median of admission NIHSS 15 were analyzed. Recanalization (TICI 2b-3) was achieved in 229 (96.2%) patients, and 131 (55.0%) had mRS 0-2. Besides generally known predictors of good outcome after EVT, the stent patency within first 30 days after EVT (p=0.0005, OR: 0.182), dual antiplatelet therapy started within 12 hours after stenting (p=0.0001, OR: 4.258) and statin therapy started within 24 hours after stenting (p=0.001, OR: 6.375) were found as predictors. Multivariate LRA confirmed after adjustment the stent patency as predictor of good outcome (p=0.003, OR: 0.157).
Conclusions: Very early start of dual antiplatelet and statin therapy after EVT and stent patency within first 30 days after EVT were found as predictors of good 3-month clinical outcome in AIS patients treated for TL. Study was supported by grant IGA-KZ-2021-1-15 and by IGA LF UP_009_2023.
Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

1496

Study of Vascular Dissection in the Treatment of Intracranial Atherosclerotic Stenosis with Balloon Angioplasty: Proposal of a New Angiographic Classification

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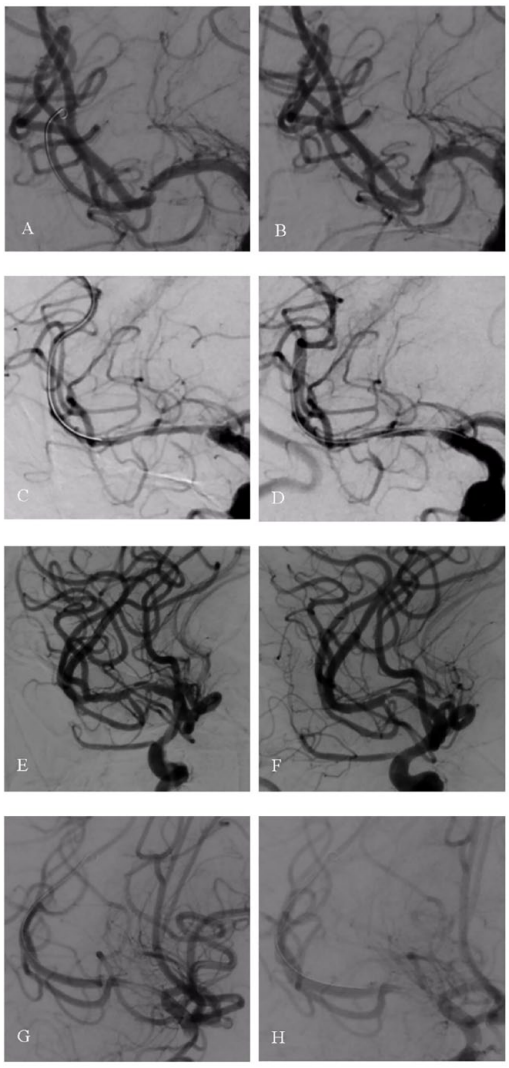
Background and aims: Vascular dissection is the most common complication in the treatment of intracranial atherosclerotic stenosis (ICAS) with balloon angioplasty. We propose a new classification of dissection in angiographic.
Methods: Patients were divided into dissection group and non-dissection group with symptomatic ICAS who received balloon dilatation alone in a tertiary stroke center. A new classification method is proposed. Type I: The blood perfusion rate of the diseased vessel is the same as normal. Type IIa: The blood flow rate slows down less than 0.5s. Type IIb: Partial small branches were incomplete or disappeared. Blood flow rate was more than 0.5s and less than 1s. Type III: The blood flow rate was slower than 1s.
Results: Vascular dissection occurred in 30 of the 100 patients. There were 5 cases for type I, 7 cases for type IIa, 15 cases for type IIb, and 3 cases for type III. One patient with type IIb had ischemic stroke in perioperative period. Recurrent stroke was observed in 3 patients with type IIb. Further analysis showed that the incidence of total adverse events was significantly higher than that of type I~IIa (P=0.002).
Conclusions: The clinical outcomes of type IIb and above is worse than that in type I~IIa, which may require active remedial treatment. The new



Typical vascular dissection: A~B: type I; C~D: type IIa; E~F: IIbIIG~H: type III

classification of vascular dissection provides a new idea for clinical decision-making.

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

1627

MECHANICAL THROMBECTOMY WITH THE NEVATM STENT RETRIEVER: REAL-WORLD EXPERIENCE AT A TERTIARY CENTRE

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Background and aims: The NeVa™ is a novel hybrid-cell stent retriever with functional zones to incorporate and trap resistant emboli. Our aim is to describe the safety and efficacy of this stent.

Methods: We conducted a retrospective study of a prospective collected database at a regional level in the Comunidad Valenciana from January 2020 to July 2022.

Results: We included 272 patients, 59% men. Median presenting NIHSS was 15. 82 of 272 (30%) were treated with NeVa™. There were no differencies in reperfusion rates (mTICI $\geqslant$ 2b) according to the device (80% vs 80% p = 1.00). A high percentage of first pass effect was identified with the other devices compared to NeVa™ (47% vs 33% p = 0.09). NeVa™ presented a high rate of intracerebral hemorrhagic (ICH) (60% vs 24% p = 0.00) but there were no differences in intraparenchymal hemorrage according to Heidelberg classification. When we considered symptomatic intracerebral hemorrhagic (sICH) according to ECASS II, patients treated wiht other devices presented a high rate of sICH (20% vs 5% y p = 0.10).

No differences were found in functional outcome (mRS 0-2) at 90 day. However, patients treated with NeVa™ presented a high mortality rate at 90 day (56% vs 32%, p = 0.03).

Conclusions: In our series, NeVa™ demonstrated high rates of asymptomatic ICH. We suggest it could be related to the number of passes needed (> 1). Moreover, NeVa™ presented a high mortality rate at 90 day, but it was not due to sICH.

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

1654

FACTORS INFLUENCING STENT PATENCY AFTER ENDOVASCULAR TREATMENT FOR ACUTE ISCHEMIC STROKE DUE TO TANDEM LESION IN ANTERIOR CIRCULATION: RESULTS FROM THE ASCENT STUDY

David Cernik*[1], Roman Havlicek[2,3], Daniel Sanak[2], Jarmila Neradova[1], Norbert Lesko[4], Zuzana Gdovinova[4], Martin Kocher[5], Filip Cihlar[6], Jozef Malik[7], Piotr Pedowski[8], Štefan Pataky[8], Jana Zapletalova[9]

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Background and aims: Endovascular treatment (EVT) of tandem lesion (TL) in anterior circulation (AC) acute ischemic stroke (AIS) mostly includes carotid stenting (CAS). We evaluated factors influencing the patency of stent during the first 30 days after EVT.
Methods: AIS patients with TL in AC treated with EVT were enrolled in the multicenter retrospective ASCENT study. Patent stent (PST) was assessed using ultrasound within the first seven and 30 days after EVT. A good 3-month clinical outcome was scored as 0-2 points in modified Rankin Scale (mRS). Logistic regression analysis (LRA) was used for the assessment of predictors of stent patency.
Results: In total, 238 (67.6% males, mean age 67.4 ± 10.3 years) patients were analyzed. The occluded stent (OST) was found in 25 (10.5%) patients within the first seven days and 37 (15.5%) patients had OST within 30 days after EVT and 12 (32.4%) of them reached mRS 0-2. LRA showed dual antiplatelet therapy (DAPT) started within 12 hours after EVT (p=0.0003, OR: 0.141) and prior used of statins (p=0.045, OR: 0.221) only predictors for PST within first 7 days after EVT, and DAPT started within 12 hours after stenting (p=0.0001, OR: 0.113) only predictor for PST within the first 30 days after EVT.
Conclusions: Very early start of DAPT after EVT and prior use of statins were found only predictors of PST within the first 30 days after EVT. 67.6% patients with early OST had poor 3-month outcome. Study was supported by grant IGA-KZ-2021-1-15 and by IGA_LF_UP_009_2023.
Disclosure of interest: No

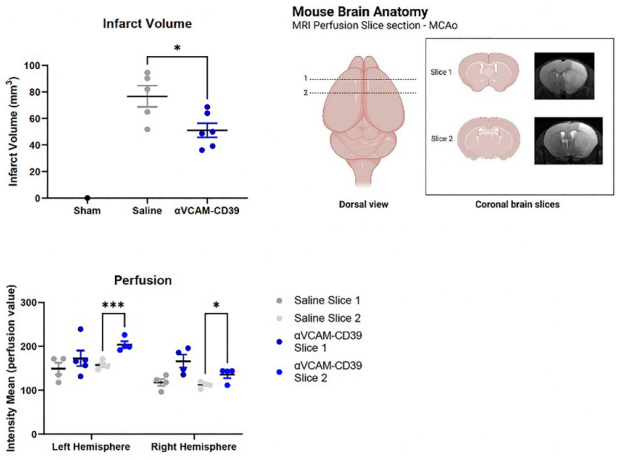

Fig. 1. Infarct volume was significantly decreased and perfusion was increased after drug treatments in MCAo treated mice (n=4-6). Infarct volume was significantly decreased after 0.5mg/kg anti-VCAM-CD39treatment compared to saline treated mice after MCAo (p=0.022, Unpaired T-test). Perfusion wassignificantly improved towards to middle of the brain after drug treatment (p=0.0448, Two-way ANOVAwith Sidaks multiple comparison test).

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

1803

Endothelial-targeted recombinant CD39 as novel therapy for focal and global brain ischaemia

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Background and aims: CD39 is an endothelial surface anchored enzyme that converts ATP and ADP to AMP, which is then subsequently converted to adenosine by CD73. We have developed an endothelial cell (EC)-targeted CD39 ('Anti-VCAM-CD39') which we demonstrate to improve stroke outcomes in murine model of acute ischaemic stroke (AIS).
Methods: Models of transient middle cerebral artery occlusion (MCAo) was used. The test drugs (anti-VCAM-CD39 and various controls were given after 3 hours after ischaemia of 30 min. Assessments at 24 h included function and, infarct volume and perfusion (MRI), albumin extravasation and serum vWF.
Results: In the MCAo model, anti-VCAM-CD39 (0.5mg/kg), demonstrated lower infarct volumes and better perfusion (Fig. 1), lower albumin extravasation and vWF level p< 0.5 for all parameters). Co-administration with tPA was synergistic in improving function and infarct volumes (p< 0.05) (Fig. 2).
Conclusions: Endothelial-targeted soluble CD39 significantly improved outcomes (function stroke volume) in focal stroke and synergized with tPA without excess bleeding.

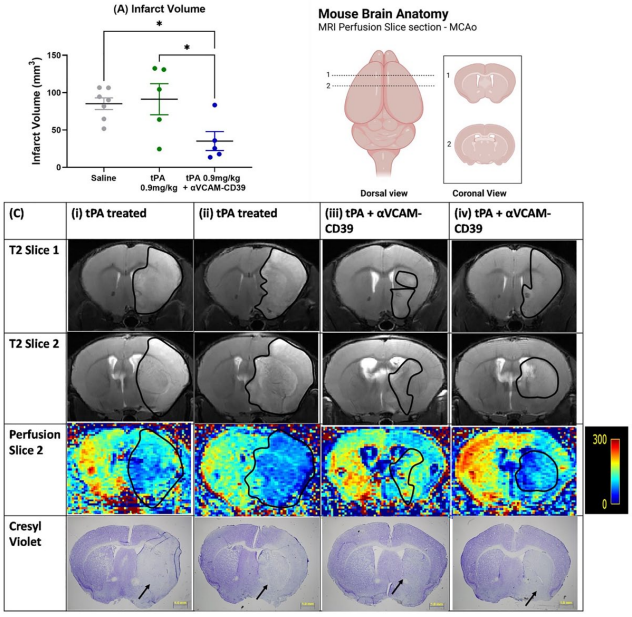

Fig. 2. As tPA is standard of care, we demonstrate that anti-VCAM-CD39 when co-administered synergised with tPA to reduce stroke volumes (N=5-8). Representative MRI volumisation is shown. There was no excess bleeding noted (data not shown).

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

1858

Characteristics of endovascular treatment for Hyperacute In-Flight Stroke

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Background and aims: Annually over 2 billion passengers fly on commercial airlines and in-flight medical emergency is different, compared to on-ground emergency. Previous reports estimated in-flight stroke up to 2 percent of total in-flight emergency. However, description of in-flight stroke case series has been limited until now. Here we report the clinical characteristics of mechanical thrombectomy of in-flight stroke cases experienced in our hospital.

Methods: Among patients registered in the prospective Inha stroke and transient ischemic attack (TIA) registry from January 2001 to October 2019, we performed retrospective review of medical records and captured ischemic stroke which occurred during flight. Routine stroke work up including brain MRI/A and etiologic investigation was performed.

Results: A total of 27 in-flight stroke cases were enrolled(Age. 60 ± 13.7 years; 16 men). The main etiology was large artery atherosclerosis(67%) and cardioembolism(22%). The time duration between stroke onset to ER arrival was 4.5± 5.3 hours. All of nine patients with unclear onset were associated with the poorer outcome, defined as mRS 4 or higher. Three persons(11%) received the intravenous thrombolysis and eight patients(30%) underwent the mechanical thrombectomy. Seven patients had successful recanalization. However, three of them became dependent and hemorrhagic conversion occurred in two patients.

Conclusions: Main etiology of ischemic in-flight stroke was a large artery atherosclerosis and cardioembolism. Unclear stroke onset during flight and delayed transportation to ER might be the barrier for early revascularization. Proper management of early stroke detection and faster transportation would be necessary for these patients.

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

1905

Early versus late initiation of endovascular therapy in patients with intracranial venous sinus thrombosis

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Background and aims: Endovascular therapy (EVT) can be performed in selected patients with intracranial venous sinus thrombosis (SVT) prone to a poor prognosis. Yet, there are uncertainties in terms of patient selection, timing of the intervention or the overall benefit. We hypothesize that an early EVT in severe SVT is associated with reduced mortality rates and an increase in the frequency of functional independence.

Methods: From our prospective single-center registry, SVT patients requiring EVT between January 2010 and October 2022 were identified. We compared patients treated within 24 hours versus more than 24 hours after admission (hospitalization to EVT; early versus late EVT). The main outcome parameter was mortality at three months. Secondary outcome parameters were excellent functional outcome (modified Rankin Scale [mRS] 0-1) and functional independence (mRS 0-2) at discharge and after 90 days.

Results: N = 177 SVT patient were identified and n = 36 (20.3%) could be analyzed (n = 24 [early EVT]; n = 12 [late EVT]). We observed a reduced mortality in early versus late EVT at three months (12.5% versus 44.4%; OR [95 % CI] 5.6 [0.81-38.79]; p = 0.068). 58.3% versus 22.2% of patients had an excellent functional outcome (mRS 0-1; 0.20 [0.03-1.36]; p = 0.118) at 90 days.

Conclusions: Early EVT was associated with a non-significant but potentially clinically relevant reduction in mortality and a trend towards a better functional outcome. Sufficiently powered randomized controlled trials need to confirm these findings and evaluate a "time is brain" concept for EVT in SVT.

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2125

STRESS HYPERGLYCEMIA AS A MODIFIABLE PREDICTOR OF FUTILE RECANALIZATION IN PATIENTS UNDERGOING ENDOVASCULAR TREATMENT FOR ACUTE ISCHEMIC STROKE

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Background and aims: EVT is the standard treatment in acute ischemic stroke (AIS) due to LVO. Despite successful reperfusion can be achieved in 80-90% of patients, approximately half of these does not reach a favourable outcome, namely futile recanalization (FR). In order to minimize FR, modifiable predictors post-recanalisation should be recognised and treated. The aim of this study was to identify modifiable and non-modifiable predictors of FR, including stress hyperglycemia.
Methods: We conducted a retrospective study of consecutive patients affected by AIS due to anterior LVO who were treated with EVT. Patients were included if achieved a TICI score of 2b or 3. Patients were distinguished into two groups, FR group (mRS $>$ 2) and meaningful recanalization (MR) group (mRS $\leqslant$ 2). Stress hyperglycemia was estimated by the GAR index (fasting plasma glucose/ HbA1c). A binary logistic regression model was used for detecting independent predictors of FR.
Results: A total of 238 subjects were included and distinguished into two groups, FR (n = 129, 54.2%) and MR (n = 109, 45.8%). Our multivariable analysis showed that age (OR 1.05; 95% CI 1.01-1.09), female sex (OR 1.43; 95% CI 1.12-5.30), GAR index (OR 1.17; 95% CI 1.06-1.29), baseline NIHSS (OR 1.15; 95% CI 1.07-1.25) and time from symptoms onset to EVT (OR 1.01; 95% CI 1.00-1.01) were significantly associated with FR.
Conclusions: In addition to age, female sex, baseline NIHSS and time from symptoms onset to EVT, we identified stress hyperglycemia as a modifiable predictor post-recanalisation of FR.
Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2221

INTRAVENOUS DOSE-ADJUSTED CANGRELOR USE FOR NEUROENDOVASCULAR PROCEDURES: AN INSTITUTIONAL EXPERIENCE

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Background and aims: This study investigates the safety and feasibility of intravenous dose-adjusted cangrelor in patients undergoing such procedures.
Methods: We conducted a retrospective study on patients who underwent neuroendovascular procedures and were placed on intravenous cangrelor. Cangrelor was administered as a 15 mcg/kg bolus followed by 2 mcg/kg/min infusion titrated to goal $P2Y_{12}$ reaction unit (PRU) level of 50 to 150, then transitioned to oral antiplatelet therapy.
Results: A total of 67 patients were included (mean age (years): 57.8 $\pm$ 18.5, males: 34 (50.7%), Black: 51 (76.1%)). The most common comorbidity was hypertension (n=38/66, 56.7%). Six patients (9.0%) received intravenous thrombolysis. Cangrelor infusion was most used for stent placement (n=21, 32.3%). Stenting occurred intracranially in 18 patients, extracranially in 22 patients, and both intracranial and carotid arteries in 3 patients. PRU levels were measured in 61 patients (91.0%). Approximately 40.9% of the patients had a favorable outcome with modified Rankin Scale (mRS) score of 0 to 2 at 90 days (n=18/44). Within 1-year, 4 patients had recurrent or new strokes (7.7%), 2 with symptomatic intracranial hemorrhage [sICH] (3.0%), 3 with asymptomatic intracranial hemorrhage [aICH] (4.5%), and 1 gastrointestinal bleeding event were recorded (1.5%). When stratified by supratherapeutic PRU level (PRU $<$ 50), there was a significant difference in sICH (p=0.044) but not aICH (p=0.203).
Conclusions: To our knowledge, this is the first report to demonstrate the safety and effectiveness of intravenous cangrelor use titrated by platelet function testing in the largest cohort of patients who underwent neuroendovascular procedures.
Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2230

Endovascular treatment of basilar artery occlusion, experience in a third level hospital

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Background and aims: Description and analysis of the experience in basilar artery occlusion endovascular treatment in a tertiary hospital with a reference population of 2.5 million inhabitants.
Methods: Patients with BAO during 2017-2021 and registered in the Andalusian thrombectomy database (ARTISTA) of Huelva-Sevilla were included. A statistical analysis of the demographic variables, recanalization rate and good functional prognosis (modified Ranking scale (eRm) $\leqslant$ 2 and $\leqslant$ 3) as well as complications of the procedure was performed.
Results: 148 patients (7.8% of the database), median 70.6 years (63-80), NIHSS pre-procedure 14 (6-24.7) 31.1% received fibrinolysis, 21.6% were awakening strokes, 12 8% were intrahospital. Time onset of symptoms-recanalization was 358 minutes (256-631), with a median recanalization puncture time of 40 (17.7-89). In 62.2% there was BA occlusion in 23.9%, and 9.9% also involving the vertebral and posterior cerebral arteries. In 61.1%, the endovascular procedure was performed with local anesthesia (general: 34%, sedation: 4.9%). Distal aspiration was performed in 82%, stent retriever in 6%, solumbra in 5%, and PTA and/or stent in 7%. The recanalization rate was TICI $\geqslant$2b in 86%. The 90-day eRm was 0-2 in 37.9% and 0-3 in 46.4%. 36.4% of the patients were Ranking 6. In 9.3% there was some procedural complication (dissection in 2.2%). Symptomatic intracranial hemorrhage occurred in 5% (PH1: 2.1%, PH2: 2.9%). 36.4% required admission to the ICU, the rest went to the Stroke-Unit.
Conclusions: Our results in the treatment of patients with OAB are similar to those described in the ATTENTION and BAOCHE studies.
Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2259

Endovascular thrombectomy in patients with anterior circulation stroke: An emulated real-world comparison

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Background and aims: Endovascular thrombectomy(EVT) is effective for acute anterior circulation stroke due to large vessel occlusion(LVO). However, translation from randomized controlled trials(RCTs) with highly selected patients to real-world requires confirmation, particularly to identify beneficial associations outside these selection criteria.

Methods: This trial emulation is based on longitudinal real-world data from the Stroke Research Consortium in Northern Bavaria(STAMINA, 2015-2019), comparing patients meeting inclusion criteria for RCTs included into HERMES and included into AURORA meta-analysis. Further, we investigated outcomes of patients treated outside of RCT-criteria. Primary outcome was functional independence at 90 days defined by modified Rankin scale(mRS,0-1). Secondary outcomes included mortality and a composite of functional recovery to independence or premorbid status.

Results: Of 598 patients, 281(47.0%) met RCT-criteria for treatment within 6h(STAMINA-HERMES), 74(12.4%) met RCT-criteria for treatment within 6–24h(STAMINA-AURORA), and 277(46.3%) patients received EVT outside RCT-criteria. We observed no difference in proportions of patients with functional independence or mortality, STAMINA-HERMES vs. HERMES meta-analysis(mRS 0-1: 120/281[43%] vs. 291/633[46%],p=0.36) and STAMINA-AURORA vs. AURORA meta-analysis(mRS 0-1: 26/74[35%] vs. 122/266[46%],p=0.10). Patients treated outside RCT-criteria had poorer outcome(mRS 0-1: 38/277[14%], $p<0.001$); possibly driven by frequent pre-existing functional dependence (n=172/277[62%]). Multivariable analysis showed independent associations of lower NIHHS($p<0.001$) and younger age(p=0.002) with functional recovery to independence or premorbid status after EVT outside RCT-criteria.

Conclusions: Translation of outcomes after EVT reported in RCTs into real-world is possible, however, almost half of patients did not met trial criteria, mainly because of preexisting functional dependence. In these patients, lower age and NIHSS was positively associated with functional outcome.

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2345

Incidence And Predictors of Early Versus Delayed Functional Independence After Late-Window Thrombectomy: Analysis of the DAWN Trial Data

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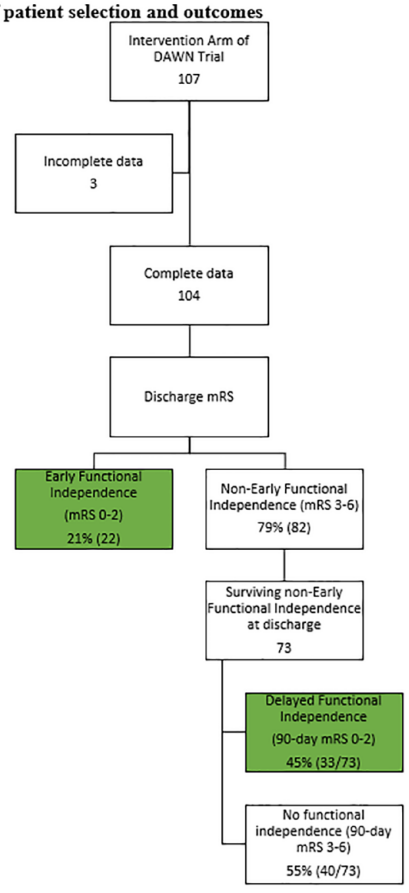
Background and aims: Success of the DAWN trial have led to a significant increase in late-window thrombectomy across the world. While chronological heterogeneity in neurological improvement after endovascular thrombectomy (EVT) has been studied for early-window thrombectomy, data for late-window thrombectomy is lacking. We aim to determine the incidence and predictors of early (EFI) and delayed functional independence (DFI) amongst intervention arm patients of the DAWN trial.

Methods: Demographic, clinical, radiological, treatment, and procedural information were analyzed from the DAWN trial (patients randomized to EVT versus medical management for anterior large vessel occlusions presenting between 6-24hours after stroke onset). Incidence and predictors of EFI (modified Rankin Scale (mRS) score 0-2 at discharge) and DFI (mRS score 0-2 at 90 days in non-EFI patients) were analyzed.

Results: Of the 104 EVT patients with available data, EFI was observed in 21% (22/104) of patients. Among surviving non-EFI patients (73),

Figure. Flow chart of patient selection and outcomes



DFI was observed in 45.2% (33/73). Amongst patients with 90-day mRS 0-2, 65% (33/51) recovered in a delayed fashion (Figure-1). Lower 24-hour-NIHSS score (OR-0.77(95%CI-0.65-0.90,p=0.001) and ICA location (OR 3.46 (95%CI-0.97-12.43,p=.057) were independent predictor of EFI. Younger age (OR-0.94(95%CI-0.88-0.99,p=0.018) and lower discharge-NIHSS score (OR-0.60(95%CI-0.46-0.77,p<0.001) were independent predictors of DFI amongst non-EFI patients. Odds of DFI (amongst surviving non-EFI) declines significantly with increasing age (approximately 7% decline for every 5 years).
Conclusions: Neurological improvement after late-window thrombectomy is chronologically heterogenous. Approximately 2 in 3 patients achieve functional independence in a delayed fashion. Younger age and lower stroke severity predict delayed functional independence.
Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2350

Endovascular thrombectomy for Acute Ischemic stroke patients 80 years and older- a single center experience

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Background and aims: Selection for endovascular treatment (EVT) for acute ischemic stroke in the elderly remains challenging due to underrepresentation in the landmark-randomized trials. The aim of this study was to assess the safety and outcome of EVT in older adults, aged ⩾80 years and compare functional outcomes with younger adults treated with EVT.
Methods: We reviewed prospectively collected data from consecutive older adults treated with EVT in our institution between 2011 and 2020. For comparison, we included a cohort of consecutive younger adults treated with EVT in 2020. Clinical and radiological parameters as well as functional, safety and technical outcomes were analyzed.
Results: Two hundred and five older adults and 113 younger adults was included in the analyses. Good function was less likely in older adults compared with younger adults (adjusted OR 0.77, 0.39-1.49, p=0.432.) Mortality rates 3 months after were comparable between groups (24.9% vs. 16.8%, p=0.09). The likelihood of achieving good functional outcome decreased by 19% for every 5 years age increase (OR 0.81 95%CI 0.73-0.90), while mortality risk increased as well (OR=1.25, 95% CI 1.1-1.5). National Institutes of Health Stroke Scale (OR 1.08, 95% CI 1.02-1.15, p=0.007) and pre-stroke modified Rankin scale (mRS) (OR 2.337, 95% CI 1.44-3.78, p=0.001) were predictors of good functional outcome.
Conclusions: EVT in older adult stroke patients is beneficial for selected cases. However, increasing age increases the risk of poor functional outcome, independent of poor prognostic factors. A pre-stroke mRS score may help clinicians in selecting older patients for EVT.
Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2422

Factors associated with early mortality in ischaemic stroke due to large vessel occlusion treated by mechanical thrombectomy with arterial recanalization after the first pass

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Background and aims: Mechanical thrombectomy (MT) is the first line treatment of ischaemic stroke due to intracranial large vessel occlusion (LVO). The fast and complete recanalization of the affected vessel is associated with improved outcomes. The first pass effect (FPE) is defined as achieving a complete recanalization with a single thrombectomy device pass. To investigate which factors are associated with early mortality in those patients in whom FPE is achieved in ischaemic stroke due to LVO in our cohort.
Methods: A prospective registry of patients with ischaemic stroke and LVO treated with TM in whom FPE was achieved. We analysed demographic, vascular, stroke-related factors, treatment received and futile recanalization (difference between baseline and 24-hour NIHSS <4 or 24-hour NIHSS of 0-1).
Results: 86 patients were included, FPE was achieved in 50% (43/86 patients). In this group hospital mortality was 16.3% (7/43 patients) compared to 18.1% (8/43) in the group where PEF was not achieved (p 0.82). Factors associated with in-hospital mortality among those patients in PEF group were: diabetes (42.9%vs8.3%, p=0.01), baseline blood glucose [165.7 (24.8)mg/dl vs 125(4.3)mg/dl, p=0.0006], systolic blood pressure [133.1 (7.9)mmHg vs 152, 2 (4.2)mmHg, p=0.06], baseline NIHSS [25(4.7) vs 14.4(1.2), p=0.003], and symptomatic haemorrhagic transformation (36 hours) 14.3% vs 0%, p=0.02.
Conclusions: FPE was achieved in 50% of patients. Factors associated with mortality in this group were diabetes, higher glycaemia and NIHSS, lower systolic blood pressure on admission and haemorrhagic transformation.
Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2447

SAFETY AND EFFICACY OF INTRAVENOUS CANGRELOR VERSUS GLYCOPROTEIN IIB/IIIA INHIBITORS IN ENDOVASCULAR TREATMENT OF TANDEM LESIONS

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Milagros Galecio-Castillo[1], Hisham Alhajala[18], Marco Malaga[1], Mudassir Farooqui[1], Tudor Jovin[12], Santiago Ortega-Gutierrez*[19], Mouhammad Jumaa[18]

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Background and aims: There is lack of evidence to support on the use of intravenous (IV) periprocedural antiplatelet therapy when patients undergo acute carotid stenting during mechanical thrombectomy (MT). We aimed to compare the safety profile of IV cangrelor versus IV glycoprotein IIb/IIIa (GP IIb/IIIa) inhibitors in patients with acute cervical tandem lesions (TLs).

Methods: We identified all cases of periprocedural administration of IV cangrelor or GP IIb/IIIa inhibitors (tirofiban, eptifibatide) during acute TLs intervention from an international multicenter collaboration. Safety outcomes included rates of sICH, parenchymal hematoma (PH2) and petechial hemorrhage.

Results: Sixty-three patients received IV antiplatelets only during EVT, 30 were in the cangrelor group and 33 in the GP IIb/IIIa inhibitors group. The dose regimen of cangrelor was a bolus of 15mcg/kg followed by an IV infusion of 2mcg/kg/min. For tirofiban, an infusion of 0.1mcg/kg/min without bolus was administered. For eptifibatide, a bolus of 90mcg/kg was followed by a 0.5-2mcg/kg/min infusion. Cangrelor demonstrated lower non-significant trends of sICH rates (3.3% vs. 12.1%,p=0.197) when compared to GP II/IIIa inhibitors. Additionally, cangrelor had a trend to lower rates of sICH-PH2 (3.3% vs. 15.2%,p=0.110) and petechial hemorrhage (20% vs. 42.4%, p=0.056). The odds of complete reperfusion (mTICI-3) were higher with cangrelor (aOR=5.86;95%CI 1.57-26.6;p=0.013).

Conclusions: Cangrelor at half dose of the myocardial infarction protocols was associated with a non-significant trend of decreased of hemorrhagic conversion and increased complete reperfusion rates compared to GP IIb/IIIa inhibitors, in patients with acute cervical TLs. Further prospective larger studies are warranted to confirm this association.

Disclosure of interest: No

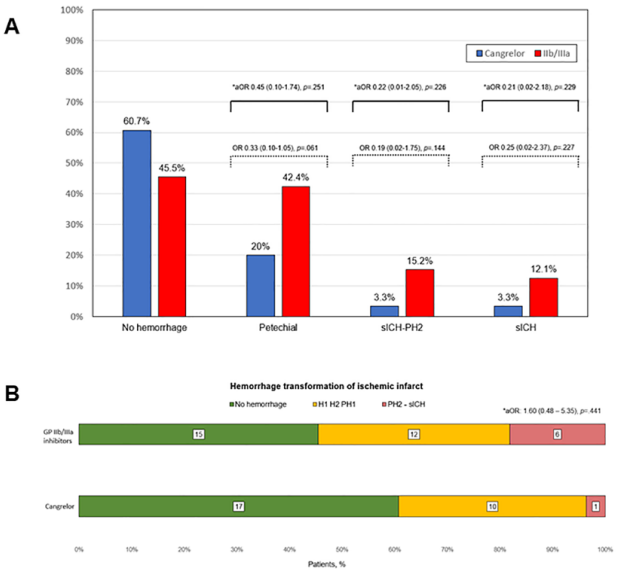

Figure . Bar chart of (A) no hemorrhage, petechial hemorrhage, sICH-PH2, and sICH in patients treated with cangrelor and glycoprotein IIb/IIIa inhibitors; and (B) shift analysis of hemorrhagic transformation according to severity. GP IIb/IIIa: Glycoprotein IIb/IIIa; aOR: Adjusted odds ratio; SICH: symptomatic intracranial hemorrhage; PH2: Parenchymal hematoma type 2.

*Adjusted for: ASPECTS, procedural heparin.

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2518

THE VARIABLE USE OF HEPARIN THROGUH IV BOLUS AND FLUSH SYSTEMS DURING EVT AMONG NEUROINTERVENTIONISTS, AN INTERNATIONAL SURVEY

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Background and aims: Heparin administered through flush fluids is not considered in recent trials and could add up to the total amount of heparin administered, possibly influencing main results. We analyze the use of heparin among neurointerventionists worldwide.

Methods: We conducted a Survey from November to January 2022. The questions aimed to identify the variability of heparin administration during EVT. We calculated the total amount of heparin(IU) entering the patient through flush fluids per hour by multiplying the number of infusion bags, drip rate[mL/h], heparin concentration[IU/L] and by 1/1000L/mL.

Results: A total of 232/4005 invited participants from >15different countries filled in the survey. 177/232 (76%) respondents administer heparin during EVT; 19/177 (11%) only through IV-bolus; 27/177 (15%) through both IV-bolus and flush-fluids and 132/177(75%) only through flush-fluids. From the participants who administer heparin through flush-fluids, the median calculated flow was 450 IU/h(IQR180-1080) with a maximum of 5400IU/h. The median concentration was 1000IU/L (IQR1000-4500) with a maximum of 10.000IU/L (n= 3[USA, Sweden and Japan]). Among the respondents who administer heparin through IV-bolus, the median was 3000(IQR80-5000)IU (for an average body-weight of 75kg), with a maximum dose of 9375IU and the most commonly used dose of 5000IU(n=8).

Conclusions: We show variable heparin doses administered by neurointerventionists worldwide through both IV-bolus and flush-fluids during EVT, with a maximum bolus dose of 9375IU (per 75kg body weight) and maximum flush-flow of 5400IU/h. Caution is warranted, especially during complex/long EVT procedures.

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2597

Practice Patterns And Utilization Of Devices And Techniques For Mechanical Thrombectomy At A Comprehensive Stroke Center

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Background and aims: Mechanical thrombectomy (MT) has transformed the treatment landscape of acute large vessel occlusion(LVO) stroke. Procedural volumes have seen robust growth over last 8 years. Manual aspiration thrombectomy(MAT) and stent-retriever-assisted MAT(SMAT) are the two commonly used MT techniques. We aim to study practice patterns and utilization of MAT versus SMAT at our comprehensive stroke center(CSC).

Methods: We performed a retrospective analysis of a prospectively maintained MT database between August2019-November2021. Clinical/procedural information (devices/technique used per thrombectomy pass) were analyzed for anterior LVO [internal carotid (ICA), middle cerebral M1 (MCA-M1) arteries] and basilar artery occlusion strokes.

Results: 110 patients were included [ICA-28%(31), MCA-M1-64%(70), Basilar-8%(9)]. Mean age was 70.4+/-15, 49% (54) were females, and median NIHSS was 17(IQR19.75-12). Mean number of passes was 2.2+/-1.6. and first pass effect was observed in 26%(29). Overall, MAT was used in 46.4%(51) and SMAT in 53.6%(59). Stent-retriever only was never used as first-pass technique. Probability of MAT declined by 7.5%/every pass(Table-1). Overall (including all passes), SMAT is more commonly used for ICA compared to MCA-M1(61% vs. 51%,p=0.35), but MAT was more commonly used for first pass for ICA when compared to MCA-M1(74% vs. 61%,p=0.21)(Table-2).Figure-1 demonstrates increasing use of MAT as the sole technique over 2.5years (33% to 49%,p=0.12)

Conclusions: At our CSC in a real-world setting, 1-in-4 patients experience First Pass Effect. Over time, the use of manual aspiration is increasing, and stent-retrievers are increasingly being used as a rescue technique for the second pass. Further studies are required to optimize mechanical thrombectomy technique.

Table-1. Manual aspiration and Stent-retriever assisted manual aspiration over each thrombectomy pass

	1st pass (n=110)	2nd pass (n=56)	3rd pass (n=30)	4th pass (n=20)	5th or more passes (n=10)	Overall
MAT	74 67.27% (74/110)	36 64.29% (36/56)	17 56.67% (17/30)	8 40% (8/20)	3 30% (3/10)	51 46.36% (51/110)
Stent-retriever only	0 0% (0/110)	4 7.14% (4/56)	1 3.33% (1/30)	2 10% (2/20)	0 0% (0/10)	0 0% (0/110)
SMAT	36 32.73% (36/110)	16 28.57% (16/56)	12 40% (12/30)	10 50% (10/20)	7 70% (7/10)	59 53.64% (59/110)

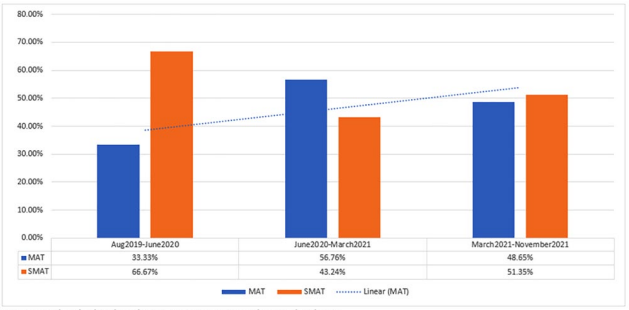
MAT=manual aspiration thrombectomy; SMAT= stent-retriever assisted MAT

Table-2. Manual aspiration and Stent-retriever assisted manual aspiration across anterior LVO location

	ICA (n=31)	MCA-M1 (n=70)	p-value
1st Pass			
MAT	23 74.19% (23/31)	43 61.43% (43/70)	0.21
SMAT	8 25.81% (8/31)	27 35.71% (27/70)	
2nd Pass	(n=23)	(n=30)	p-value
MAT	18 78.26% (18/23)	18 60% (18/30)	0.31
Stent-retriever only	1 4.35% (1/23)	2 6.67% (2/30)	
SMAT	4 17.39% (4/23)	10 33.33% (10/30)	
Overall	ICA (n=31)	MCA-M1 (n=70)	p-value
MAT	12 38.71% (12/31)	34 48.57% (34/70)	0.35
SMAT	19 61.29% (19/31)	36 51.43% (36/70)	

MAT=manual aspiration thrombectomy; SMAT=stent-retriever assisted MAT

Figure-1. Evolving technique related practice pattern over time



MAT=manual aspiration thrombectomy; SMAT= stent-retriever assisted MAT

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2605

CAROTIC ENDARTERECTOMY AS AN ALTERNATIVE TO ACUTE PLACEMENT OF CAROTIC STENT IN THE MANAGEMENT OF ACUTE ISCHEMIC STROKE CAUSED BY TANDEM LESION IN THE ANTERIOR CIRCULATION

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Background and aims: Early carotid stent reocclusion when dealing with a tandem lesion (TL) in the anterior circulation is a serious complication with significant clinical impact. Properly timed carotid endarterectomy (CEA) of the symptomatic artery can be an alternative to stent placement.

Methods: Patients who underwent mechanical thrombectomy (MT) between 2008 and 2022 for a TL followed by CEA of a symptomatic artery were included in a retrospective monocenter study. Neurological deficit was assessed with National Institutes of Health Stroke Scale (NIHSS), clinical outcome with modified Rankin scale (mRS) and achieved recanalization using the Thrombolysis in Cerebral Infarction scale (TICI).

Results: 1305 patients who underwent MT during the given period were analyzed. TL were treated in 217 patients (51% males, mean age 70.8 ± 11.1 years). In 34 patients (56% males, mean age 67.7 ± 9.8 years, mean initial NIHSS 14 points), CEA was performed after MT (94.1% with successful TICIC 2b-3 recanalization). Intravenous thrombolysis was performed on admission in 90% of these patients. Timing of the procedure was carried out according to control imaging (CT, MR DWI) and clinical condition at intervals of hours to days. A good clinical result (mRS 0-2) was achieved by 97.1% of patients. Mortality was 2.9%.

Conclusions: The main disadvantage of acute carotid stent placement is its early occlusion. Properly timed CEA can be a highly effective and safe alternative.

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Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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Establishing an in-vitro system to investigate the influence of thrombus composition on the shape of M1-Middle cerebral artery occlusion and the optimum thrombectomy strategy

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Background and aims: Achieving successful reperfusion with a single pass of a thrombectomy device, is the current procedural goal of AIS treatment for LVOs. Pre-procedural thrombus imaging characteristics are emerging as potential determinants of the most effective mechanical thrombectomy (MT) treatment strategy *in vivo*. Evaluation of proximal thrombus shape: regular or irregular of M1-Middle cerebral artery occlusion (MCAO) has suggested a potential relationship between clot phenotype and first line MT approach. We present a methodology to investigate the influence of thrombus composition on the shape of M1-MCAO and the optimum thrombectomy strategy *in-vitro*.

Methods: Platelet-contracted clot (PCC) analogues with various compositions, determined by the percentage of red blood cells (RBCs) used in clot preparation, were assembled from ovine blood. PCC analogues were cut to possess an irregular proximal face, under the assumption that all thrombi originally possess an irregular proximal face. Thrombi were introduced into a patient specific *in-vitro* model under physiological conditions. The proximal face of the thrombus was monitored from multiple angles for 15-minutes. The proximal face of the thrombus was scored as regular or irregular, as defined by Consoli *et al.*, 2018 & 2020. Thrombi were retrieved via MT techniques; contact aspiration and stent retrieval.

Results: Methodology and *in-vitro* model system have been successfully developed to investigate the influence of thrombus composition on the shape of M1-MCAO and the optimum thrombectomy strategy *in-vitro*.

Conclusions: We present the design and methodology of our study. The outlined methodology may be adapted to evaluate other factors which may influence revascularization.

Disclosure of interest: Yes

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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The Zoom RDL Radial Access System for neurointervention: An early single-center experience

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Background and aims: The transradial (TRA) approach for neurointerventional procedures is increasingly being used given its technical feasibility and safety. However, catheter trackability and device issues are reported barriers to TRA adoption.

Methods: This is the first report describing the technical feasibility and success of using the Zoom RDL Radial Access for neurointerventional procedures from October 2022 to December 2022 in a single-center institution.

Results: We included 25 cases (mean age 61.2 ± 18.2 years; 80.0% female; 60.0% Black). The most common pathologies were strokes (28.0%) and aneurysms (28.0%). The most common procedure was endovascular thrombectomy (28.0%). We used the TRA approach in 21 cases (84.0%), including distal radial/snuffbox access (36.0%). The radial diameter was greater than 2 mm for all cases who underwent the TRA approach. An intermediate catheter was used in 16 cases (64.0%). Technical access success was achieved in 23 cases (92.0%); 1 case required conversion from TRA to transfemoral approach (4.0%) and 1 case required conversion to a different guide catheter (4.0%). There were no access site complications, 1 intracerebral hemorrhage (4.0%), and 1 guide catheter-associated thrombus (4.0%).

Conclusions: The use of Zoom RDL Radial Access System is technically feasible and effective for complex neurointerventional procedures with low complication rates.

Disclosure of interest: Yes

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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ASSOCIATION BETWEEN CT PERFUSION PARAMETERS AND INTRACRANIAL HEMORRHAGE AFTER ENDOVASCULAR TREATMENT IN ACUTE ISCHEMIC STROKE: RESULTS FROM THE ESCAPE NA1 TRIAL

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Background and aims: Intracranial hemorrhage (ICH) is a complication of endovascular treatment of acute ischemic stroke. This study aimed to determine whether admission computed tomography perfusion (CTP)-derived metrics are predictive of the development of ICH at 24 hours.

Methods: Data are from the ESCAPE-NA1 trial. Patients with admission CTP, performed in clinical routine, were included. RAPID-generated relative cerebral-blood-flow (rCBF), cerebral-blood-volume (CBV), and time-to-maximum (Tmax) CTP volume maps at varying thresholds were used. The Heidelberg classification was used to categorize ICH and hemorrhage was segmented for volume calculation. Univariable/multivariable regression determined the association between various CTP parameters and ICH.

Results: 413 patients with baseline CTP were included, of whom 142 (34%) had any degree of ICH at follow-up (89 HI1/HI2 [63%], 53 PH1/PH2 [37%]). Patients with HI1/HI2 and PH1/PH2 had larger volumes of low rCBF and CBV at each threshold compared to those without any hemorrhage (e.g., HI1/HI2: rCBF<30% 15.5mL[IQR:5.9-47.7] vs. 6.1 mL[IQR:0-22.5], p<0.001 and CBV<34% 15.7[IQR:4-39.2] vs. 4.9[IQR:0-27.5], p<0.001; PH1/PH2: rCBF<30% 19.9[IQR:6.9-32.8] vs. 6.1[IQR:0-22.5], p<0.001 and CBV<34% 15.0[IQR:5.4-38.8] vs. 4.9[IQR:0-27.5], p=0.002), with no differences observed for Tmax. After adjusting for baseline/treatment variables, a graded relationship between standard-output rCBF thresholds and PH1/PH2 risk was observed (from aOR: 1.36, 95%CI:1.06-1.74 [rCBF<20%] to aOR:1.18, 95%CI:1.05-1.32 [rCBF<38%] per 10cc of core-volume). PH1/PH2 was additionally associated with greater volumes of CBV<34% (aOR:1.13, 95%CI:1.00-1.28 per 10cc core-volume). There were no associations between CTP metrics and HI1/HI2.

Conclusions: In this study, increasing rCBF volume and deficit-severity were associated with an increased likelihood of PH1/PH2 development, but not HI1/HI2.

Disclosure of interest: Yes

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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COMPARISON OF DRIP-AND-SHIP VERSUS MOTHERSHIP MODELS OF MECHANICAL THROMBECTOMY DELIVERY. ANALYSIS FROM THE IMPERIAL COLLEGE THROMBECTOMY REGISTRY

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Background and aims: It remains uncertain whether the drip-and-ship (DS) strategy (transport to the nearest primary stroke centers (PSCs)) or the mothership (MS) model (direct transportation to the Comprehensive Stroke Center (CSC)) is the organizational stroke model associated with the best functional outcome in acute stroke patients with large vessel occlusion (LVO). We compared the periprocedural complications and outcomes at 90 days of acute stroke patients with LVO of the anterior circulation directly admitted to our CSC compared to those referred from PSCs treated with mechanical thrombectomy.

Methods: This is a single-centre prospective observational study where patients with DS and MS were compared regarding the disability at 90 days, as assessed by applying the Modified Rankin Scale (mRS), the rate of successful reperfusion, and the rate of immediate complications post-procedure.

Results: Of 579 patients, 216 (37.30%) were MS, while 363 (62.7%) were DS. There was no difference regarding the modified Rankin Scale (mRS) at 3 months between MS (36.4%) and DS (39.3%) group of patients treated with mechanical thrombectomy (p=0.362). There was no significant difference regarding the NIHSS at 24h, mortality at 90 days and rate of successful recanalization post-procedure between the two groups. DS was associated with an increased risk of hemorrhagic transformation and symptomatic intracranial hemorrhage (OR, 5.414; 95% CI, 1.572-18.644; p = 0.007).

Conclusions: Our single centre study showed no difference in terms of functional independence between the DS and MS organizational paradigm. DS was associated with an increased risk of hemorrhagic transformation and symptomatic intracranial hemorrhage.

Disclosure of interest: No

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BALLOON GUIDE CATHETER USE IN ELDERLY PATIENTS TREATED WITH MECHANICAL THROMBECTOMY: INSIGHTS FROM THE ROSSETTI REGISTRY

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Background and aims: The efficacy of the balloon guide catheter (BGC) in patients with anterior circulation large vessel occlusion (LVO) has been widely demonstrated in non-randomized studies. However, its impact in elderly population has been poorly reported. We aimed to analyze the effect of BGC in a cohort of elderly patients (age ⩾80 years) with anterior circulation LVO.

Methods: Consecutive patients from 2019 to 2022 were collected from ROSSETTI Registry. Demographic, clinical data, angiographic endovascular technique and clinical outcome were compared between BGC and non-BGC groups. We studied the association between BGC and the rate of complete recanalization after single first pass effect (modified Thrombolysis in Cerebral Infarction (mTICI) 2c-3), as well as its association with functional independence at 3 months (presence of modified Rankin scale of 0-2).

Results: 808 patients were included, of them 465 (57.5%) were treated with BGC. Patients treated with BGC were older, presented more severe neurological symptoms at admission, lower baseline ASPECTS and were less likely to receive endovenous fibronolytics. No differences were observed in terms of modified first pass effect (mFPE) between groups (45.8 vs. 39.9%, p=0.096), although final mTICI 2c-3 was significantly higher in BGC group (77.4% vs. 66.2%, p<0.001). In the multivariable regression, BGC use was not independently associated with mFPE or final mTICI 2c-3. No differences in functional outcome were observed at 3 months.

Conclusions: In our study, BGC use was not a predictor of first pass effect or near-complete recanalization. Further studies are needed to confirm these findings.

Figure 1. Distribution of mRS at 3 months according to BGC vs. non-BGC use.

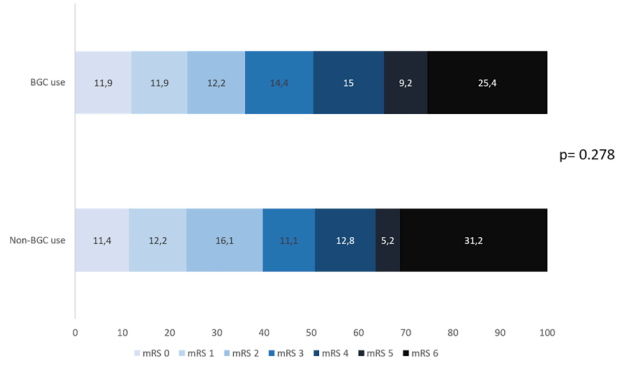
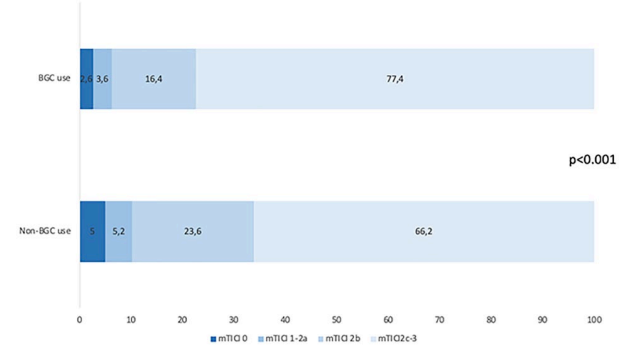


Figure 2. Final recanalization rates according to BGC vs. Non-BGC use



Disclosure of interest: No

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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Statin treatment in stroke patients with low-density lipoprotein cholesterol levels below 70 mg/dl

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Background and aims: It is unclear whether statin treatment could reduce the risk of early vascular events when baseline LDL-C levels are already very low at <70mg/dl at the time of the index stroke.
Methods: This was a retrospective study of a prospective, multicenter registry of consecutive patients with first ever acute ischemic stroke with baseline LDL-C <70mg/dl and without statin pretreatment. A propensity score weighting method was applied to control for baseline imbalances. The primary outcome was a composite of stroke, myocardial infarction, and all-cause mortality within 3 months.
Results: A total of 2850 patients (age, 69.5±13.4; male, 63.5%) were analyzed for this study. In-hospital statin treatment was used for 74.2% of patients. The primary composite outcome within 3 months occurred in 21.5% of patients in non-statin group and 6.7% of patients in the statin group (P <0.001), but the rates of stroke (2.65% vs. 2.33%), hemorrhagic stroke (0.16% vs. 0.10%), and MI (0.73% vs. 0.19%) were not significantly different between 2 groups. After IPTW analysis, the primary composite outcome was significantly reduced in patients with statin therapy (weighted HR 0.54 [0.42-0.69]). However, statin treatment did not increase the risk of hemorrhagic stroke (weighted HR 1.11 [0.10-12.28]).
Conclusions: Approximately three-quarters of the patients with first-ever ischemic stroke with baseline LDL-C levels <70 mg/dl received in-hospital statin treatment. Statin treatment, compared with no statin treatment, was significantly associated with a reduced risk of the 3-month composite of stroke, MI, and all-cause mortality, but not an increased risk of hemorrhagic stroke.
Disclosure of interest: No

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TREATMENT STRATEGIES AND PROGNOSIS FOR MODERATE STROKE PATIENTS IN CHINA

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Background and aims: We aimed to explore the effectiveness of mono- vs. dual-antiplatelet (DAPT) treatment strategies against subsequent stroke for moderate stroke patients with NIHSS 4–10 in a nationwide cohort.
Methods: Data were derived from the Third China National Stroke Registry (CNSR-III). In this prospective nationwide cohort, moderate ischemic stroke patients with NIHSS 4–10 and without intravenous thrombolysis or endovascular treatment were included and categorized into mono- or dual-antiplatelet groups. The outcomess were stroke recurrence and all-cause mortality at 3 months and 1 year, respectively. Cox proportional-hazards models were utilized to investigate the association of treatment strategies and prognosis.
Results: Of a total of 2 414 patients enrolled in the study, 1 633 (67.6%) received clopidogrel or aspirin and 781 (32.4%) received DAPT. Recurrent stroke occurred in 108 (6.6%) patients of the mono-antiplatelt group and 40 (5.1%) patients of the DAPT group (aHR 0.73, 95% CI 0.47-1.13, P=0.16) at 3 months, and the rate of stroke recurrence was 10.7% in the mono-antiplatelet group and 8.6% in the DAPT group (aHR 0.81, 95% CI 0.58-1.13, P=0.22) at 12 months. The antiplatelet paradigm was not significantly associated with death at 3 months but DAPT significantly reduced the mortality at 12 months (2.3% vs 1.0%, aHR 0.41, 95% CI 0.17-0.98, P=0.046).
Conclusions: In moderate stroke patients presenting within 24 hours of symptom onset, the addition of clopidogrel 75 mg to aspirin might not be associated with lower risk of recurrent stroke than aspirin or clopidogrel alone.
Disclosure of interest: No

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ISCHAEMIC STROKE IN PATIENTS ON ANTIPLATELET THERAPY – CAUSES AND OUTCOMES

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Background and aims: Acute ischaemic stroke (AIS) may occur despite antiplatelet therapy (APT). We aimed to investigate frequency, potential causes and outcomes in patients with AIS despite APT

Methods: We analysed patients with AIS from the Swiss Stroke Registry between January 2014 and September 2022. We determined the frequency of APT at stroke onset, assessed stroke aetiology (TOAST classification) and determined the association of prior APT with unfavourable functional outcome (modified Rankin Scale score 3-6) and recurrent ischaemic stroke at 3 months using regression models.

Results: Among 53'352 patients, 27'484 (51.5%) had no prior antithrombotic treatment. 17'760 (33.3%) were on APT and 7'039 (15.2%) on anticoagulation (figure). In patients with a history of ischaemic stroke/TIA (n=11'948; 22.4%), 2'401 (20.1%) had no prior antithrombotic therapy, 6'594 (55.2%) were on APT and 2'489 (24.7%) on anticoagulation. Amongst patients with AIS despite APT, aetiology was large artery atherosclerosis in 19.8% (n=3'416), cardiac embolism in 23.6% (n=4'059), small vessel disease in 11.7% (n=2'011), other causes in 7.4% (n=1'267), more than one cause in 6.3% (n=1'078) and unknown causes in 31.3% (n=5'388).

Prior APT was not independently associated with unfavourable outcome (aOR=1.06;95%CI:0.98-1.14;p=0.135) or death (aOR=1.04;95%CI:0.92-1.17;p=0.550) at 3-months follow-up but with increased odds of recurrent stroke (3.6% (n=457) vs. 2.1% (n=432); aOR=1.46;95%CI:1.23-1.74; p<0.001).

Conclusions: Approximately one third of AIS occurred despite APT and the aetiology is heterogeneous. About 20% of patients with a history of ischaemic stroke had no antithrombotic therapy when having a recurrent AIS. There is need and potential for optimising secondary prophylaxis.

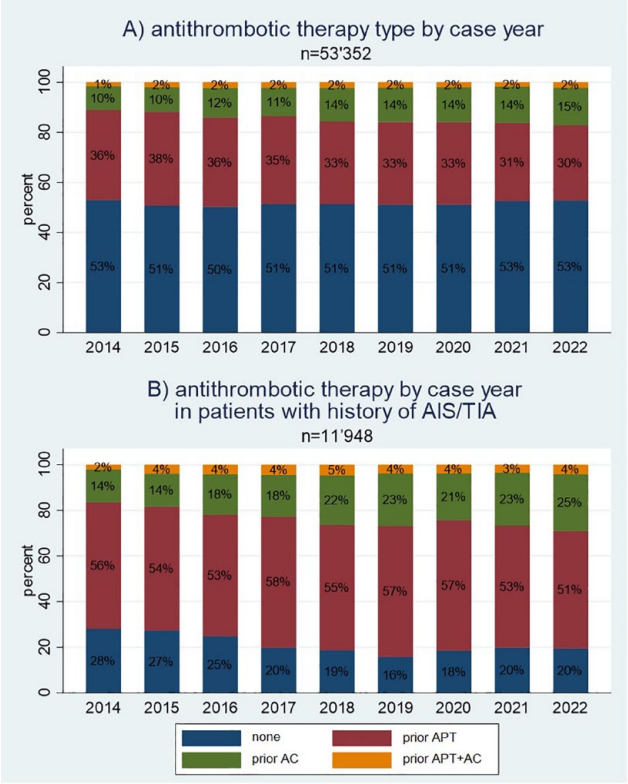

Figure 1: Antithrombotic therapy by case year in the overall population [A] and in patients with history of acute ischemic stroke (AIS) or transient ischaemic attack (TIA) [B]. AC: anticoagulation; APT: antiplatelet therapy

Disclosure of interest: No

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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POSSIBLE MRI PREDICTORS OF HEMORRHAGIC TRANSFORMATION IN ACUTE STROKE PATIENTS UNDERGOING DAPT: A MONOCENTRIC CLINICAL STUDY

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Background and aims: Dual antiplatelet therapy (DAPT) is a stroke secondary prevention treatment, indicated in different clinical scenarios. However, the safety of DAPT and its predictors aren't well known. The aim of this study was to identify predictors of hemorrhagic transformation (HT), analyzing MRI features, to better select patients for DAPT.

Methods: We enrolled acute ischemic stroke patients, admitted to Stroke Unit between 2019 and 2021, who were started DAPT with ASA and Clopidogrel for any indications, within 96 hours, according to current guidelines. We collected biographical and clinical data as well as neuroradiological features in MRI performed at the time of DAPT introduction, namely lesion volume according to ABC/2 method. The primary outcome was safety, defined as the absence of HT at control CT, executed 7 days after DAPT beginning.

Results: We enrolled 184 patients (mean age 70, 65% men). Out of them, 24 patients presented HT. A larger lesion volume on MRI was the best predictor of HT risk ($p<0.01$). We identified a cut-off volume of 8,16 ml (AUC 0.87, Sensitivity 0.8; Specificity 0.85). Lesion volume >8,16 ml was associated with a 12.35-fold increased risk of HT (95% CI 3.62-42.08, $p<0.001$). In addition, for patients with ⩾ 2 MRI acute lesions, we observed a higher frequency of HT (p=0.02).
Conclusions: MRI stroke volume cut-off is the best predictors for HT in acute ischemic stroke patients undergoing DAPT. For patients with stroke volume >8.16 ml, at higher risk of HT, strict clinical and radiological monitoring could be warranted.
Disclosure of interest: No

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MEDICATION CLASS AFFECTS COMPLIANCE IN ISCHEMIC STROKE PATIENTS

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Background and aims: Recurrent strokes are associated with greater disability and mortality than first-time strokes. However, adherence to secondary stroke prevention medications has been reported to be suboptimal. We assessed medication adherence to antihypertensives, antiplatelets, and statins after acute ischemic stroke and identified factors associated with non-adherence to each drug class.
Methods: This study is an extension of a larger prospective cohort study of ischemic stroke patients assessed at an outpatient post stroke clinic. Medication adherence was determined by direct questioning and medication knowledge were via the Beliefs about Medicines Questionnaire. Factors associated with non-adherence in each drug class were determined using logistic regression.
Results: Rates of adherence differed between antihypertensives (77.9%), antiplatelets (80.3%), and statins (64.7%) ($p<0.001$). Under multivariate analyses, non-adherence to antihypertensives was significantly associated with living alone (p=0.042), taking <5 medications (p=0.009), and stronger beliefs that medications are harmful (p=0.002). For antiplatelets, non-diabetic patients (p=0.016) and patients with stronger beliefs that medications are harmful (p=0.001) were more likely to be non-adherent. Patients non-adherent to statins were more likely to have a longer time since ischemic event (p=0.013) and have a transient ischemic attack as the index event (p=0.016).
Conclusions: Overall, medication adherence behaviour to secondary stroke prevention medications was poor, with statins the least adhered to. Factors associated with non-adherence to each drug class could guide the development of tailored interventions to improve adherence to secondary stroke prevention medications.
Disclosure of interest: No

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EARLY STATIN DE-ESCALATION AND CARDIOVASCULAR EVENTS IN PATIENTS WITH ACUTE ISCHEMIC STROKE

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Background and aims: Although post-stroke high-intensity statin therapy is known to benefit patients with ischemic stroke by reducing subsequent vascular events, the optimal duration of high-intensity statin therapy is not well defined. This study investigated the effect of early modification of statin intensity on cardiovascular outcomes in patients who received high-intensity statin therapy after stroke.
Methods: We assessed patients who received high-intensity statin therapy after acute ischemic stroke. Early statin de-escalation was defined as adjustment of statin intensity from high to low-to-moderate within 90days after stroke onset. We investigated the association between early statin de-escalation and major adverse cardiovascular events (MACE), defined as a composite of recurrent stroke, myocardial infarction, and vascular death during a 1-year follow-up period.
Results: A total of 2857 patients (mean age 66.3±13.0 years; 64.9% male; 52.2% with atherosclerotic stroke) were included. Statin intensity was de-escalated within 90days after stroke onset in 363 (12.7%) patients. Patients in early statin de-escalation group were older, had severe stroke symptom at onset, and were more dependent on others at discharge. Early statin de-escalation was associated with a higher risk of MACE (aHR 1.79 [95% CI, 1.19–2.70]) when compared with no or late statin intensity adjustment. The early statin de-escalation group was less likely to achieve target low-density lipoprotein cholesterol (LDL-C) on follow-up laboratory testing (aOR 0.66 [95% CI, 0.51–0.86]).
Conclusions: In patients with acute ischemic stroke, statin de-escalation within 90days after onset was associated with higher risk of MACE and uncontrolled follow-up LDL-C.
Disclosure of interest: No

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

1468

Risk of drug-drug interaction of levetiracetam and apixaban

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Background and aims: Symptomatic epilepsy is a common complication of cardioembolic stroke and levetiracetam is among the preferred anticonvulsant drugs for these patients. Levetiracetam induces the permeability glycoprotein efflux transporter protein system and thereby bears a relevant risk of drug-drug-interactions. Animal models predict a reduction in the efficacy of Direct Oral Anticoagulants among patients on levetiracetam comedication, while the results from earlier clinical studies are inconclusive.
Methods: In this retrospective cohort study, we included patients on apixaban, who were admitted to our neurovascular center between 2016 and 2020 and had received therapeutic drug monitoring for Apixaban during steady state. The concomitant use of levetiracetam was assessed from the patient records. Functional outcome was collected after three months.
Results: 280 patients were included and 30 patients had a concomitant use of levetiracetam. Patients on levetiracetam had a worse functional status prior to admission than patients without. The apixaban plasma trough levels were similar between both groups (102 (72 – 143) ng/ml vs. 94 (64 – 124)) and the apixaban peak levels were lower (193 (132 – 257) ng/ml vs. 169 (94 – 210) ng/ml, p=0.027) in patients on levetiracetam. 2 of 6 patients with recurrent ischemic stroke within 3 months used levetiracetam.

Conclusions: The similar plasma trough levels argue against a clinically relevant drug-drug interaction. Further research is warranted to reconfirm the differences seen in plasma peak levels.

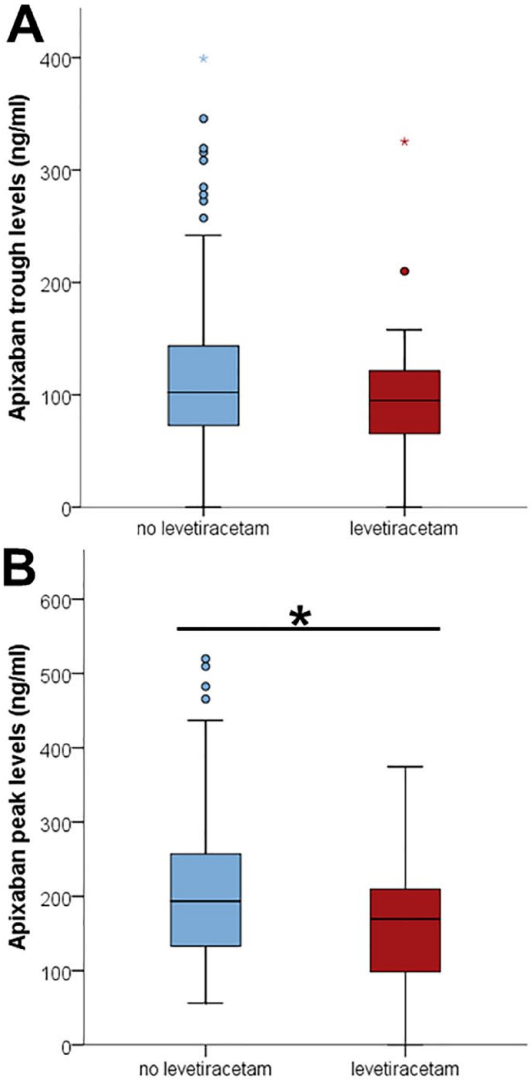

Fig. 1. Patients with comedication with levetiracetam show (A) no difference in Apixaban trough levels (p=0.229), (B) reduced Apixaban peak levels (p= 0.027). *: p<0.05

Disclosure of interest: No

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

1557

RELATION OF PHYSICAL INACTIVITY AND OBESITY WITH CARDIOMETABOLIC MULTIMORBIDITY: A NATIONALLY REPRESENTATIVE POPULATION-BASED COHORT STUDY

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Background and aims: Cardiometabolic multimorbidity is associated with adverse health outcomes. Physical inactivity and obesity are associated with poor health and psychological well-being. The aim of this study is to identify the longitudinal associations of physical inactivity, overweight and obesity on the development and worsening of cardiometabolic multimorbidity over time.
Methods: Using nationally-representative data from the China Health and Retirement Longitudinal Study, we analyzed 17,708 participants ⩾45 years with and without cardiometabolic multimorbidity. The development of Cardiometabolic multimorbidity was measured as the accrual of additional conditions over an 8-year period. Poisson-distributed Generalized Linear Models (GLM) were used to estimate the association of cardiometabolic multimorbidity with physical inactivity, overweight and obesity.
Results: 22.48% of included participants had cardiometabolic multimorbidity at baseline and 35.28% at follow-up. 4,102 of 9,927 (41.32%) participants without multimorbidity and 819 of 2,879 (28.45%) with existing multimorbidity developed new condition/s. Physical inactivity was significantly associated with cardiometabolic multimorbidity (relative risk [RR]=1.254, confidence interval [CI]: 1.136-1.385), complex multimorbidity (RR=1.614, CI: 1.348 1.933), and worsened multimorbidity (RR=1.214, CI: 1.032-1.427). Being overweight & obesity was also significantly associated with cardiometabolic multimorbidity (RR=1.705, CI: 1.574-1.846), and complex multimorbidity (RR=2.156, CI: 1.852-2.510), and worsened multimorbidity (RR=1.385, CI: 1.217-1.576).
Conclusions: Physical inactivity, overweight and obesity are associated with the development and worsening of cardiometabolic multimorbidity over time. They support the recent National Institute for Health & Care Excellence (NICE) Guidance on multimorbidity which suggests that patients with multimorbidity should be identified and targeted for interventions to improve health outcomes.
Disclosure of interest: No

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

1781

Impact of levetiracetam on clinical outcomes among elderly atrial fibrillation patients under direct oral anticoagulant therapy

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Background and aims: Levetiracetam is a P-glycoprotein inducer and theoretically causes reduced direct oral anticoagulant (DOAC) exposure. The study aims to investigate the impact of levetiracetam on DOAC concentration and clinical outcomes among elderly patients with atrial fibrillation (AF).
Methods: This retrospective investigation was conducted in a tertiary hospital in Taiwan. AF patients aged ⩾65 years and used DOAC for ⩾3 days were enrolled and classified into levetiracetam users or non-users according to the exposure status. DOAC concentration was measured among a subset of patients. The primary outcome was IS or transient ischemic attack (TIA). The secondary outcome was the major bleeding.
Results: During 2012 to 2019, we enrolled 365 levetiracetam users and 1460 non-users. IS or TIA occurred in 22 users (23.3 per 100-person-years)

in contrast to 174 non-users (20.8 per 100-person-years, log-rank p=0.09). After adjustment, levetiracetam was not associated with IS or TIA (HR=1.04 [0.66, 1.64]). Major bleeding occurred in 3 users (2.66 per 100-person-years) in contrast to 3 non-users (0.22 per 100-person-years, log-rank p=0.01). After adjustment, the impact of levetiracetam was significant (HR=5.52 [1.09, 28.07]). DOAC concentration was available in 19 users and 55 non-users. The proportion of patients with high DOAC concentration was 15.8% in users and 3.6% in non-user groups (P=0.10). After adjustment, levetiracetam predicted high DOAC concentration (OR=23.23 [1.27, 426.71]).
Conclusions: Among elderly AF patients treated with DOAC, levetiracetam does not increase risk of IS or TIA. However, levetiracetam seems to increase the risk of high DOAC concentration and major bleeding.
Disclosure of interest: No

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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PRESCRIBING TRENDS OF SECONDARY PREVENTION MEDICATIONS AFTER ISCHAEMIC STROKE AND MORTALITY OUTCOMES IN A SCOTTISH COHORT: A NATIONAL DATABASE STUDY

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Background and aims: The number of people with stroke in Scotland is rising due to the ageing population and improving stroke survival rates. Secondary prevention aims to reduce morbidity, mortality, and other complications related to stroke. This study examined the association between medications used in secondary prevention and stroke outcomes.
Methods: This is a population-based study of first-ever ischaemic stroke patients in the Scottish Stroke Care Audit between July 1, 2010, and June 30, 2015, linked with community prescribing data (Prescribing Information System), hospital admissions and discharge data (Scottish Morbidity Record 01) along with mortality data (National Records of Scotland). Logistic regression and cox proportional-hazards models were developed to describe variable associations.
Results: There were 25 684 ischaemic stroke patients with a mean age of 70.8 (±13.5) years and 49.4% were women. Antithrombotics were prescribed to 24 216 (94.3%) patients, antihypertensives to 19 446 (75.7%) and statins to 22 117 (86.1%). Within six months after ischaemic stroke, women, and younger patients (<65 years) had lower odds of receiving secondary prevention. Patients living in less deprived areas were less likely to receive antiplatelets and more likely to be anticoagulated. Discontinuing secondary prevention medications after stroke was associated with worse longer-term mortality in stroke survivors, while continuing or starting statins, and oral anticoagulants in patients with atrial fibrillation, were associated with better survival.
Conclusions: This study highlights the prescribing patterns of secondary prevention medications in the Scottish stroke population and the benefits of starting or continuing some therapies in reducing all-cause mortality.
Disclosure of interest: No

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2034

Effect of ABCB1 and CES1 gene polymorphisms on the minimum plasma concentration of dabigatran and clinical outcome of treated patients

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Background and aims: Dabigatran is a direct thrombin inhibitor used to prevent stroke in atrial fibrillation. The prodrug dabigatran etexilate is a substrate for enteral P-glycoprotein (ABCB1) and is subsequently activated by hepatic and intestinal carboxylesterases (CES1 gene) to form active metabolites. Genetically determined variability in dabigatran metabolism may influence concentration. We tested the effect of polymorphisms of CES1 (rs2244613) and ABCB1(rs4148738) genes on the minimal plasma level (C□i□) of dabigatran in correlation with clinical outcomes.
Methods: Retrospective multicentric study of consecutive patients on dabigatran therapy. Examination of CES1 rs2244613 and ABCB1 rs4148738 polymorphisms, C□i□ 12 hours after administration, clinical follow-up (ischemic stroke, major bleeding, myocardial infarction, other thromboembolism, death).
Results: A total of 427 patients treated for a mean of 17 months (SD 18.2), 240 (56.2%) of whom were men, mean age 67.5 years (SD 14.7, 18-96). The ABCB1 variant genotype was present in 68.1% of patients. The resulting differences in C□i□of dabigatran for this polymorphism were not statistically significant. The CES1 variant was present in 161 of patients (37.7%). The C□i□of dabigatran was significantly lower in patients with the variant polymorphism vs. wild type (C□i□ 95.5 vs 82.8ng/ml, p=0.04).There was no statistically higher risk of complications in variant genotype patients.
Conclusions: We demonstrated a significantly reduced C□i□of dabigatran in carriers of the CES1 variant genotype rs2244613. The ABCB1 rs4148738 polymorphism did not have a significant effect on drug levels in our cohort.
Disclosure of interest: No

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2057

Empiric ticagrelor and aspirin is the most cost effective treatment approach in minor stroke and transient ischemic attacks

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Background and aims: Patients with minor ischemic stroke or transient ischemic attacks (TIAs) are often treated with clopidogrel as part of dual antiplatelet therapy as part of secondary stroke prevention. Patients with loss of function (LOF) mutations in the CYP2C19 gene are at risk for poorer secondary outcomes when prescribed clopidogrel. We aimed to

determine the cost effectiveness of different treatment strategies in patients with minor strokes or TIA.
Methods: Markov models were developed to look at the cost effectiveness of empiric treatment with aspirin and clopidogrel (base model) versus empiric treatment with aspirin and ticagrelor (model A), versus genotype guided therapy (model B). Effect ratios were obtained from the literature and incidence rates and costs were obtained from the national data published by the Singapore Ministry of Health. Lifetime costs and QALYs were calculated. The primary endpoints were the incremental cost-effectiveness ratios (ICERs).
Results: The prevalence of the LOF mutations were 61% in the population, with 65% of ethnic Chinese, 60% of ethnic Indian, and 53% of ethnic Malay patients having LOF mutations. Based on this prevalence, the overall ICER of model A as compared to the base model was SGD $6,992, the ICER of model B compared to the base model is SGD $ 1,952, and the ICER of model B when compared to model C is SGD $42,744.
Conclusions: This study suggests that in Asian ischemic stroke patients with minor strokes or TIAs, empiric treatment with aspirin and ticagrelor is the most cost effective approach
Disclosure of interest: No

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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DEVELOPMENT AND EFFECT OF A COORDINATED COMMUNITY HEALTH WORKER (CHW) INTERVENTION (C-CHW-I) MODEL FOR THE STROKE SURVIVORS IN KERALA, SOUTH INDIA

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Background and aims: There are very few structured models for medication-adherence and risk factor monitoring for stroke survivors in the community, even though data suggests that risk factor monitoring and control is effective in preventing recurrent strokes. The aim was to develop and evaluate a coordinated care model in stroke for medication-adherence and risk factor monitoring.
Methods: We developed a multimodal Coordinated CHW (Community Health Worker) Intervention(C-CHW-I) model involving training of the CHW and physicians, installation of open data tool and health education of the stroke survivors. This included minimum of three CHW home visits, telephone calls, risk factor management and health education materials. The study assessed the effect of this model on medication-adherence and change in frequency of risk factor monitoring.
Results: From 16 health blocks of the Kollam district, Kerala, 896 stroke survivors were enrolled by the CHW. The mean age was 64±12 years,765(85%) had ischemic stroke,755(84.3%) had hypertension and 447(49.9%) had diabetes. After CHW intervention, the mean medication-adherence scores improved from 3.5 to 3.8 at 6 months and tobacco users decreased from 7% to 2%. Monitoring of blood sugar significantly improved from 43% to 50%; while there is no significant change in monitoring of lipid profile at 6 months. Mean systolic BP, improved significantly from 138±21mmHg to 132±15mmHg [mean difference [5.1(95% CI; 3.1 to 7.1)]at 6th months.
Conclusions: This C-CHW-I model improved medication-adherence, risk factor monitoring and lifestyle modification. A community intervention through CHW will be a good model for secondary prevention of stroke.
Disclosure of interest: No

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

2511

ELIGIBILITY FOR UPCOMING LIPOPROTEIN(A)-LOWERING THERAPIES OF PARTICIPANTS IN THE STROKE CARD TRIAL

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Background and aims: Elevated lipoprotein(a) is a known risk factor for developing atherosclerotic cardiovascular events such as ischemic stroke. Pelacarsen (Apo(a) antisense oligonucleotide) or Olpasiran (Apo(a) siRNA) are safe and effective in lowering lipoprotein(a) and offer a novel secondary preventive strategy after stroke / TIA. Yet, it is unknown how many stroke patients would qualify for these therapies.
Methods: We analysed data of the STROKE-CARD trial (NCT02156778), a randomised controlled trial of a disease management program in patients with ischaemic stroke or TIA. Among patients with lipoprotein(a) measurements available at baseline (n=1625), we calculated the proportion and exact 95% confidence intervals (CI) of patients eligible for lipoprotein(a)-reduction therapies based on published eligibility criteria of ongoing phase-3 trials (NCT04023552, NCT05581303). We used a factor of 2.4 to convert lipoprotein(a) values from nmol/L to mg/dL.
Results: Following eligibility criteria of NCT05581303, 72 patients (4.4%) had a lipoprotein(a) value ⩾200 nmol/L; 1515 (93.2%) were aged 18-85 years. Applying all inclusion and exclusion criteria, 13 patients remained eligible for such a trial, corresponding to 0.80% (95% CI 0.43-1.36%) of our study population. Following eligibility criteria of NCT04023552, 120 patients (7.4%) had a lipoprotein(a) value ⩾70 mg/dL 1316 (81.0%) were aged 18-80 years. Applying all stated criteria, 47 patients remained eligible for such a trial, corresponding to 2.89% (95% CI 2.13-3.83%) of our study population.
Conclusions: Applying narrow eligibility criteria of phase-3 trials, only a small fraction of ischaemic stroke and TIA patients would be able to receive secondary prevention using lipoprotein(a)-lowering therapies.
Disclosure of interest: No

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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Efficacy and Safety of Oral Factor XIa Inhibitors in Stroke Prevention: a systematic review and meta-analysis

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Background and aims: Despite preventive measures, stroke rates remain high in the primary and in the secondary prevention setting. Factor-XIa inhibition may offer a novel, safe and effective antithrombotic option for stroke prevention.
Methods: We conducted a systematic review and meta-analysis including all available randomized-controlled clinical trials (RCTs) that investigated efficacy and safety of factor-XIa inhibitors versus controls in either primary or secondary stroke prevention settings. The primary efficacy and safety outcomes of interest were symptomatic ischemic stroke (IS) and the composite of major bleeding and clinically relevant non-major bleeding.
Results: Four, phase-II, dose-finding RCTs were included comprising a total of 4,732 patients treated with factor-XIa inhibitors versus 1,798 controls. Treatment with factor-XIa inhibitors did not reduce the risk of IS compared to controls (RR:0.89;95%CI:0.67-1.17). The composite of symptomatic IS and covert infarcts on brain MRI (RR:1.01;95%CI:0.87-1.18), the composite of symptomatic IS and transient ischemic attack (TIA; RR:0.78;95%CI:0.61-1.01), and the composite of major adverse cardiovascular events (RR:1.07;95%CI:0.87-1.31) did not differ between the treatment groups. Treatment with factor-XIa inhibitors did not increase the risk of the composite of major bleeding and clinically relevant non-major bleeding (RR:1.19;95%CI:0.65-2.16), major bleeding alone (RR:1.19;95%CI:0.64-2.22), intracranial bleeding (RR:0.91;95%CI:0.26-3.19) or all-cause mortality (RR:1.21;95%CI:0.77-1.90).
Conclusions: This meta-analysis provides reassuring evidence regarding the safety of factor-XIa inhibitors for stroke prevention. This finding coupled with potential signals of efficacy in reducing IS (and TIA) underscore the importance of embarking on phase-III RCTs to provide more robust data regarding the effect of factor XIa inhibition on stroke prevention.
Disclosure of interest: Yes

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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ROLE OF PLAQUE INFLAMMATION IN SYMPTOMATIC CAROTID ARTERY STENOSIS

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Background and aims: Plaque inflammation on FDG-PET and the symptomatic carotid atheroma inflammation lumen-stenosis (SCAIL) score have been associated with recurrent ischemic events. We aimed to validate these findings on our Asian cohort.
Methods: Our single-center prospective cohort study recruited patients with recent TIA or ischemic stroke within the past 30 days, ipsilateral carotid artery stenosis of 50% or more, and those who were not considered for early carotid revascularization. The maximum standardized uptake value (SUVmax) of the symptomatic carotid plaque, SCAIL score, and stenosis severity of the symptomatic carotid artery were measured. The outcomes were 90-day ipsilateral ischemic stroke and 90-day ipsilateral symptomatic TIA or major adverse cardiovascular event (MACE).
Results: Of 131 included patients, 14 (10.7%) patients had a 90-day stroke, and 41 (31.3%) patients had a 90-day TIA or MACE. SCAIL score (AUC=0.79; 95% CI=0.65, 0.92) was superior to symptomatic plaque SUVmax (AUC=0.92; 95% CI=0.82, 1.00) in predicting
90- day ipsilateral ischemic stroke. However, symptomatic plaque SUVmax (AUC=0.84; 95% CI=0.76, 0.92) was superior to the SCAIL score (AUC=0.76; 95% CI=0.66, 0.85) in predicting 90-day TIA or MACE.
Conclusions: Plaque inflammation as quantified on FDG-PET may serve as a reliable biomarker for risk stratification among patients with recently symptomatic carotid artery stenosis. Future studies are recommended to evaluate whether significant plaque inflammation on FDG-PET could help in better patient selection for carotid revascularization and/or anti-inflammatory therapy.
Disclosure of interest: Yes

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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Long-term Risk of Bleeding Events in Patients Taking Antithrombotic Agents for Cerebrovascular or Cardiovascular Diseases

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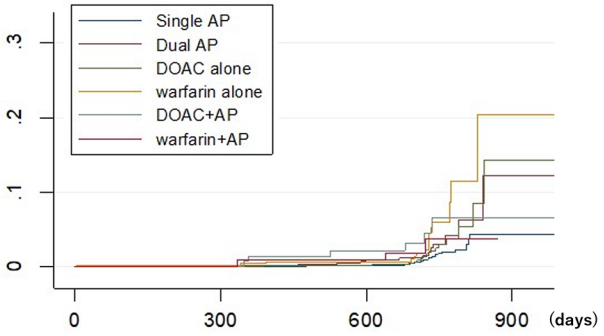
Background and aims: To clarify the risk of bleeding events of patients taking anthithrombotic agents for cerebrovascular and cardiovascular diseases in recent clinical setting.
Methods: A prospective, multicenter, observational study followed bleeding and ischemic events for up to 2 years in patients with cerebrovascular and cardiovascular diseases. The primary outcome was major bleeding, and the secondary outcomes included clinically relevant non-major bleeding.
Results: Of the 5,250 patients enrolled, 3,134 (70±11 years in age, female 34.4%, HASBLED≥3 32.8%) were treated with single antiplatelet agents (AP) alone, 551 (71±11 years, 25.8%, 40.8%, respectively) with dual AP alone, 870 (75±10 years, 37.1%, 39.8%, respectively) with direct oral anticoagulant alone (DOAC), 432 (72±12 years, 34.3%, 41.4%, respectively) with warfarin alone, 143 (76±8 years, 16.8%, 42.7%,

respectively) with DOAC+ AP, and 120 (73±12 years, 18.3%, 47.5%, respectively) with warfarin+AP. Compared to the single AP group (37 events, 0.62%), dual AP(13 events, 1.23%/y, aHR 1.93 [95%CI 1.01-3.68]), DOAC (18 events, 1.10%/y, 2.78 [1.35-5.73]), warfarin (16 events, 2.00%/y, 4.33 [2.34-8.01]), and DOAC+AP group (6 events, 2.21%/y, 3.73 [95%CI 1.62-8.58]) had significantly higher risk and warfarin+AP group had insignificantly higher risk (3 events, 1.35%/y, 3.04 [0.90-10.29]) of major bleeding after multivariable adjustment. The DOAC (aHR 2.40 [1.35-4.08]), DOAC+AP (aHR 4.32 [2.07-9.03]) and warfarin+AP group (aHR 3.72 [2.99-19.44]) had significant higher risk of non-major bleeding than single AP group.

Conclusions: Dual AP and OAC therapy had higher risk of major bleeding events than single AP in long-term follow-up for patients with stroke and cardiovascular disease.

Figure. Cumulative rate of major bleeding



Disclosure of interest: No

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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Prior antiplatelet therapy as a predictor of higher recurrence risk and poor functional outcome among non-cardioembolic minor stroke and high-risk transient ischemic attack patients in the IMMINENT study

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Background and aims: A significant proportion of non-cardioembolic acute minor ischemic stroke (NC-AMS)/High-Risk Transient Ischemic Attack (HR-TIA) patients have the ischemic event despite being on antiplatelets. We aimed to investigate whether this factor has prognostic implications on NC-AMS/HR-TIA, in terms of recurrence risk and functional outcome. Additionally, we aimed to evaluate how was their antithrombotic treatment managed after their ischemic event.

Methods: IMMINENT study retrospectively analyzed data from all stroke patients evaluated at the emergency department of 19 Spanish hospitals belonging to the NORDICTUS stroke network between July-December 2019. Consecutive patients with NC-AMS (NIHSS≤5)/HR-TIA (ABCD2≥6 or ipsilateral stenosis ≥50%) were included. Follow-up was performed at 90 days to evaluate vascular recurrences, and functional prognosis by using the modified Rankin Scale (mRS).

Results: Of 1679 NC-AMS/HR-TIA patients, 572 (34%) were on antiplatelets before admission, 446 (27%) under aspirin monotherapy. Patients on antiplatelets were older and had higher burden of vascular risk factors (arterial hypertension, diabetes mellitus, ischemic cardiopathy, previous stroke and extracranial stenosis >50%) p<0.0001. Prior antiplatelet therapy was associated with higher proportion of vascular recurrences HR 1.568(95%CI:1.059-2.322); p=0.025 and poor prognosis (mRS>2): adjusted OR 1.384(95%CI:1.033-1.855); p=0.029. At discharge 131 patients (29%) remained on aspirin, 230 (40%) received clopidogrel, and 186 (33%) dual antiplatelet therapy.

Conclusions: Patients with NC-AMS/HR-TIA under prior antiplatelets represents a high-risk group for vascular recurrences and poor prognosis; however nearly 30% of them were discharged on aspirin monotherapy without changing antithrombotic class. These patients may particularly benefit from more intensive antithrombotic regimes.

Disclosure of interest: Yes

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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CHARACTERISTICS OF PATIENTS TREATED WITH SHORT-TERM DUAL ANTIPLATELET TREATMENT FOR MINOR STROKE OR TIA: REAL-WORLD VERSUS CLINICAL TRIALS – DATA FROM THE READAPT STUDY

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Background and aims: Short-term dual antiplatelet treatment (DAPT) is the treatment of choice for secondary prevention of minor ischemic stroke or high risk-TIA. In randomized controlled trials (RCTs) of DAPT, there were strict selection criteria that might not be strictly followed in clinical practice. We aim to describe the characteristics of patients with minor stroke or TIA treated with DAPT in a real-world setting in order to understand the differences from RCTs.

Methods: READAPT is a prospective, multicenter, real-world observational study including patients receiving short-term DAPT, that are followed-up to 90 days. We analyzed baseline data of patients included up to Jan 15th, 2023.

Results: Overall, 1578 patients from 61 centers (66,2% males; mean age 69.7±14.6 years) were included; 496 (31.4%) received DAPT after clinical TIA and 1082 (68.6%) after stroke.

In patients with stroke, 357 (32.9) patients had NIHSS >3. In patients with TIA, 100(20.0%) had ABCD2 <4. Additionally, 207 (13.1%) patients underwent intravenous thrombolysis and 25 (1.6%) endovascular treatment; 41 (2.6%) were treated with urgent carotid endarterectomy. DAPT was started within 24-hours in 1090 (69.1%) cases. Only 480 (30.4%) received a loading dose of aspirin, while 565 (35.8%) received a loading dose of clopidogrel. Overall 357 (22.2%) patients matched RCTs inclusion/exclusion criteria and followed RCTs procedures. In detail, 903 (57.2%) of patients did not match at least one inclusion criterion of RCTs and 966 (61.2%) did not exactly follow RCTs procedures.

Conclusions: DAPT in clinical practice differs from RCTs selection criteria and procedures.

Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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NOTTINGHAM FATIGUE AFTER STROKE STUDY (NotFAST2): CLINICAN, SURVIVOR AND CARER PERSPECTIVES

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Background and aims: Poststroke fatigue (PSF) is an overwhelming feeling of exhaustion, not related to exertion, which does not improve with rest. Systematic review evidence suggests it affects approximately 50% of stroke survivors. However, there is little robust evidence to support its management.

Three aims:
- Document current practice [Phase 1]
- Gain insights into management [Phase 2]
- Conduct co-design groups to inform future research [Phase 3]

Methods: Three phases.

[1] National survey of clinicians
[2] Qualitative interviews
[3] Co-design groups

We recruited:

Healthcare professionals with expertise in PSF [1, 2 & 3].
People with PSF [2 & 3].
Family/ friends providing support [2 & 3].

Results:
[1]: 305 questionnaires were analyzed from across the UK: the majority were from occupational therapists and physiotherapists. The most cited strategies were 'pacing' (67%, n=204), 'keeping a diary' (39%, n=119), and 'education' (38%, n=117).
[2]: 20 clinicians were interviewed. Common themes emerged irrespective of professional background, clinical or geographical setting: responses exactly mirrored survey results. Clinicians largely relied on personal knowledge. 20 stroke survivors and 8 care-givers were also interviewed. All described the negative impact of PSF. A range of strategies were thought useful including: acceptance, pacing, keeping a fatigue diary, talking to others, relaxation, and professional support. Most had developed strategies themselves.
[3]: 35 participants participated in co-design groups. A key message was that fatigue was debilitating and merited more research attention.

Conclusions: Research into the effectiveness of current strategies is warranted. The input of **ALL** experts in undertaking this is critical.

Disclosure of interest: No

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Tracking of Hyoid Bone in Post-stroke Dysphagia using Deep Learning Model

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Background and aims: Analysis of the hyoid bone movement is critical in evaluating the swallowing function. However, it is difficult to identify and pursuit it in fast-moving videofluoroscopic swallow study (VFSS) images. This study aims to investigate the movement of the hyoid bone in the patients with post stroke dysphagia (PSD) using a deep learning model that showed a high accuracy and efficiency in a previous study.
Methods: The VFSS video images taken from 51 patients with PSD were used. Aspiration was evident in twenty-three patients (ASP group) and twenty-eight subjects showed normal swallow or only penetration (noASP group) when swallowing thick liquid. Hyoid bone movement was tracked in the video using a deep learning model that was constructed and trained by the BiFPN-U-Net(T) network. The maximal distance of hyoid bone elevation was measured horizontally (HE-H), vertically (HE-V) and diagonally (HE-D) as shown in the Figure.
Results: The distance of the hyoid bone movement was significantly decreased in the ASP group than in the noASP group in all directions (HE-V: 1.61 ± 0.77 cm vs 1.99 ± 0.82 cm, HE-H: 1.15 ± 0.54 cm vs 1.44 ± 0.53 cm, HE-D: 1.81 ± 0.84 cm vs 2.23 ± 0.85 cm) as shown in Table ($p<0.05$ by Man Whitney-U test).
Conclusions: The results proved that the movement of the hyoid bone can be impaired in the PSD patients with evident aspiration. The usefulness of the deep learning model should be promising in tracking the hyoid bone in VFSS.

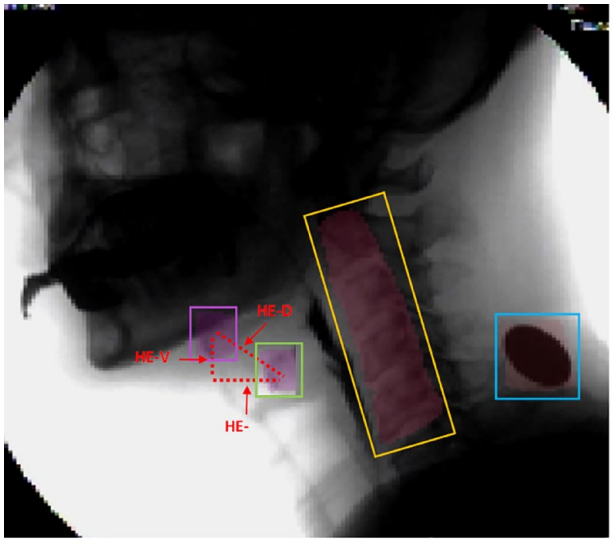

Figure. The movement of the hyoid bone (green and purple boxes) was measured by the relative distance to cervical spine segmented (yellow box) by a deep learning model. Red dotted lines show maximal distance of the hyoid bone movement measured vertically (HE-V), horizontally (HE-H), and diagonally (HE-D) from the lowest position. Green box indicates the hyoid bone in the lowest position and purple box indicates the hyoid bone in the highest position. Blue box indicates a coin attached on the neck for distance normalization.

Table. Maximal distance of hyoid bone movement in VFSS

Parameters	ASP (N=23)	noASP (N=28)	*p*-value†
HE-V	1.61 ± 0.77	1.99 ± 0.82	.029
HE-H	1.15 ± 0.54	1.44 ± 0.53	.018
HE-D	1.81 ± 0.84	2.23 ± 0.85	.015

Values are means ± SD in centimeter. ASP: Aspiration group; noASP: non-aspiration group; HE-V: maximal vertical distance of hyoid bone elevation; HE-H: maximal horizontal distance of hyoid bone elevation; HE-D: maximal diagonal distance of hyoid bone elevation. †p-value by Man Whitney-U test

Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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HOW MUCH OF A PHYSIOTHERAPY REHABILITATION SESSION FOR MODERATE TO SEVERE STROKE PATIENTS IS DELIVERED BY TWO PHYSIOTHERAPISTS?

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Background and aims: Physical rehabilitation post-stroke improves outcome and there is an associated positive dose response. In order to deliver more therapy with available resources it is important to review utilisation of staff within physiotherapy sessions. Physiotherapy sessions for this patient group are usually staffed by two physiotherapists but their utilisation within these sessions is unknown. Our aim is to review how much of a physiotherapy session is actually delivered by two physiotherapists.
Methods: A prospective observational study of 46 moderate to very severe stroke patients undertaking physiotherapy rehabilitation sessions in a UK acute stroke unit. Only sessions staffed by two physiotherapists were included. Data recorded included patient demographics (age, gender, and Barthel Index score) and time spent receiving physiotherapy interventions from either one or two physiotherapists. Observations were made between March and August 2022 by two observers.
Results: Across all stroke severities patients received 32 mins of physiotherapy per session and spent 44% (14 mins) of this receiving physiotherapy from two physiotherapists. This varied by stroke severity and ranged from 24% for moderate patients to 48% for very severe patients. A regression analysis demonstrated Stroke severity (Barthel index score) and age were associated with time receiving rehabilitation from two physiotherapists (R^2=0.379).
Conclusions: Physiotherapy sessions for moderate to severe stroke patients may not require two physiotherapists for the entire duration of the session. Further research should investigate alternative delivery models to use physiotherapy staff more efficiently.
Disclosure of interest: No

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Fatigue Level among Individuals with Stroke and its Significantly Associated Factors

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Background and aims: Fatigue might significantly influence individuals with stroke functional independence and overall quality of life and well-being. This study investigated fatigue prevalence and its associated factors among individuals with stroke in Jordan.
Methods: A cross-sectional design was adopted collecting data using the modified fatigue impact scale, 12-item Short-Form Health Survey, Montreal Cognitive Assessment, Motor Assessment Log, Upper Extremity Fugl Meyer assessment, Nine Hole Peg Test, 10 Meter Walk Testing, goniometry, Hand-held dynamometry, and modified Ashworth scale. Participants needed to have a confirmed stroke diagnosis, aged between 25 and 75 years, and a stroke chronicity of $\geqslant$ 4 months. Participants with aphasia, other neurological diseases, pregnant, or depression were excluded. Descriptive analysis was used to characterize post-stroke fatigue prevalence. Multiple variable linear regression analysis was used to identify variables significantly associated with post-stroke fatigue.
Results: 153 individuals with stroke successfully participated in this study, 42.5% were females and with an overall mean stroke chronicity of 27.3 ($\pm$44.1) months. Fatigue prevalence documented in the study sample was 69.9%. Significant predictors of post-stroke fatigue included mental component of quality of life ($p < 0.001$), cognition ($p= 0.001$), weekly sport hours ($p = 0.022$) and shoulder abduction spasticity ($p= 0.024$).
Conclusions: Post-stroke fatigue is highly prevalent in Jordan. Significant post-stroke fatigue predictors included mental related quality of life, cognition status, sport participation, and spasticity. Healthcare practitioners working in neurorehabilitation should take post-stroke fatigue and its associated factors into consideration when dealing with individuals' post-stroke.
Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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Can simple bedside tests be used to accurately predict long-term upper limb (UL) function in the acute phase post stroke? A systematic review

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Background and aims: 75% of stroke survivors experience long term upper limb (UL) impairments. In acute stroke rehabilitation using prognostic factors (PFs) to predict UL functional recovery may help clinicians to plan interventions, set realistic goals and manage patient expectations. However, many PFs are not part of usual care and therefore are not accessible to clinicians. This modified systematic review aims to identify PFs that possess clinical utility and/or are part of usual care to predict long term UL function post stroke.
Methods: A systematic search was completed of four databases between 1937-2020. Articles were assessed using pre-defined inclusion/exclusion criteria and for clinical utility. Data extraction and methodological quality assessment was completed using tools specific to PF studies. A narrative analysis was completed and outcomes summarised. Heterogenous nature of the studies meant meta-analysis was not appropriate.
Results: The electronic database search identified 6914 studies. Screening found 12 studies met inclusion/exclusion criteria and displayed clinical utility. 1272 stroke survivors were participants and the studies investigated 51 PFs. Synthesis of results identified PFs that can predict UL function for $\geqslant$6 months post stroke (Orpington Prognostic Score, UL strength, absence/minimal sensory impairment in UL, intact two-point discrimination in UL). The most reported PF was UL strength which was statistically significant in 9 studies.
Conclusions: UL recovery at 6 months post stroke can be predicted with routinely used simple measures. Re-assessment of ULs that do not display the desired PFs ensures rehabilitation is not overlooked.
Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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Self-reported life-space mobility within the first year after ischemic stroke: longitudinal findings from the MOBITEC-Stroke project

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Background and aims: Life-space-mobility (spatial extent of movement within a specified time-period), is important for patients after stroke but remains largely unexplored. This study aimed to characterize

life-space-mobility, identify associated factors and detect trajectories within the first year after ischemic stroke (IS).

Methods: MOBITEC-Stroke (ISRCTN85999967) is a longitudinal cohort-study of ambulatory stroke patients with regular assessments every 3 months after IS. We applied linear mixed-effects-models (LMM) with self-reported life-space-mobility (Life-Space Assessment/LSA) as outcome and time point, and relevant demographic and clinical measures as independent variables (sex, age, pre-stroke mobility-limitation, NIHSS, modified Rankin Scale, residential area and car availability as well as Falls Efficacy Scale-International (FES-I), and lower extremity physical function (log-transformed timed up-and-go/TUG). We elucidated typical trajectories of LSA by latent-class-growth-analysis (LCGA) and performed univariate tests for differences between classes.

Results: Study included 59 patients (mean age 71.6, SD 10.0years; 33.9% women) based on pre-specified sample-size calculation. Mean LSA at 3 months was 69.3 (SD 27.3). Pre-stroke mobility limitation, NIHSS, comorbidities, and FES-I were independently associated with the course of LSA ($p \leq 0.05$); there was no evidence for a significant effect of time point. LCGA revealed three classes: "low stable" (n=9), "average stable" (n=18), and "high increasing" (n=32). Classes differed with regard to LSA starting-value, pre-stroke mobility limitation, FES-I, and log-transformed TUG time.

Conclusions: Routinely assessing the identified measures might help clinicians to identify those patients at increased risk for failing to improve LSA. Falls efficacy and physical function are potentially modifiable and can be targeted by rehabilitative measures.

Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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Barriers and facilitators to identifying and supporting young carers of stroke survivors

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Background and aims: Young caring can enhance life skills, personal attributes, and build resilience. However, this requires the caring role to be recognised and valued, knowledge and understanding of the parental illness, family and young carer needs met, and caring workload not being excessive. Our previous research showed that mitigating factors are often not met for young carers of stroke survivors. This study aimed to identify barriers and enablers to identifying young carers of stroke survivors and the provision of support to enhance outcomes.

Methods: Semi-structured interviews were conducted with expert providers and commissioners of young carer services in the United Kingdom. Non-probability sampling was employed followed by snowball sampling. Interviews were audio-recorded, transcribed and thematically analysed.

Results: Interviews (n=12) were conducted between July 2016-February 2017 with participants from health services (4), local authorities (3), education (1) and voluntary sector (4). Experience of working with young carers ranged from 4months-20yrs (mean 8.3yrs). Three overarching themes were identified: **Challenges in identifying young carers of stroke survivors**. This included families' reluctance to engage with statutory services, organisational barriers such as a lack of clear strategy and pathways, and knowledge and skills of front line staff; **Limitations of support services**, due to resource constraints and national policy; **The importance of schools** in identifying and supporting young carers.

Conclusions: Multifactorial complex reasons contributed to the lack of identification and support for young carers of stroke survivors. Recommendations include streamlining referral pathways and upskilling front line staff in young carer identification and support.

Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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Home-based Rehabilitation for Survivors of Stroke with Severe Disability (HoRSSe Study)

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Background and aims: In the UK, over 20% of stroke survivors leave hospital with severe disability. Limited evidence-based clinical guidance is available to support their rehabilitation. Our research focusses on establishing consensus regarding the core components of home-based rehabilitation for survivors of stroke with severe disability. The barriers to implementing these core components in a real-world setting have been explored.

Methods: Stroke rehabilitation experts (n=14) including researchers, clinicians and those with lived-experience formed two virtual nominal group technique (vNGT) panels. Findings underwent qualitative content analysis to form rich overarching consensus statements.

Focus group interviews were conducted with 20 staff participants from three home-based stroke rehabilitation teams. The Context Coding Framework facilitated analysis and synthesis of findings.

Results: Findings from the vNGT were distilled into 11 overarching consensus statements. These outline core components of home-based rehabilitation for this population, including service structure, team composition, knowledge and skills required.

Focus groups reported high levels of need across multiple domains with teams being insufficiently resourced to fully meet these. Strategies to overcome these barriers included upskilling a diverse range of partners and employing multi-agency collaboration.

Conclusions: These consensus statements highlight the complexity of managing survivors of stroke with severe disability following discharge from hospital. Sufficient resources and collaborative working underpin the implementation of rehabilitation to manage the complex needs of this population.

This study supports the provision of services for this patient group, providing a benchmark for commissioners and clinicians whilst setting expectations for stroke-survivors.

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Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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RESULTS OF CLINICAL APPLICATION OF ROBOTIC TECHNOLOGIES IN REHABILITATION OF PATIENTS UNDERGONE STROKE

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Background and aims: Study the effectiveness of robotic techniques of affected limbs in post-stroke patients.

Methods: 52 patients, aged 45 to 66 years (in average 52±12) suffered an ischemic or hemorrhagic stroke with paresis of right or left limbs, 54% were women and 46% were men. 2 groups were formed for the period from 2016 to 2018. All participants were in early recover period. The main group 28 (54%) and controlling 24 (46%) patients. The procedure was performed on the simulator – LococmatPro robotic.
Results: The dynamics of muscle tone, muscle strength of the lower extremities in both groups on the Barthel's and GAS scale were studied, the main group of patients additionally engaged in robotic technology are provided with more positive dynamics. In the control group, 9 patients have 68±2 points, 11 have 47±4 points and 4 patients have 36±2 points. In the main group, 12 patients have 93±4 points, 14 have 95±6 points and 2 patients have 66±3 points. In the control group, 37.5% there is complete dependence and in the remaining 66.5%($p \leq 0,01$) there is a moderate stage of dependence of patients. In the main group, early restoration of viability of the motor system of patient was revealed and in all cases there is a slight dependence. Total score averaged 43±6 and 62±3 points($p \leq 0,05$) in control and main groups respectively.
Conclusions: Introduction of the modern robotic technology into the process of physical rehabilitation of patients after a stroke allows early recovery of lost motor activities.
Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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Development of a patient-centered transition program for stroke patient and their caregivers, combining case-management and access to an internet information platform – A user-centered design approach

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Background and aims: When returning home, stroke patients and their caregivers face a significant lack of support and information that accentuates their psychosocial burden. Currently, there is no transition program targeting the psychosocial aspects of recovery. We aimed to co-design a program combining case-management and an internet information platform to address psychosocial needs of stroke patients and caregivers.
Methods: A two-step methodology was used. The first step followed a "user-centered design" iterative approach during 4 workshops. Aim was to develop the platform and define the profile of the case-manager following needs and expectations of the participants. The second step was a usability test of the platform following a Think Aloud method with patients and caregivers. The workshop and interviews were audio recorded and a qualitative thematic analysis was conducted. The analysis of Think Aloud interviews was based on User Experience Honeycomb framework by Morville.
Results: Eight participants attended the workshops: 2 patients, 2 caregivers, 3 nurses and a general practitioner. The activities, training and skills of the case-manager were defined according to patients and caregivers needs. The name, graphics, navigation, and content of the platform were worked on with the participants a developer and a graphic designer. The usability of the platform was tested with 5 other patients and 5 caregivers. Think Aloud results highlighted satisfaction with the graphics and content and a need for improvement regarding the navigation.
Conclusions: We developed, with a participatory approach, a patient centered transition program, which will be evaluated in a randomized controlled trial.
Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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ADVANCING SUSTAINABLE HEALTHCARE THROUGH STROKE TEAM REHABILITATION, FROM A PHYSIOTHERAPY PERSPECTIVE

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Background and aims: Climate change is recognised as the largest threat to health in this century since it fundamentally undermines the environmental conditions supporting human life on earth. This threat also presents the greatest opportunity to redefine the social and environmental determinants of health, calling healthcare professionals and departments to drastically reduce carbon emissions in the clinic, considering the health system produces 5% of the European Union's carbon emissions. This study aims to explore the role clinical stroke team rehabilitation plays in achieving a sustainable healthcare.
Methods: A narrative review of the literature was conducted to explore contributions of stroke team rehabilitation interventions to sustainable healthcare. Findings were categorized according to principles of sustainable healthcare developed by the Centre for Sustainable Healthcare, referring to low carbon healthcare without compromising quality of care.
Results: We identified four central aspects in which stroke team rehabilitation contributes to principles of sustainable healthcare; *the provision of timely interventions which optimize functioning after stroke, interventions supporting self-efficacy and empowerment, tele rehabilitation as an alternative delivery mode to usual healthcare visits* and, *interventions of secondary prevention and health promotion* (figure 1).
Conclusions: Team rehabilitation is key to attain sustainable stroke care as interventions contribute to all principles of sustainable healthcare, actively targeting prevention, empowerment, and lean pathways, in turn leading to low carbon activities and lower operational resource use. We call for evaluations of healthcare interventions from a perspective of sustainable development to uncover the true value of interventions, including social, economic, and environmental aspects.

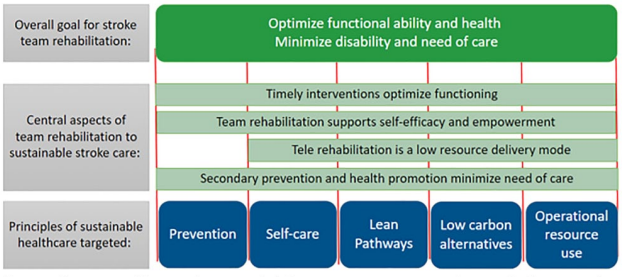

Figure 1. Illustration of how stroke team rehabilitation interventions contribute to the five principles of sustainable healthcare.

Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

1071

DIFFERENCES IN AEROBIC CAPACITY AND ACTIVITY PATTERN BETWEEN HIGH AND LOW RESPONDERS AFTER HIGH INTENSITY INTERVAL TREADMILL TRAINING - SUBANALYSIS OF THE HIIT STROKE STUDY

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Background and aims: The primary aim of this study was to investigate differences in physical activity pattern between high and low responders to an 8-week high-intensity interval training program.

Methods: We analyzed data from the intervention arm in the HIIT-stroke study where participants recruited from three Norwegian hospitals, with first ever stroke between 18 and 75 years of age, 3 to 5 months post stroke with no serious co-morbidities were randomized to 24 supervised treadmill sessions with work periods of 4x4 minutes at an intensity between 85-95% of peak heart rate (HRpeak) interspersed with 3 minutes of active work periods at 50-70% of HRpeak, or standard care. Participants were classified in low (0-9% improvement) and high (⩾10% improvement) responders. Mixed linear model was used to analyze differences in activity pattern between the groups. ActivPAL accelerometers assessed activity patterns, 6-minutes-walk-test assessed walking distance and VO_2peak assessed cardiorespiratory fitness.

Results: The mean(SD) age was 60.7(8.1) versus 56.1(9.4) years, and 50% versus 76.5% were male in high(n=16) and low(n=17) responders, respectively. The 6-minutes-walk-test revealed on average 117 meters shorter walking distance and 7 mL/kg/min^{-1} lower VO_2peak in high compared to low responders at baseline. There were no differences in activity pattern between the groups during follow-up.

Conclusions: High response to the HIIT-intervention was not associated with increased activity pattern. However, poorer physical capacity at baseline in the high responder group, indicate that a predicting factor for improvement of aerobic capacity and activity levels are lower baseline levels of cardiorespiratory fitness.

Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

1130

Characteristics of gait in post-stroke patients during the rehabilitation process: a preliminary study using muscle synergy analysis

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Background and aims: Although gait performance of post-stroke patients commonly improves along with rehabilitation processes, most of clinicians know that the level of recovery includes variability. We hypothesize that muscle synergy in the early recovery phase affects this variability during recovery. Muscle synergy during walking is associated with lower-limb angle and gait performance. However, this association has been examined in a cross-sectional design, and the temporal precedence is unclear. The purpose of this study was to identify discrepancies in the association between gait characteristics and muscle synergy during the longitudinal recovery in post-stroke patients.

Methods: 10 post-stroke patients who walk independently participated in this study. We instructed them to walk at comfortable speed and obtained two longitudinal data at 1-month interval. We analyzed lower-limb angle (OpenPose), trunk instability, and number of modules extracted by nonnegative matrix factorization (Delsys) during walking. Longitudinal recovery was confirmed by calculating change rate. Spearman's rank correlation coefficient was used to determine the relationship between variables.

Results: In the first measurement, walking speed was significantly associated with Fugl-Meyer synergy score (ρ=0.84, p=0.005) and trunk instability (ρ=−0.84, p=0.004). The number of modules was not significantly associated with walking speed (ρ=−0.05, p=0.90), and we found 2 cases with 4 modules and slow walking speed. These cases showed a higher change rate in walking speed than the others.

Conclusions: Characteristics of cases with discrepancies between walking speed and number of modules suggests that muscle synergy has temporal precedence for improvement in gait performance.

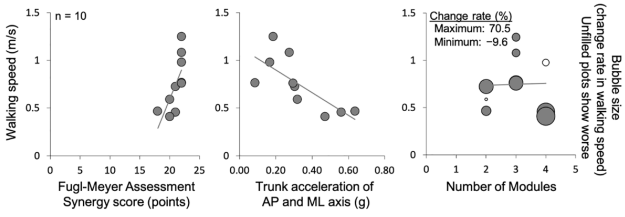

Figure. Association between walking speed and motor paralysis, gait characteristics.

Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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Predicting the functional outcome of intensive inpatient rehabilitation after stroke: results from the RIPS study

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Background and aims: The heterogeneity of stroke sequelae, outcome measures and rehabilitation pathways, and the lack of extensively validated prediction models represent a challenge in predicting stroke rehabilitation outcomes. We aimed to prospectively explore a multidimensional set of variables collected at admission to inpatient post-stroke rehabilitation as potential predictors of functional level at discharge.

Methods: A multicentric prospective observational study, consecutively recruiting patients aged 18+, with ischemic/haemorrhagic stroke,

undergoing inpatient rehabilitation within 30days from event, December 2019-December 2020. The functional outcome was disability in activities of daily living, measured by the modified Barthel Index(mBI) at discharge. Potential multidimensional predictors, assessed at admission, included demographics, event description, clinical assessment, functional and cognitive profile, and psycho-social domains. The variables statistically associated with the outcome in the univariate analysis were fed into a multivariable model using multiple linear regression.

Results: A total of 220 patients were included (median [IQR] age: 80 [15], 112 women, 175 ischemic). Median mBI was 26 [43] at admission and 62.5 [52] at discharge. In the multivariable analysis younger age, along with better functioning, fewer comorbidities, higher cognitive abilities, reduced stroke severity, and higher motor functions at admission, remained independently associated with higher discharge MBI. The final model allowed a reliable prediction of discharge functional outcome (adjusted R2=77.2%).

Conclusions: The model presented in this study, based on easily collectable, reliable admission variables, could help clinicians and researchers to predict the discharge scores of the global functional outcome for persons enrolled in an reproducible and evidence-based inpatient stroke rehabilitation program

Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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PUSHING FOR RECOMMENDATIONS FOR MANAGEMENT OF POST-STROKE LATEROPULSION: BEST PRACTICE REHABILITATION ACCORDING TO A PANEL OF EXPERTS

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Background and aims: People with post-stroke lateropulsion actively push their body across the midline to the more affected side and/or resist weight shift toward the less affected side. Post-stroke lateropulsion is prevalent and associated with poor rehabilitation outcomes, but no clinical practice guidelines for its rehabilitation currently exist. The study aimed to develop consensus-based clinical practice recommendations for managing post-stroke lateropulsion.

Methods: This Delphi Panel Process conformed with the Guidance on Conducting and Reporting Delphi Studies (CREDES) recommendations. Panel members had demonstrated clinical and/or scientific background in rehabilitation of people with post-stroke lateropulsion. The process consisted of four electronic survey rounds. Round One consisted of open questions, developed in consultation with two people with lived experience of post-stroke lateropulsion. Subsequent rounds ascertained levels of agreement with statements derived from Round One. Consensus was defined *a priori* as ⩾75% agreement (agree or strongly agree), or ⩾70% agreement with 'unsure' responses excluded.

Results: Twenty international experts completed all four rounds. A total of 49 consensus-based recommendations were compiled regarding elements of optimal rehabilitation (29 statements) and considerations for management of lateropulsion, informed by severity of lateropulsion, the person's awareness of their lateropulsion, and individual stroke and person-related factors (20 statements).

Conclusions: In the absence of evidence-based clinical guidelines, these recommendations present the best available expert opinion for lateropulsion management, building on existing evidence to guide selection of interventions for post-stroke lateropulsion. Future research is required to elaborate specific rehabilitation strategies, particularly considering the influence of additional cognitive and perceptual impairments.

Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

1273

EVALUATION OF A STROKE SPECIFIC FALLS SCREENING ON AN ACUTE STROKE UNIT

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Background and aims: Within the acute stroke population, a considerable proportion of patients fall at least once during hospital admission. A tool was developed to support falls risk assessments on an acute stroke unit in a London hospital. The tools effectiveness at predicting those at high risk of falls is unknown.

To establish if this tool can effectively predict patient falls on an acute stroke unit.

Methods: A stroke specific falls screening tool was developed following literature review and clinical notes review of the factors associated with falling in acute stroke patients. The tool was implemented for all stroke patients during initial therapy assessment, they were scored at either high or low risk of falls. The sensitivity and specificity of the tool were calculated based on three months of falls data using the local incident reporting portal.

Results: A total of 35 patients were screened of which, six fell. The screening tool identified four of these patients as high risk (sensitivity = 0.67). Of the 29 patients who did not fall, the tool identified 13 of these as low risk (specificity = 0.45). Of the 15 patients who were classified as a low risk of falls, 13 did not fall (negative predictive value = 0.87). In contrast, of the 20 high risk patients, 4 fell (positive predictive value = 0.2).

Conclusions: The tool has better accuracy at identifying patients who do not fall, rather than predicting those who do fall. This may support decision making in targeting falls prevention methods.

Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

1274

Development of a tailored intervention targeting sedentary behavior and physical activity in people with stroke and diabetes: a qualitative study using a co-creation framework

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Background and aims: Type 2 diabetes and sedentary behavior pose serious health risks in stroke survivors. Using a co-creation framework, this study aimed to develop an intervention in collaboration with stroke survivors with type 2 diabetes, relatives, and cross-sectoral healthcare professionals to reduce sedentary behavior and increase physical activity.
Methods: This qualitative explorative study used a co-creation framework consisting of a workshop and focus group interviews with stroke survivors with type 2 diabetes (n=3), relative (n=1), and healthcare professionals (n=10) to develop the intervention. A content analysis was used to analyze data.
Results: The developed Everyday Life is Rehabilitation (ELiR) intervention consisted of a tailored 12-week home-based behavior change intervention with two consultations of action planning, goal setting, motivational interviewing, and fatigue management including education on sedentary behavior, physical activity, and fatigue. The intervention has a minimalistic setup using a double-page paper "Everyday Life is Rehabilitation" (ELiR) instrument making it implementable and tangible.
Conclusions: In this study, a theoretical framework was used to develop a tailored 12-week home-based behavior change intervention. Strategies to reduce sedentary behavior and increase physical activity through activities of daily living along with fatigue management in stroke survivors with type 2 diabetes were identified.
Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

1292

Associations between health literacy and clinical outcomes one year after stroke: a cross-sectional study

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Background and aims: Life after stroke may imply lifestyle changes, new routines with rehabilitation, self-management of medications, and healthcare follow-ups. For stroke survivors, the ability to understand and use health information, i.e., health literacy, is imperative. The aim was to investigate health literacy 12 months post-stroke, to confirm previously reported associations with physical functioning (walking ability), and to explore associations with self-rated stroke recovery and participation, and signs of depression.
Methods: Health literacy was assessed with the Health Literacy Survey comprising 16 items focusing on four dimensions, the ability to: access/obtain health information, understand health information, process/appraise health information, and apply/use health information. Logistic regression was employed to assess the associations between health literacy and physical functioning as per walking ability; self-rated recovery and participation using the Stroke Impact Scale; signs of depression using the Hospital Anxiety and Depression Scale.
Results: Participants, n=108, were on average 72 years old, had mild stroke 60%, university/college degrees 48%, and 64% were men. Almost two-thirds had adequate health literacy. Higher health literacy was significantly associated with favourable outcomes, i.e., walking ability (OR 1.21, 95% CI 1.00-1.45), self-rated recovery (OR 1.28, 95% CI 1.09-1.50) and participation (OR 1.34, 95% CI 1.13-1.59) and signs of depression (OR 0.81, CI 95% 0.70-0.94) regardless of age, sex, and education level.
Conclusions: High health literacy is associated with favourable outcomes after stroke and an important factor to consider and include in post-stroke care and rehabilitation. Population based, longitudinal studies of health literacy among stroke survivors are warranted.
Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

1401

ROBOT-ASSISTED GAIT THERAPY USING THE LOKOMAT PRO FREED IN THE SUBACUTE PHASE OF ISCHEMIC STROKE

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Background and aims: Robotic-assisted gait training (RAGT) represents a modern concept of post-stroke neurorehabilitation. Our aim was to assess the additive effect of RAGT on functional characteristics of gait in subacute phase of stroke (<6 weeks).
Methods: This is an interim analysis of a randomised study with PROBE desing (1:1, Clinical trial: 04910217). Conventional rehabilitation (physio-, occupational- and mechanotherapy) is used for both groups: 60 min/day (5 times/week, 15 times total). Lokomat group receives additional therapy in Lokomat Pro FreeD (20-50 min/session, 5 times/week, 15 times total). Primary outcome is the functional ambulation category (FAC) at 3 months; secondary outcomes include: 10 Metre Walk Test (10MWT) and sarcopenic index (SI) at 3 months.
Results: 170 patients were screened between June-1, 2020 and June-30, 2022; 32 patients (37% women) met inclusion criteria and had complete 3-month follow-up (15 in Lokomat and 17 in conventional rehab group). Median time to randomization was 13 days [interquartile range/IQR: 11-16], median age was 66 years [IQR: 58-70]). DWI-MRI confirmed MCA stroke in 23 (72%), PCA in 2 (6%), VB stroke in 7 (22%) patients.

Patients in Lokomat group showed a significant improvement in the 10MWT (p=0.027), TUG (p=0.008), and SI ($p<0.001$). There was a significant difference between Lokomat vs. conventional rehab group in the improvement of TUG (p=0.046) and SI (p=0.037).
Conclusions: We proved a significant improvement in 10MWT time, TUG and increase in sarcopenic index in subacute stroke patients with RAGT as an additive therapy.
Supported by MH CZ-DRO - FNOs/2020.
Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

1404

Factors associated with decreased gait speed on uneven surface in stroke patients

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Background and aims: Stroke patients have difficulty walking in outdoor environments, including uneven surfaces, leading to reduced opportunities for social participation. It is important for clinicians providing rehabilitation to know the characteristics of physical function that make it difficult for stroke patients to adapt to uneven surfaces. The purpose of this study is to examine the parameters during even surface walking in stroke patients that are associated with decreased gait speed on uneven surface.
Methods: Forty-seven stroke patients walked on even and uneven surfaces. Data were collected from video cameras and electromyographs attached to the paralyzed leg to calculate decreased gait speed rate from even to uneven surface, trailing limb angle (TLA), muscle activities of soleus (SO) in the stance phase acting on propulsive force and biceps femoris (BF) acting on shock absorption in the loading response. For statistical analysis, a regression model of decreased gait speed rate was calculated using age, Fugl-meyer assessment in the lower extremity, TLA, SO and BF activity as independent variables. The significance level was set at 5%.
Results: The multiple regression analysis explained 44% of the variance in decreased gait speed rate ($p < 0.001$). Also, the significant independent contributing predictors of decreased gait speed rate were low Fugl-meyer assessment ($\beta = 0.461$, $p = 0.003$) and low BF activity ($\beta = 0.289$, $p = 0.046$).
Conclusions: We found that in addition to motor paralysis, BF activity in the loading response is associated with decreased gait speed on uneven surface in stroke patients.
Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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TESTING THE HEADS: UP ONLINE INTERVENTION FOR SELF-MANAGEMENT OF DEPRESSION AND ANXIETY SYMPTOMS POST-STROKE USING ONLINE RECRUITMENT AND DELIVERY IN RESPONSE TO COVID-19

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Background and aims: Mood disorders are common after stroke, often persisting long-term with poor outcomes. Mindfulness Based Stress Reduction courses are effective in helping self-manage symptoms of anxiety and depression. Previous development work and face-to-face (FtF) feasibility piloting of HEADS: UP (Helping Ease Anxiety & Depression after Stroke) demonstrated acceptability and feasibility. In response to COVID-19 restrictions HEADS: UP FtF was optimised, adapted, and tested for online delivery within a non-randomised feasibility pilot.
Methods: Working with a wider collaborator group, and Project Advisory group we tested online recruitment (gatekeeper/network liaison, social media) and screening/enrolment processes using supportive resources (internet access; Zoom). HEADS: UP online was delivered implementing adapted mindfulness trainer training. Quantitative and qualitative data collection (Baseline and Time 1.0) included online/postal questionnaires and online focus groups/interviews.
Results: We enrolled stroke survivors (n=9), and family members (n=30) (female n=5, 55.6%; mean age 54.2 years), course attendance 67% (feasibility target 70%, attendance $\geqslant$ 4 sessions), attrition 44% (bereavement, poor health, lost to contact). Indicative findings suggested improvement in quality of life and mood (across all scales) although postal strikes eliminated some postal returns. Qualitative findings found a positive response to HEADS: UP online, *"I felt I was among people again, not just my situation. . . it's been really good for me in many ways."*
Conclusions: HEADS: UP online research processes and course delivery were found to be feasible, acceptable, and beneficial.
Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

1685

INSIGHT IN STROKE PATIENTS IN AN ACUTE SETTING: MAGNITUDE OF CHANGE AND RELATIONSHIP WITH FUNCTIONAL OUTCOME

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Background and aims: Impairment in insight is often a significant contributor to poorer outcomes, less is known about the trajectory of change and development of insight over time and the specific factors associated with this.
To assess if patients' insight will improve over time and the impact of this on functional outcome.
Methods: 82 patients were recruited from the acute stroke unit at a district general hospital. Patients were asked to complete the Visual Analogue Test for Anosognosia for Activities of Daily Living (VATA-ADL) on admission and on discharge. Therapists completed the Therapy Outcome Measures (TOMS) on admission and discharge. Patient's mood was assessed using the DISCS and Distress thermometer.
Analysis: Repeated-measures ANOVA and Spearman's rho.
Results: There was a significant improvement in Total insight across all domains from admission to discharge ($p<.001$).
There was a significant relationship between Change in Total Insight and TOMS Impairment (p=.005), with improvements in Total Insight significantly associated with reduced difficulties in the domain of Impairment.
Conclusions: The majority of patients show significant improvements in insight for functional activities (self-care and community-based activities inside and outside the home). Greater insight does not always result in reduced mood nor is directly related to functional difficulties and other moderating factors need to be explored. This study included patients with communication difficulties and broadens our knowledge of insight in stroke. Limitations of the study was limited mood data. We plan to extend this study across the stroke pathway from acute to discharge from community services.
Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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Do stroke survivors find daily breakfast group interventions acceptable and feasible? The Breakfast Group Interventions in Stroke Rehabilitation Study (BISTRo)

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Background and aims: Stroke survivors desire opportunities to practice eating and drinking in rehabilitation to become independent and confident with social dining (Jones & Nasr, 2018).

Aim: BISTRo aimed to codesign an acceptable and feasible breakfast group intervention with stroke survivors, carers and health care professionals.

Methods: BISTRo is a mixed methods study. A prototype intervention was iteratively tested in three UK hospitals. Version 1 was tested for ten sessions in site one and version 2 was tested for ten sessions in sites two and three. Acceptability and feasibility were investigated using patient interviews (n=12), staff focus groups (n=21) and ethnographic observations (n=6). Data sets were analysed separately and together using an inductive approach (Harden et al., 2004). A triangulation process addressed completeness, convergence, and dissonance (Farmer et al., 2006).

Results: Sixteen stroke survivors were recruited (9 female and 7 male), mean age of 71 years (SD 8.9), White British (13), African (2), Caribbean (1), 89% of the sessions were attended (SD 1.4).

Triangulation found five common themes (1) feelings of normality (2) having fun and enjoyment (3) feeling human again, 'you're not just a stroke in the group'. (4) not being alone, opportunities to socialise were perceived as reducing social isolation (5) learning from each other, stroke survivors were observing one another for inspiration in their own rehabilitation journey.

Conclusions: Stroke survivors thought that breakfast group interventions were acceptable and feasible. BISTRo also provided key insights into the contexts and mechanisms required for a future definitive intervention trial.

Disclosure of interest: No

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Psychoeducation after acute brain injury- A scoping review

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Background and aims: Psychoeducation is an intervention which involves structured disease specific information and support aimed at improving coping and understanding. Evidence has shown that this type of intervention improves outcome in mental illness and other medical illnesses. The aim of this scoping review is to identify the evidence relating to psychoeducational interventions following acute brain injury.

Methods: This review was conducted in line with the PRISMA Extension for Scoping Reviews. Three electronic databases (MEDLINE, Embase, PsycINFO) were searched for articles relating to psychoeducation interventions following acute brain injury. Search retrieved 5.492 articles (after removal of duplicates), titles, abstracts and full texts were screened, and data extracted for included studies. The quality of randomised control studies was assessed using JADAD scale. TIDieR scale was used to describe interventions.

Results: Twenty-eight studies were included with a total of 1896 participants. Nineteen of the studies were randomised control studies, all with a JADAD score $\geqslant$ 2 Fourteen studies were in stroke, eight in traumatic brain injury and six in acquired brain injury. There was heterogeneity in study design, intervention and outcome measures used. Eleven randomised control studies showed significant improvements in fatigue, emotion, or quality of life

Conclusions: Psychoeducation may improve life after acute brain injury, however interventions to date have been varied and used a wide range of outcome measures. Standardisation would be needed to facilitate reproducibility.

Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

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IMPACT OF A PHYSICAL REHABILITATION INTERVENTION ON EARLY RECOVERY OUTCOMES IN PATIENTS WITH HEMISPHERIC ISCHEMIC CEREBRAL STROKE

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Background and aims: Due to a growing prevalence of hemispheric ischemic cerebral stroke (hICS) it is important to determine impact of a physical rehabilitation intervention (PRI) on the early recovery outcomes in patients with hICS.
Methods: Ninety-eight patients (mean age 59,8±0,78 years old) with moderate hICS (6-13 points by NIH Stroke Scale) were divided into 2 groups: 50 patients receiving PRI (physical therapist guided classes for 2 hours daily) and 48 patients not receiving PRI. Cognitive functions, psycho-emotional status, motor functions recovery and disability levels on 180th day after hICS onset were assessed using specialized scales in all patients (Fig. 1).
Results: In patients receiving PRI, indicators of motor, cognitive and psychical functions in 6th month after onset were significantly higher compared to these in patients not receiving PRI (Fig. 2). Daily living independency and balance were much more improved by PRI due to better motor rehabilitation. Anxiety and depression were also reduced more effectively by PRI because of lower levels of disability. As compared with patients receiving PRI, cognitive recovery in patients not receiving PRI was a little worse.
Conclusions: To increase the effectiveness of motor and cognitive functions recovery, the application of rehabilitation interventions using PRI is recommended.

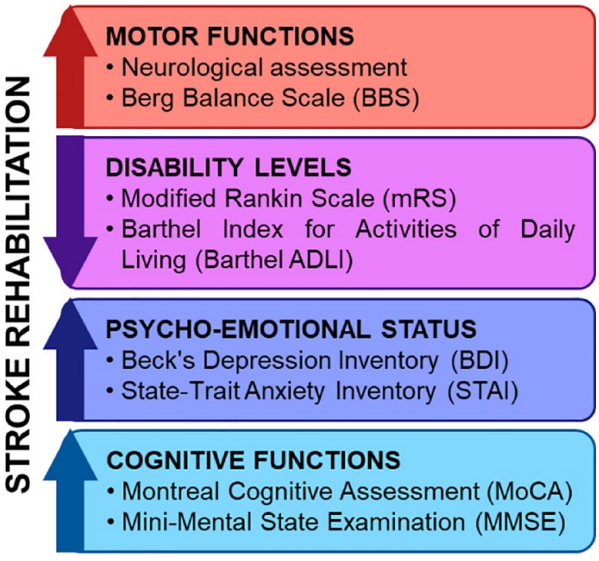

Figure 1. Structure of assessments of hICS recovery.

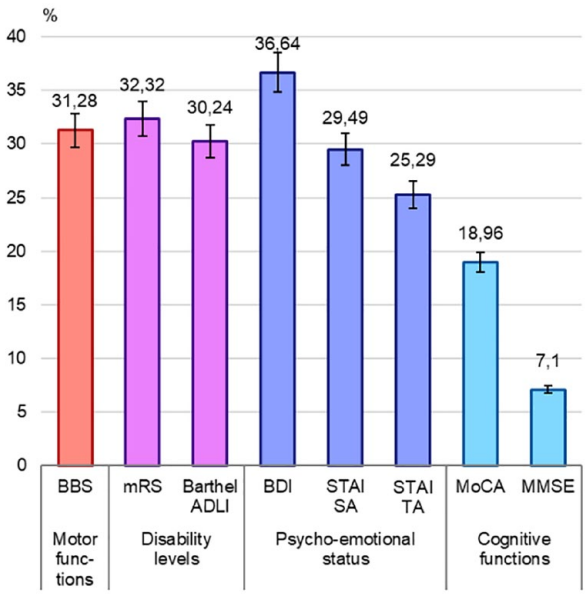

Figure 2. Additional improvement in the average score of scales for PRI compared to without PRI.

Disclosure of interest: No

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Aphasia in Acute Ischemic Stroke Patients and Disability at 1 Year

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Background and aims: The effect of aphasia on disability at 1 year in acute ischemic stroke patients is not well characterized. Methods: We analyzed patient level data from three randomized multicenter clinical trials that recruited acute ischemic stroke patients within 3 or within 5 hours of symptoms onset. Aphasia was identified by National Institutes of Health Stroke Scale (NIHSS) score item 9 (range 0–3, where 1–3 indicates aphasia). Moderate to severe disability was defined by **modified Rankin Scale [mRS] of 3-5 at 1 year among patients with ischemic stroke.**
Results: Aphasia was seen in 734 (50.6%) patients among a total of 1451 acute ischemic stroke patients (mean age ± SD; 66.2 ± 13.4 years). There is no difference in the rates of moderate to severe disability at 1 year in patients with aphasia at presentation 220/734 (30%) as compared with those without aphasia 213/717(30%); p=0.91. The overall rates of moderate to severe **disability at 1 year according to severity of aphasia were as follows:** mild-to-moderate aphasia**; 42 (30%); severe aphasia; 74 (28.6%); and mute/global aphasia; 104 (31%); p = 0.93.**
Conclusions: Neither occurrence nor severity of aphasia increased the rate of moderate to severe disability at 1 year in patients with acute ischemic stroke. Most acute ischemic stroke patients with aphasia appeared to have none to mild disability at 1 year.
Disclosure of interest: No

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Early Evidence of Altered Neural Mechanisms during Robotic Assisted Gait after Stroke

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Background and aims: Robotic-Assisted Gait training (RAGT) offers an innovative therapeutic option for restoration of functional gait in stroke survivors, complementing existing physical rehabilitation strategies. However, there is a limited understanding of the neurophysiological response induced by this training in end-users. Neural desynchronization and Cortico-Muscular Coherence (CMC) are two biomarkers that define the level of muscle-cortex association during gait phases and can be used to estimate user adaptation induced during RAGT.
Methods: In this pilot study, we measured EEG and EMG and associated event-Related Spectral Perturbation (ERSP) and CMC in three healthy individuals and three subacute stroke survivors during overground-gait with and without an exoskeleton.
Results: Results demonstrate (1) exoskeleton gait in healthy individuals is associated with a different and more refined motor-control represented in a high θ-desynchronization, (2) altered and noisy ERSP and lower and non-focal β-CMC patterns are observed in Stroke patients when performing overground-gait with and without the Exoskeleton, and (3) Exoskeleton use in stroke survivors was further associated with a reduction in swing-time during gait-cycle, but this effect was not correlated with an increment of θ-desynchronization and/or β-CMC. ERSP and CMC demonstrated evidence of neural modulation in healthy individuals during RAGT, that could not be detected in subacute stroke survivors during RAGT.
Conclusions: Results suggest that gait-parameters changes observed during an exoskeleton walking session in subacute stroke survivors were unlikely to be neurally driven.
Disclosure of interest: No

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Changes in Carotid-Femoral Pulse-Wave Velocity (cf-PWV) after Acute Ischemic Stroke

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Background and aims: Carotid-femoral pulse wave velocity (cf-PWV) is a reliable measurement of aortic stiffness and an independent predictor of future cardiovascular events. We aim to research changes of cf-PWV in the acute phase of ischemic stroke.
Methods: Cf-PWV of 20 ischemic stroke patients participating in the STROKE-CARD Registry trial (NCT04582825) was measured at day 1 or 2 of admission and on three further timepoints of up to day 10 with the Vicorder® system (SMT Medical Technology GmbH, Germany) in a supine position with a head tilt angle of 45 degrees. The mean of two cf-PWV was used for every time-point.
Results: In the first 11 patients included, the mean values of the differences (Δ mean) between the first and fourth measurement the cf-PWV decreased by 1.4 m/s during hospitalization. Furthermore, the mean values of cf-PWV decreased nearly linearly between each measurement time point in all patients.
Conclusions: Preliminary results show that after ischemic stroke, cf-PWV levels decrease within the first 10 days. We hypothesize that cf-PWV is elevated early after ischemic stroke due to an acute stress reaction with systemic activation of the autonomous nervous system. Clinicians and researchers should be aware of this fact, when using cf-PWV in the hyperacute phase to predict future vascular risk.
Disclosure of interest: No

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BETA-2 MICROGLOBULIN, LIPOCALIN-2 AND CYSTATIN C-NOVEL BIOMARKERS OF STROKE RISK IN THE CHINESE POPULATION

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Background and aims: Beta-2-microglobulin (B2M), lipocalin-2 (LCN-2) and cystatin C are known as renal biomarkers. However, their roles in stroke remain unclear. In this study, we aimed to study the relationship of B2M, LCN-2 and cystatin C with stroke risk in a Chinese population.
Methods: The present study included 1060 participants recruited from 2020 to 2021 in the Shenzhen-Hong Kong United Network on Cardiovascular Disease (SHUN-CVD) study. Stroke risk groups were classified as low-risk, middle-risk and high-risk groups according to the China National Stroke Screening Survey criteria. Serum biomarker levels were measured using an immunoturbidimetric assay. Ordinal regression was used to investigate the relationship of serum B2M, LCN-2 and cystatin C with stroke risk.
Results: The mean age of the participants was 45.4 $\pm$ 10.8 years, and 485 (46%) were men. The number of participants in low-risk, middle-risk and high-risk group were 663, 143 and 254 respectively. Serum B2M, cystatin C and LCN-2 levels were significantly associated with sex, smoking, alcohol consumption, overweight/obese and hypertension. There was a significant association of serum B2M, cystatin C and LCN-2 levels with stroke risk (B2M: β=0.726, $P<0.001$; LCN-2: β=0.561, $P<0.001$; cystatin C: β=4.205, $P<0.001$). After adjusting for age, the association remained significant (B2M: β=0.595, $P<0.001$; LCN-2: β=0.564, $P<0.001$; cystatin C: β=3.718, $P<0.001$).
Conclusions: B2M, LCN-2 and cystatin C are significantly associated with stroke risk, allowing clinicians to use them as novel biomarkers in the assessment of stroke risk.
Disclosure of interest: No

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Hospital Remoteness, Stroke Demographics and Subtype

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Background and aims: Almost one third of the Irish population live in a rural area. Hospital remoteness has been associated with poorer outcomes in stroke. We sought to determine if hospital remoteness was associated with certain stroke demographic patterns.
Methods: Data from the Irish National Audit of Stroke (INAS) on age and stroke type were analysed from 25 hospitals over five years (2017-2021). Hospital remoteness was indicated by two surrogate markers, distance to the nearest acute hospital and whether the hospital was located within 10 kilometres of the national motorway system.
Results: During the 5-year period, 21, 686 strokes were admitted to 25 acute hospitals. Haemorrhagic stroke accounted for 13% (n=2819), whilst 25% of all strokes occurred in those ⩽65 years. Median distance to the nearest acute hospital on road was 41km and 72% (n=18) of hospitals were within 10km of the national motorway system. A strong negative correlation was observed between the percentage of young stroke cases and hospital remoteness indicated by distance to the nearest acute hospital ($r=-0.73$, $p<0.001$ Pearson Correlation) and proximity to the motorway network ($p<0.0001$, Chi Square). Remote hospitals are significantly less likely to admit haemorrhagic stroke cases ($p<0.001$ Chi square). There was no association between hospital remoteness and sex ($p = 0.86$).
Conclusions: Remote hospitals in Ireland admit a significantly lower proportion of young strokes. Ischaemic strokes are statistically more likely in hospitals located more than 10 kilometres from the national motorway system
Disclosure of interest: No

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Elevated Homocysteine (Hcy) level as a risk factor for stroke and its subtype: A systematic review and meta-analysis

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Background and aims: The findings on the association between elevated plasma homocysteine levels and the risk of ischemic stroke (IS) as well hemorrhagic stroke (HS) types have been inconsistent. Therefore, we aimed to evaluate whether elevated homocysteine levels are associated the risk of IS with the trial of org 10172 in acute stroke treatment (TOAST) as well HS types using a meta-analysis.
Methods: A systematic search of electronic databases were conducted for studies reporting homocysteine levels in ischemic/hemorrhagic stroke and the TOAST of ischemic stroke to 30th Nov, 2022. All the data were analyzed using Stata software version 12.0.
Results: Our meta-analysis revealed that the IS (SMD = 1.43, 95% CI = 0.85 to1.45) as well as HS (SMD = 0.95, 95% CI = 0.76-0.98) group had significantly higher levels of homocysteine than controls. Further subgroup analyses based on TOAST classification, we also observed that patients with large-artery atherosclerosis (SMD = 2.12, 95% CI = 1.40 to 2.84), small-vessel occlusion (SMD = 1.10, 95% CI = 0.72 to1.48), cardioembolism (SMD = 1.17, 95% CI = 0.64 to1.71), stroke of other determined etiology (SMD = 0.88, 95% CI = 0.53 to 1.24) and stroke of undetermined etiology (SMD = 1.50, 95% CI = 0.66 to 2.33) also had significantly higher levels of homocysteine compared to those in the control group.
Conclusions: This meta-analysis found that stroke patients had significantly higher homocysteine levels than the controls, suggesting that serum homocysteine levels may be a predictive marker for stroke and its subtypes.
Disclosure of interest: No

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High risk Adaptive Stroke Education (HAStE): Primary Care -Vascular Neurology partnership in rural Michigan, USA: Preliminary Results

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Background and aims: Urban-rural disparities in life expectancy have widened over the past decade and 7.1% of the deficit in rural-urban life expectancy is attributed to stroke. We hypothesize that patient-centric stroke education can be delivered in a cost-effective manner in a rural county.
Methods: High risk patients are defined as Atherosclerotic Cardiovascular Disease (ASCVD) 10-year risk of ⩾ 20% for cardio-cerebrovascular events. Patients seeking primary care in Greenville (Intervention) and Muskegon (Control) are included in this study. Education material includes lifestyle modification and stroke signs-symptoms information. Electronic medical records (EMR) were used to identify high risk patients. Clinical Research Specialist (CRS) in partnership with Primary Care Team administers a pre-intervention survey, delivers stroke education, assesses retention by quarterly phone calls with plans for a 12-month post-intervention survey.
Results: High ASCVD score was identified in 758 (Intervention) and 1128 (Control) patients. 35 Intervention and 35 control patients are enrolled. Time spent in consenting patients and delivering education is 5 minutes with additional 10-15 minutes at each 3-month follow-up call. 28 patients have completed 3 month follow up. Intervention vs. Control; Age (Median 75 vs. 73 years); ASCVD score (26 vs.27.65). Education retention rates of (10/35 28.6%) for stroke signs/ symptoms and (7/35 20%) for at least 3 risk factors at 3 months. 21 (60%) patients adopted healthy lifestyle at 3-month follow up. Total study cost is 130,000$ over 18 months.
Conclusions: Primary Care – Vascular Neurology partnership to modify stroke incidence and healthcare seeking behavior is feasible and cost effective.
Disclosure of interest: No

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Sensorineural hearing loss in stroke: an age matched case-control study

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Background and aims: Sensorineural hearing loss (SNHL) is common in the elderly and can impact on recovery from stroke and may be important in stroke aetiology. The purpose of this case-control study was to compare baseline characteristics between cohorts of an elderly stroke population both with and without SNHL, to assess differences in aetiological factors and their impact on outcome.
Methods: We performed a case-control study including acute ischaemic stroke admissions at our regional stroke service in 2017. We compared one cohort who had SNHL diagnosed by otolaryngologists to another group derived from an age-matched control cohort who had stroke without hearing deficit. Baseline characteristics including age, gender, vascular risk factors and disability as measured by modified Rankin Score (mRS) were compared. Logistic regression was performed with 3-month mortality as dependent variable.
Results: We reviewed 631 stroke admissions, 305 had SNHL (mean age 79 years). Admission disability (mRS) was higher in the cohort with SNHL (p=<0.001); however, there was no difference in 3-month mortality 61 (18.7%) versus 67 (22.0%) in SNHL (p=0.310). The factors associated with mortality were age (p<0.001), and Atrial fibrillation (p=0.03). Hypertension (p=0.005), previous stroke (p=0.017) and aetiology by TOAST classification small vessel disease were associated with SNHL.
Conclusions: SNHL appears to have an association with stroke of small vessel disease aetiology, although it does not affect 3-month mortality following stroke. There is an association between SNHL and increased disability in this study. A potential small vessel ischaemic basis of SNHL should not be overlooked.
Disclosure of interest: No

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The use of electronic health record to identify major health trajectory leading to stoke

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Background and aims: Stroke often arises in the context of critical life course health trajectories (LCHTs) defined by various sequences of multiple long term condition (LTCs). In order to define a typology of stroke and myocardial infarction (MI) in terms of LCHTs, we analysed patients' electronic health records (EHR), and evaluate associations with sociodemographics and other risk factors.
Methods: Comprehensive EHR of patients with stroke and/or MI aged over 18, registered in 41 south London general practices between April 2005 and April 2021 were analysed using Multiple State Analysis.
Results: 28 LTCs were considered (table.1). Of 856,342 registered patients, 9629 (1.1%) had a record of stroke. 42% were female and median age at onset was 64 years. A typology of 14 critical LCHTs, further divided in two main groups was defined. Briefly, the first group (75%) shows LCHTs including mainly records of stroke-related LTCs such as hypertension (70%) or diabetes (35%), in older age patients at onset (median: 66 years). In the second group however, hypertension was less prevalent (41%) and atypical LCHTs emerged, characterised by mental and neurological conditions, asthma and states of multi-morbidity in a younger population (median: 42 years) and otherwise characterized by ethnic and gender disparities (fig.1).
Conclusions: We propose in this comprehensive analysis of patients' EHR a typology of LCHTs leading to stroke. This typology allows to better characterise expected and atypical LCHTs leading to stroke, and therefore deepen our understanding of stroke causation and outcomes, to better inform prevention, treatment and health service design.

Cancers and neoplasms	Any cancer and neoplasm (1)
Cardiovascular diseases	Stroke (2), Heart failure (3), Peripheral vascular disease (4), Atrial fibrillation (5), Hypertension (6), Myocardial infarction (7), Coronary heart disease (8) and Transient ischaemic attack (9)
Infectious diseases	viral hepatitis B & C (10)
Inflammatory diseases / Diseases of the immune system	Rheumatoid arthritis (11) and Inflammatory bowel disease (IBD) (12)
Kidney diseases	chronic kidney disease grade 3 to 5 (CKD 3-5) (13)
Liver diseases	Non-malignant liver diseases (14)
Mental health conditions	Anxiety disorders (15), Depression (16), Other serious mental illness (17)
Substance dependency	Alcohol dependence (18) and Other substance dependency (19)
Metabolic / endocrine diseases	Diabetes (20) and Morbid obesity (21)
Musculoskeletal conditions	Osteoarthritis (22) and Osteoporosis (23))
Neurological conditions	Parkinson's (24), Epilepsy (25) and Dementia (26)
Respiratory diseases	Asthma (27) and COPD (28)

Table 1: List of analysed long term conditions

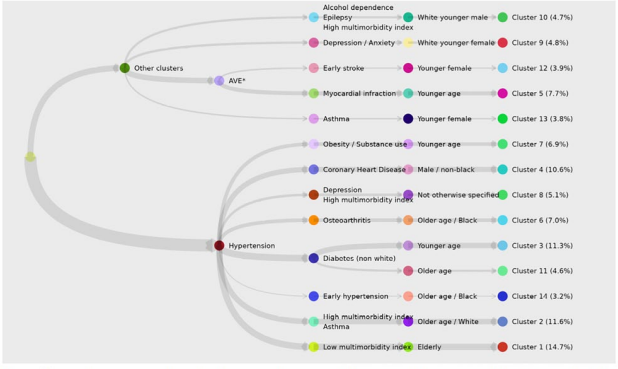

Figure 1: typology annotation: the hypertension group (first group) is composed by clusters 1-4, 6-8, 11, 13 and 14, and the second group (other clusters) is composed by clusters 5, 9, 10, 12 and 13.

Disclosure of interest: No

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Incidence and outcome of cerebral venous thrombosis in Germany- results from the population-based Erlangen Stroke Project

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Background and aims: Data on epidemiology of cerebral venous thrombosis (CVT) is scarce. We investigated incidence rates and outcome after CVT from 1996-2020 within a population-based stroke register in Germany.
Methods: Data was collected within the Erlangen Stroke Project, a prospective, population-based stroke register covering a population of 105,164 inhabitants (2010). 5-year time intervals were combined to calculate the crude and age-standardized incidence rates from 1996 to 2020. Incidence rates were age-standardized to the German standard population of 2011 by the direct method. Survival probabilities up to 5 years after the index event were estimated using Kaplan-Meier procedure.
Results: 33 patients with CVT were reported from 1996 to 2020; 21 (64%) were female, in median (IQR) 46.0 (33.0–72.0) old, women 39.0 (29.0–50.0) years old and men 72.5 (65.8-75.5) years old. Age-standardized incidence per 1 million was 12.67 (95%-CI: 8.64-18.03); age-standardized incidence slightly increased from 8.11 (2.07-22.71) in 1996-1999 to 17.90 (8.38-34.41) in 2016-2020. 10 (30%) patients died during the observation period, 1-month and 5-year survival probabilities were 82% (69.7-96.1) and 66% (50.6-86.2), respectively.
Conclusions: Overall incidence of CVT was low in our sample, but might have increased over time. Especially young females were affected.
Disclosure of interest: No

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Predictors of Dementia and Cognitive Impairment After Stroke - A Systematic Review and Meta-Analysis

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Background and aims: Cognitive impairment and dementia are highly prevalent among stroke survivors and represent a major burden for patients, carers, and healthcare systems. We aimed to elucidate the risk factor profile of post-stroke cognitive impairment (PSCI) and dementia (PSD) beyond age and stroke severity.
Methods: We performed a systematic literature search and selected cohort studies of patients with acute stroke that explored associations between baseline-assessed risk factors and PSCI or PSD over a follow-up period of at least 3 months. Study quality was assessed using the Newcastle Ottawa Scale. We calculated pooled Risk Ratios with random-effects meta-analyses and performed subgroup, meta-regression, and sensitivity analyses to test the robustness of the results.
Results: A total of 113 articles (89 cohorts, 160,783 patients) were eligible for quantitative synthesis. We identified diabetes, atrial fibrillation, white matter hyperintensity (WMH) severity, and lacune presence as the most robust potentially modifiable risk factors for PSCI and PSD beyond age and stroke severity. Also, we identified the following non-modifiable risk factors: low educational attainment, prior stroke, left hemisphere stroke, baseline cognitive impairment, and baseline functional status. We found substantial inter-study heterogeneity and evidence of publication bias, which might in part relate to a tendency of lower quality studies to report larger effect sizes.
Conclusions: Our results extend the evidence on the risk factor profile of PSCI and PSD. We identified diabetes, atrial fibrillation, and cSVD-markers, such as WMH or lacunes, as the most auspicious modifiable targets for prevention of cognitive impairment and dementia after stroke.
Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

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INFLUENCE OF SOCIOECONOMIC STATUS ON FUNCTIONAL OUTCOME AFTER STROKE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and aims: To systematically examine contemporary evidence of associations between socioeconomic status (SES) and functional outcome after stroke.
Methods: A systematic literature search across Medline and Embase from January 1, 2010 to June 1, 2022 to identify observational studies (n≥100 and in English). Risk of bias was assessed using Newcastle Ottawa Scale. Where possible, data were pooled for meta-analysis with Odds ratios (OR) and 95% confidence intervals (CI) by random effects meta-analysis.
Results: We included 17 studies (n=155,209) reporting functional outcome measured with modified Rankin Scale or Barthel index, with 8 assessed as high quality. SES data (education/11 studies, income/8, employment/3, health insurance status/3, and area deprivation index/3 as proxies for SES) varied across studies and countries. Pooled data suggested that lower SES, including education (incomplete/ below high school vs high school or above: OR [95%CI]: 1.83 [1.34, 2.52]), employment (manual/ unemployed vs non-manual/ employed: 1.61 [1.26, 2.07]), and neighbourhood socioeconomic status (most disadvantaged vs least disadvantaged: 1.55 [1.25, 1.92]) were significantly associated with functional dependency after stroke. Income 1.23 [0.96, 1.27] and health insurance status 1.32 [0.95, 1.84] were also associated with an increased risk of functional impairment, although not statistically significant. There was significant heterogeneity in pooled analyses. Limited data was found on how sex, age, or stroke subtype modified the associations.
Conclusions: Education, employment and neighbourhood socioeconomic status were significantly associated with functional outcome post stroke. Further research is needed to better understand causal mechanisms and disparities.
Review registration number: PROSPERO CRD42021281134
Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

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IMPACT OF A NATIONAL INFORMATION CAMPAIGN ON PUBLIC AWARENESS OF STROKE RISK FACTORS AND PUBLIC RESPONSE TO STROKE SYMPTOMS

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Background and aims: Public information campaigns such as ACT FAST have been shown to improve public awareness of stroke-like symptoms although their impact reduce over time. We aimed to compare results of a recent FAST campaign in Ireland to an earlier campaign over a decade earlier.

Methods: A FAST campaign comprising three waves of advertising on television and radio between May 2010 and June 2011 was compared with a 2020 campaign involving three parallel streams of stroke awareness promotion run over a three week period in November 2020: radio and online campaign highlighting the "Minutes Matter" message; a public relations campaign on regional and national media outlets promoted the FAST message; community engagement events attended by stroke survivors. Comparative statistics were used to analyse survey data carried out before and after both public awareness campaigns.

Results: Both FAST campaigns led to a significant increase in respondents (n~1000) reporting that they would first call an ambulance if they thought they were having a stroke from 55% (558/1016) to 61% (631/1028) post-campaign in the 2021 survey and from 47% pre to 57% post-campaign in the 2011 survey. Of those who were aware of the 2020 campaign, 10% had seen it on television and 2% through social media.

Conclusions: Campaigns in stroke promotion can improve population awareness however sustained messaging through appropriate media channels is required to maintain awareness. Social media, not used in the 2010/2011 campaign, may offer additional opportunities to reach a broad audience and an opportunity for targeted messaging.

Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

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GENDER DIFFERENCES IN PRIMARY PREVENTION, RISK FACTORS AND OUTCOMES IN STROKE PATIENTS BASED ON THE RES-Q REGISTRY

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Background and aims: The RES-Q (Registry of Stroke Care Quality) is the only registry in the Republic of Moldova that provides information about the in-hospital stroke care indicators. The aim of our study was to compare the risk factors, drugs used for primary prevention, and outcomes of stroke in men and women.

Methods: Data were collected for 1 month, during March 2022, by 15 participating hospitals distributed throughout the country. Each hospital enrolled at least 30 consecutive patients with acute stroke. Collected data were registered online in the RES-Q project form. Statistical analysis included SPSS and the ANOVA methodology.

Results: Our study included 550 patients with the mean age 69 ± 9 years, 47.8% men. Women developed stroke at an older age (72.2 vs 65.6, $p<0.01$). There were no significant gender differences in major stroke risk factors, nevertheless atrial fibrillation (AF) (28.6% vs 20.9%, $p>0.05$) and congestive heart failure (32.4% vs 26%, $p>0.05$) were more frequent in women, while smoking was more common in men (25.5% vs 3.1%, $p>0.05$). Drugs used for primary stroke prevention included: antihypertensives (74%), antiplatelets (49%), antidiabetics (19%), anticoagulants for AF (4.9%) and statins (7.1%), without differences between groups. Women had higher mRs (3.49 vs 2.92, $p<0.05$) and NIHSS (8.26 vs 8.09, $p>0.05$) scores at discharge.

Conclusions: Women developed stroke at an older age and presented a higher neurological disability at discharge. As well we revealed serious gaps in primary stroke prevention in both genders, which indicates the necessity to improve its management at a primary medicine level.

Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

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Neighborhood Deprivation and Race Synergistically Contribute to Undiagnosed Hypertension Leading to Acute Ischemic Stroke: Results from the All of Us Research Program

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Background and aims: Neighborhood deprivation is a major social determinant of health associated with lower access to healthcare. We hypothesize that hypertension goes undiagnosed more frequently in deprived neighborhoods and in people from Black race. We also hypothesize that undiagnosed hypertension (uHTN) associates with higher odds of ischemic stroke (AIS).

Methods: We conducted a longitudinal study analyzing participants from the All of Us Program (AoU). We identified people who met the criteria for hypertension based on blood pressure values obtained at enrollment but were not hypertensive according to past EHR or survey data. We evaluated deprivation using the Deprivation Index (DI), an aggregate variable derived from six American Community Survey metrics. We used multivariable logistic regression to test for interaction between race and DI tertiles in a model predicting uHTN adjusting for age, sex, income, and education.

Results: Of the 269,063 AoU participants with appropriate data available, 6,690(2.5%) had an AIS. Compared to low deprivation, intermediate and high deprivation were associated with 15%(OR:1.15;95%CI:1.12-1.19) and 35%(OR:1.35;95%CI:1.31-1.39) higher odds of uHTN (test-for-trend $p<0.001$). Compared to White participants, Black participants had 35%(OR:1.35;95%CI:1.31-1.39;$p<0.001$) higher uHTN odds. There was a significant synergy between DI and race (interaction $p<0.001$): compared to White participants living in low-deprivation areas, Black participants living in high-deprivation neighborhoods had 91%(OR:1.91;95%CI:1.82-1.99;$p<0.001$) increased uHTN odds. In addition, uHTN was associated with 22%(OR:1.22;95%CI:1.01-1.48;p=0.04) increased odds of incident AIS when accounting for prevalent hypertension.

Conclusions: High neighborhood deprivation and Black race are associated with a higher risk of undiagnosed hypertension, and these effects are synergistic.
Disclosure of interest: No

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CLINICAL AND IMAGING OUTCOMES FOR PATIENTS WITH WITNESSED STROKE ONSET VS LAST SEEN WELL

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Background and aims: Unwitnessed onset stroke patients are less likely to receive reperfusion therapies than witnessed patients. We investigated the baseline characteristics, treatment utilization and outcomes in witnessed vs. unwitnessed strokes.
Methods: In the prospective INTERRSeCT study, baseline and follow-up data were compared for witnessed vs. unwitnessed patients. The last known well time was used for unwitnessed onsets. Imaging parameters were collected at baseline and follow up.
Results: Of 641 patients, 448 (70 %) had a witnessed onset vs. 193 (30 %) with unwitnessed stroke. Baseline characteristics, treatment, and outcomes are summarized in the table. Unwitnessed patients were older, more often females, and with higher stroke severity. Despite significant longer times from onset to imaging time and lower intravenous alteplase use in unwitnessed patients, outcomes were similar.
Conclusions: Unwitnessed strokes affected the vulnerable groups in our study. In the modern era, patients should not be denied reperfusion therapies based on witnessed vs. unwitnessed stroke onset.

Parameters	**Witnessed (n=448)**	**Unwitnessed (n=193)**
Baseline Median Age (IQR)	70 (22)	72(16)
Females	48%	51%
Median ASPECTS (IQR)	9 (2)	8 (2)
Mean onset/LSN to CT-min (SD)	111 (59)	267 (198)*
Median NIHSS (IQR)	14 (8, 19)	15 (9,20)
Treatment Alteplase %	52	40**
EVT (+/- alteplase) % Outcome	40	41
24 Hours Median NIHSS	5 (1,14)	7 (3,16)
Median Infarct Volume- ml	17.14 (4.63, 56.35)	22.85 (7.84, 55.89)
90-day mRS	2 (1,4)	2 (1,4)

* T-test p-value 0.0001, ** Chi Square p-value 0.005.

Disclosure of interest: No

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RELEVANCE OF BODY MASS INDEX-DEPENDENT GRADIENTS OF SERIC URIC ACID LEVELS FOR STROKE PREDICTION IN APPARENTLY HEALTHY INDIVIDUALS

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Background and aims: Serum uric acid (SUA) is associated with many cardiovascular risk factors, atherosclerosis, and risk of stroke. Here, we aimed to investigate the effects of SUA levels on markers of carotid atherosclerosis and risk of ischemic stroke across the body mass index (BMI) classes in apparently healthy individuals.
Methods: Included subjects were examined according to a pre-established protocol of stroke risk factors' estimation, which included a questionnaire, clinical and laboratory examination, and Doppler ultrasound of carotid arteries.
Results: In this study 2076 apparently healthy subjects (mean age 48.1±13.1 years; 1307 women) and 127 stroke patients (63.8±11.4 years; 48 women) were included. Hyperuricemia was identified in 123 (5.9%) subjects, more frequently in females ($\chi 2=12.7$, $p<0.001$). Subjects with hyperuricemia showed more frequently increased intima media thickens (IMT) ($\chi 2=6.6$, $p<0.01$). A gradient in increasing levels of SUA was observed across BMI categories ($F=72.1$, $p<0.001$). Following ROC analysis, SUA levels yielded an AUC of 0.60 (95% CI 0.54-0.64) in discriminating patients with normal/abnormal IMT, yet with the highest accuracy in overweighed subjects 0.65 (95% CI 0.56-0.74). Levels of SUA yielded an AUC of 0.61 (95% CI 0.58–0.64) in discriminating subjects with/without plaques, yet with the highest accuracy in overweighed 0.63 (95% CI 0.58–0.68). Increasing levels of SUA were associated with an increased risk of having stroke, especially in those overweighed (OR 1.01, 95% CI 1.003-1.007).
Conclusions: Levels of SUA were associated with increased risk of abnormal IMT, carotid plaques, and stroke in apparently healthy individuals, particularly in those overweighed.
Disclosure of interest: No

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POOR 1-YEAR OUTCOME FOLLOWING STROKE IN MONGOLIA: A PROSPECTIVE POPULATION-BASED STUDY IN ULAANBAATAR

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Background and aims: In the absence of reliable data to quantify the burden of stroke, we undertook a prospective population-based study to determine hospital management and 1-year outcomes for patients with acute stroke in Ulaanbaatar, Mongolia.

Methods: All cases of stroke were identified through surveillance of multiple overlapping sources of hospitalised, ambulatory and deceased cases, using standardised diagnostic criteria in adult (age ⩾16 years) residents of 6 urban districts of Ulaanbaatar (population person-years, N=1,896,965) between 1 January 2019 and 31 December 2020. Data of clinical characteristics, hospital management and 1-year functional recovery (mRS) were collected.

Results: Among a total of 3803 strokes, 2962 were first-ever incident cases (mean age 59±13 yrs, female 39.2%). Median time from stroke onset to first CT was 10 (IQR 2.5-36.0) hours, and was longest for ischaemic stroke (16.0 [3.0-48.0]). Patients with intracerebral haemorrhage had greater severity (median NIHSS 11 [5-21]) at admission compared to ischaemic stroke and subarachnoid haemorrhage. Only 0.9% of ischaemic stroke patients received thrombolysis and 12.3% intracerebral haemorrhage received surgery treatment. The rate of death or disability at one-year was 61.6% (95%CI 59.8-63.4), with highest in ICH (77.0 [74.5-79.5]), followed by subarachnoid haemorrhage 61.8 (57.0-66.5) and ischaemic stroke 47.5 (44.7-50.3).

Conclusions: Patients with stroke in Mongolia present with a long time to diagnosis, have low access to standard treatment, and poor outcome.

Disclosure of interest: No

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ARE ASSOCIATIONS BETWEEN SOCIOECONOMIC STATUS AND SMALL VESSEL DISEASE INDEPENDENT OF VASCULAR RISK FACTORS IN MINOR STROKE?

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Background and aims: Low socioeconomic status is associated with higher SVD burden in community samples. Less is known about this relationship in people with stroke. We aimed to clarify associations between socioeconomic status and SVD in patients with mild stroke, and determine whether they are independent of vascular risk factors.

Methods: We prospectively recruited patients with mild ischaemic stroke, performed MRI within 3-months and assessed presence of SVD features, WMH volume and brain volumes. We measured neighbourhood deprivation using the Scottish Index of Multiple Deprivation (SIMD) (lower score=greater deprivation, median SIMD quintile=3), and socioeconomic status using age leaving education. We used logistic and linear models adjusted for age, sex, hypertension, diabetes and smoking.

Results: We recruited 230 participants (mean age 65.85 years, 33.5% female, 56.8% lacunar, 43.2% cortical stroke). Mean age leaving education was 16.9 years. Median SIMD quintile in lacunar stroke was 3 (IQR 2-4.25) and in cortical stroke was 4 (IQR 3-5) (χ^2=7.87, p=0.01). SIMD was associated with lacunar stroke independent of vascular risk factors (vs cortical stroke OR=0.73, 95%CI=0.59-0.90, p=0.003). SIMD was not associated with other SVD markers. There were trends for longer education and lower Fazekas WMH (OR=0.93 95%CI=0.86-1.01, p=0.08), lower WMH volume (β=-0.08, SE=0.01, p=0.05) and fewer microbleeds (OR=0.93, 95%CI=0.85-1.01, p=0.09).

Conclusions: People with lacunar stroke are more likely to live in deprived areas, independent of vascular risk factors. It is unclear whether socioeconomic status is associated with SVD burden following minor stroke. Future work, with larger sample sizes, is required to confirm these findings.

Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

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CORMORAN STUDY (CEREBRAL VENOUS THROMBOSIS HORMONAL CONTRACEPTIVES). HORMONAL CONTRACEPTIVE-ASSOCIATED CEREBRAL VENOUS THROMBOSIS: A MULTI-CENTRE CASE-CONTROL STUDY

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Background and aims: Hormonal contraceptives (HC) represent a risk factor for cerebral venous thrombosis (CVT). The objective of our study is to identify association between CVT and different types of HC and to determine if there are any individual factors associated with a higher CVT risk.

Methods: Retrospective multicentre case-control study. Cases were selected among women with CVT and receiving HC in 11 centres in Spain during the period 2008-2021. Controls were healthy women on HC from one health centre. HC were classified according to composition, progestin component and oestrogen dose.

Results: 155 patients were included. 59 cases: median age 32 years (24-41), 37.3% smokers. In 41/59(69%) HC type and dose was identified. 96 controls: median age 25 years (23-27), 14.6% smokers. An association was found between CVT and increasing age especially >28.5 years [AUC 0.72;95%;CI 0.626-0.819;p<0.001] with OR=21.88(95%CI 8.20-58.05;p<0.001). Smoking was a risk factor OR=3.48(95%CI 1.60-7.55, p=0.002). Related to the type of HC, progesterone derivatives HC OR=114.55(95%CI 13.94-941.56) and 0.020 mg ethinylestradiol dose OR=2.77(95%CI 1.19-6.42) showed association with higher CVT risk. A lower CTV risk was found in doses of ethinylestradiol 0,035 mg OR=0.12(95%CI 0.02-0.064; p=0.013) and second-generation testosterone derivatives OR=0.21(95%CI 0.10-0.47).

Conclusions: In our study, in women taking HC, smoking and older age were more frequent in the CVT group and might be risk factors. Regarding the type of HC, results point at progesterone derivatives and 0,020 mg

ethinylestradiol as possible risk factors, whereas a 0,035 mg dose of ethinylestradiol and second-generation testosterone derivatives could be protective.
Disclosure of interest: No

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COVID-19 PANDEMIC IMPACT ON STROKE MANAGEMENT IN TRIESTE: A LOOK IN 2020, 2021 AND 2022 EMERGENCY EVOLUTION

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Background and aims: COVID-19 pandemic has been the most impactful health event of last century. Most of worldwide studies have focused on the pandemic consequences on Stroke management during first infection wave (spring 2020), even if in Italy emergency measures lasted until March 31st, 2022. We have aimed to expand the investigation to the whole pandemic period.
Methods: We selected all patients admitted to Trieste Stroke Unit from January 1st, 2018 until June 30st, 2022. We divided them into six groups according to COVID government restriction measures: pre-COVID phase, 1st COVID-wave, phase of easing measures, 2nd COVID-wave, "green-pass" phase, post-emergency phase. Endpoints were admission, outcomes (mRS and NIHSS scores) and treatments at various stages.
Results: We collected 1521 patients (mean age ±74), 667 thrombolysis and 213 thrombectomies. Patients hospitalized per day reached the minimum during most restrictive measures (0,75 in 1st and 0,77 in 2nd wave vs. 0,97-0,98 in pre-/post-emergency). NIHSS scores at admission were higher during 1st wave (58% of patients with NIHSS>5) with a rebound in the immediately next phase (36% of patients with NIHSS>5) and a gradual return to normality in the following stages. Treatment performance remained the same throughout the period.
Conclusions: The COVID-19 pandemic changed Stroke management far beyond 2020: after a first decrease in admission (especially for minor stroke patients), in the following phases we showed a gradual recovery to a classical contest even if the pre-emergency situation is still returning. Nevertheless, neurological emergency treatment was preserved all over the pandemic.
Disclosure of interest: No

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SLEEP-DISORDERED BREATHING IN ACUTE STROKE: A SINGLE-CENTER, PROSPECTIVE, LONGITUDINAL STUDY

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Background and aims: Sleep-disordered breathing (SDB) is common among acute stroke patients. We sought to investigate the prevalence, severity and type of SDB in acute stroke, to identify independent predictors of SDB in acute setting and to investigate potential associations between SDB and functional outcomes at three months.
Methods: We prospectively studied stroke patients, who underwent overnight polysomnography within 72 hours from symptom onset. Demographics, clinical and imaging characteristics were documented. Daytime sleepiness preceding the stroke, stroke severity on admission and functional outcome at three months were evaluated. SDB was documented using standard polysomnography criteria.
Results: 130 consecutive acute stroke patients were prospectively evaluated [110 with ischemia, 20 with hemorrhage, mean-age 60.5±10.9 years, 77% men, median NIHSS-score on admission:3 (IQR:2–17)]. The SDB-detection rate on polysomnography recordings was 79% (95%CI:71–86). Three variables were independently associated with the likelihood of SDB detection in multivariable analyses adjusting for potential confounders: age (OR per 10-year-increase:2.318, 95%CI:1.327–4.391, p=0.005), male sex (OR:7.901, 95%CI:2.349–30.855, p=0.001) and abnormal ESS-score (OR:6.064, 95%CI:1.560–32.283, p=0.017). Among patients with SDB, congestive heart failure was independently associated with the likelihood of central apnea (OR:18.295, 95%CI:4.464–19.105, p<0.001). Among all patients, increasing NIHSS-score on admission (OR:0.817, 95%CI:0.737-0.891, p<0.001) and Apnea-Hypopnea-Index (OR:0.979, 95%CI:0.962–0.996, p=0.020) emerged as independent predictors of excellent functional outcome at 3 months (mRS-scores 0-1).
Conclusions: The high prevalence and severity of SDB in acute stroke and its negative impact on functional outcome indicate the importance of polysomnography implementation in everyday clinical practice of acute stroke management.
Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

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High fibrinogen and low antithrombin are associated with an increased risk of recurrent cardiovascular events in young ischemic stroke patients

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Background and aims: Patients with ischemic stroke at young age (18-50 years) are at increased risk of recurrent cardiovascular events, despite antithrombotic treatment. Enhanced coagulation parameters is linked to an increased risk of venous thromboembolism but may also predict recurrent atherothrombotic events. The aim of this study is to determine the association between coagulation parameters and risk of recurrent ischemic arterial events after a first-ever ischemic stroke or transient ischemic attack (TIA) in young patients.
Methods: We included patients with first-ever TIA or ischemic stroke between 1980 and 2010 from the prospective FUTURE cohort.

Coagulation parameters (factor VIII, d-dimer, fibrinogen, antithrombin, and prothrombin) and thrombin generation (TG) using 1pM and 5pM tissue factor, and thrombomodulin were measured in platelet-poor plasma collected in 2010. Primary outcome was recurrent ischemic arterial event between 2010-2023. We applied Cox proportional hazard models to estimate hazard ratios (HR).

Results: Among 327 included patients (median age 42.1 years, 56% women), 69 patients experienced a recurrence (mean follow-up of 6.4 years). In univariate analyses, only antithrombin (HR=0.86, 95% CI=0.77-0.96) and fibrinogen (HR=1.45, 95% CI=1.04-2.02) were associated with recurrence. After correction for potential confounding, the association with antithrombin remained (HR=0.80, 95% CI=0.70-0.91), whereas the association with fibrinogen slightly diminished (HR=1.40, 95% CI=0.95-2.06).

Conclusions: In this study, a 10% increase of antithrombin activity was associated with a reduced risk of recurrent ischemic arterial event after ischemic stroke or TIA at a young age, whereas fibrinogen seemed to be associated with an increased risk.

Table 1. Adjusted hazard ratios of recurrent ischemic arterial events for different coagulation parameters.

	No recurrence (N=261)	Recurrence (N=66)	Units of increase	Adjusted hazard ratio's (95% CI)
D-dimer	0.29 (0.22-0.36)	0.31 (0.22-0.49)	1 µg/mL	1.06 (0.49-2.27)
Fibrinogen	3.3 (2.8-3.8)	3.6 (2.9-4.1)	1 µg/ml	1.40 (0.95-2.06)
Prothrombin activity	102.0 (92.7-113.3)	99.5 (93.2-107.6)	10%	0.99 (0.94-1.05)
Antithrombin activity	105.3 (99.6-111.9)	102.9 (96.7-108.7)	10%	0.80 (0.70-0.91)
Factor VIII activity	152.0 (125.4-191.8)	157.0 (125.0-217.7)	10%	1.01 (0.97-1.06)
Thrombin generation				
Lagtime				
1pm TF	5.0 (4.6-6.0)	5.2 (4.7-6.0)	1 min	1.08 (0.91-1.28)
5pm TF	3.2 (2.9-3.7)	3.3 (3.0-3.7)	1 min	1.07 (0.79-1.46)
ETP				
1pm TF	1270.3 (1125.1-1444.8)	1300.1 (1088.1-1432.2)	100 nm*min	0.98 (0.90-1.06)
5pm TF	1248.2 (1120.0-1432.3)	1292.4 (1056.0-1410.2)	100 nm*min	0.98 (0.89-1.07)
TM (% inhibition)	*38.9% (26.5%-50.8%)*	*35.6% (26.6%-48.7%)*	10%	0.93 (0.80-1.07)
Peak				
1pm TF	259.7 (208.7-313.2)	258.9 (205.4-308.5)	10 nM	0.99 (0.96-1.03)
5pm TF	244.7 (205.1-298.6)	253.7 (211.8-294.0)	10 nM	1.00 (0.96-1.04)
TM (% inhibition)	23.6% (13.2%-33.7%)	21.2% (13.9%-34.0%)	10%	1.00 (0.97-1.04)

Data is presented as median with 25th and 75th percentile.
ETP: endogenous thrombin potential, TF: tissue factor, TM: thrombomodulin

Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

1725

Historical review of the effectiveness of direct-acting anticoagulants in stroke due to atrial fibrillation

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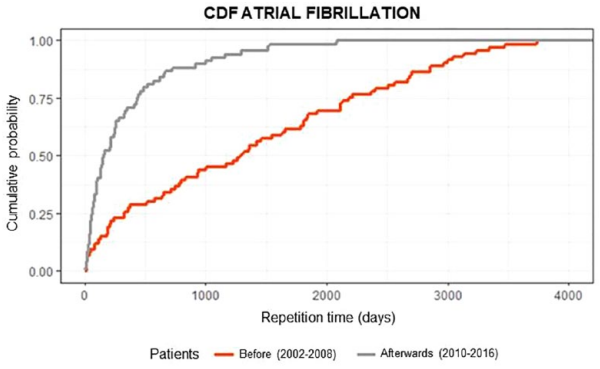
Background and aims: Analysis of large amounts of electronic medical records. The aim is to assess the incidence and recurrence of ischemic stroke in relation to atrial fibrillation (AF) and the impact of the introduction of new anticoagulants.

Methods: Record of 14,808 patients between January 1994 and September 2018, where 2,014 presented recurrence. Two periods were defined: 2002 to 2008 and 2010 to 2016. In the intermediate period, they demonstrated efficacy and safety, and the use of dabigatran (2009 end), rivaroxaban (2011) and apixaban (2011) were recommended.

Results: In the period between 2002 and 2008, 5,237 strokes were recorded and 16.04% were recurrent. In the second period, 5,781 strokes were recorded and 10.72% recurrent. The following graph represents the time of stroke recurrence in patients in the two defined periods. See image CDF (Cumulative Distribution Function).

The recurrence of stroke due to AF between 2010-2016 (60 recurrences of 1,025 strokes) was reduced compared to the first period (71 recurrences of 778 strokes) have likely been treated with this line of treatment, it is superior to the patients of the period 2002-2008.

Conclusions: The percentage of patients who had a recurrence after the period of implementation of these treatments is considerably reduced (33.16%). Additionally, it can be seen in the graph that the time of stroke recurrence is longer for patients in the first period, where these treatments did not yet exist, and recurrence decreased by 35.07%.



Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

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RATES OF ISCHEMIC STROKE MIMICS RECEIVING THROMBOLYSIS AND ASSOCIATIONS WITH OUTCOMES WITHIN THE NATIONAL READMISSION DATABASE (2017-2020)

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Background and aims: There are potential trade-offs between diagnostic certainty and time-to-treatment in managing acute ischemic stroke (AIS) which can then impact outcome. We examined associations between stroke mimic proportions at treating hospitals with patient outcomes after IV thrombolysis in the National Inpatient Sample (NIS).

Methods: Using the 2017-2020 NIS, we identified discharges with use of IV thrombolysis AND a documented NIHSS. Mimics were identified as discharges without diagnosis codes associated with AIS, cerebral ischemia or TIA. Effects of temporality and hospital characteristics on proportion of mimics among patients receiving thrombolysis were examined using Chi-squares. Logistic regression was used to examine associations between proportion of mimics at treating hospitals and (1) in-hospital mortality and (2) discharge home.

Results: 9125/159050 (5.7%) discharges with documented NIHSS receiving thrombolysis were stroke mimics (Table 1). The most common principal discharge diagnoses among mimics were: migraine (16%), functional

neurological illness (8.6%) and hemiplegia (7.2%). The proportions of mimics were higher at teaching hospitals (5.9% vs. 5.1%, p=0.037) with no effect of seasonality (i.e. July effect) or weekend admission. A higher proportion of mimics had no association with inpatient mortality but was associated with increased odds of discharge home (OR 2.16, 95%CI 1.75-3.44) for non-mimics which remained significant after adjustment for age, sex, NIHSS and hospital thrombolysis volume.

Conclusions: Patients with strokes treated with IV thrombolysis at hospitals with a higher proportion of mimics had no difference in inpatient mortality and higher odds of discharge home.

Table 1	Non-mimics	Mimic	p-value
Total N=159,050	N=149,925	N= 9,125	
Age	68.2 (0.09)	57.9 (0.38)	<0.001
Female sex	49.0%	60.2%	<0.001
NIHSS	9.09 (0.5)	7.6 (1.5)	<0.001
Teaching hospital			0.037
Non-teaching	19.2%	17.1%	
Teaching hospital	80.8%	82.9%	
Outcomes			
Length of Stay (days)	5.03 (0.04)	4.12 (0.14)	<0.001
In-hospital mortality	4.1%	2.6%	0.003
Intracranial hemorrhage	9.7%	8.1%	0.036
Patient discharged home	41.6%	61.3%	<0.001

Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

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A SYSTEMATIC REVIEW AND META-ANALYSIS OF THE PREVALENCE OF MULTIMORBIDITY IN GENERAL POPULATION IN CHINA

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Background and aims: Multimorbidity is a major challenge for the health system in China, which faces unprecedented aging of its population. To examine the prevalence and trends in multimorbidity among Chinese adults since 1998.

Methods: Studies regarding the prevalence of multimorbidity in Chinese people published since 1998 were searched in databases of CNKI, Wanfang, and PubMed, and so on. Meta-analysis was performed to calculate the pooled prevalence of multimorbidity based on random effects. Subgroup or Meta-regression analysis was conducted

Results: A total of 123 papers were included in the analysis, with 7 714 313 participants. The pooled prevalence of multimorbidity in Chinese people was 36.3% (95%CI:32.8%-39.9%). The pooled prevalence was higher in urban than in rural Chinese, and higher in women (36.2%, 95% CI:33.8%-38.5%) than men (33.2%, 95%CI:30.9% -35.5%). Before 2004, the average prevalence showed 14.5%, with an annual increase rate of around 1.3%. Since 2014, the prevalence of multimorbidity was significantly higher than before ($P<0.001$). Age group difference was also found ($P<0.001$), where the prevalence of multimorbidity for Chinese aged 60-79 years old was 38.1% (95%CI: 34.6% ~ 41.5%), followed by those aged 80 years and older, 40-59 years old, and younger than 40 years old.

Conclusions: The prevalence of multimorbidity in Chinese has been rapidly increasing since 2014 and is higher in those aged 60 to 80 years than in other age groups. Efforts and preventive strategies should be adopted for early screening of multimorbidity in high-risk groups.

Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

2009

Association of high-sensitivity cardiac Troponin T with cardiovascular events after ischemic stroke or transient ischemic attack

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Background and aims: High-sensitivity cardiac troponin T (hs-cTnT), a biomarker of cardiac injury, has been associated with cardiovascular disease (CVD) events in the general and various high-risk populations. We aimed to determine whether this increased risk also applies to patients with prior ischaemic stroke or transient ischaemic attack (TIA).

Methods: We analysed data from the STROKE-CARD trial (NCT02156778), a randomised controlled trial of a disease management programme in patients with acute ischemic stroke or high-risk transient ischaemic attack. Baseline hs-cTnT and relevant covariates were measured before hospital discharge (n=1611). Using Cox regression, we estimated hazard ratios for a composite CVD outcome defined as nonfatal ischaemic or haemorrhagic stroke, nonfatal myocardial infarction, or vascular death.

Results: Median hs-cTnT was 11.3 ng/L (interquartile range 6.6-19.9). Over a median follow-up of 12.1 months, 105 CVD events occurred. We observed positive associations of log-linear shape between baseline hs-cTnT and CVD risk. In a model adjusted for conventional CVD risk factors, the hazard ratio for CVD per 1-SD higher log hs-cTnT was 1.42 (95%CI: 1.17-1.73, $P<0.001$). The association did not materially change upon further adjustment for log N-terminal pro–B-type natriuretic peptide, estimated glomerular filtration rate, or log high-sensitivity C-reactive protein. Findings were consistent across various subgroups, including age, sex, assigned trial arm, and type of index event (all P values for interaction>0.05).

Conclusions: Hs-cTnT is associated with increased CVD risk in ischaemic stroke and TIA patients. Further studies are needed to investigate whether hs-cTnT is useful to improve risk prediction after stroke and TIA.

Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

2038

Never too Young? – Comparison of first-ever stroke characteristics and outcomes in individuals aged under 60 years old vs. over 60 years old

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Background and aims: Incidence of stroke in young adults is rising, with 15-25% of cases occurring in those aged <60 years. We compared patient characteristics and stroke-specific outcomes in those with first-ever stroke aged <60 years (defined as 'young stroke'[YS]) vs. >60 years ('old-age stroke'[OS]).
Methods: Individuals presenting with first-ever stroke between January-July 2022 were identified (n=565) and grouped into YS (n=135) or OS (n=430). Electronic medical records and Sentinel Stroke National Audit Programme data were reviewed.
Results: Median(IQR) age (years) of YS was 53 (46-57) vs. 78 (69-85) for OS. In YS, 69.6% were males(n=94/135) vs. 50.7%(n=218/430) in OS ($p<0.0001$). 83%(n=112/135) YS were non-white vs. 57.2%(n=246/430) OS ($p<0.0001$). 86.7% were of ischaemic aetiology in both YS(n=117/135) and OS(n=373/430) [p=0.98]. OS had significantly greater burden of risk factors vs. YS including hypertension (61.9%(n=266/430) vs. 40.7% (n=55/135)); atrial fibrillation (14.9%(n=64/430) vs. 0%(n=0/135)) and congestive cardiac failure (5.2%(n=22/430) vs. 0%(n=0/135)), all $p<0.05$. 20.7%(n=28/135) of YS had type 2 diabetes (T2D) vs. 33.5%(n=144/430) in OS, p=0.005. Additionally, 11.1%(n=15/135) YS had pre-diabetes vs. 34.9%(n=150/430) OS, $p<0.001$. YS with T2D had significantly higher admission HbA1C(mmol/mol) of 71 vs. 58 ($p<0.0002$). Median admission modified Rankin score increased from 0 to 2 upon discharge in YS vs. from 1 to 3 in OS. Mortality was significantly greater in OS (9.8%) vs. YS (2.2%), $p<0.005$.
Conclusions: YS individuals tend to be males, of non-white ethnicity. YS have lower mortality; however, this may result in longer-term disability. 3-in-5 YS present with co-morbid cardiometabolic risk factors, therefore primary prevention remains fundamental.
Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

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DEVELOPMENT AND VALIDATION OF ALL KINDS OF STROKE IDENTIFICATION ALGORITHM

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Background and aims: Identifying stroke among potential stroke cases is crucial for stroke research based on claims data. However, the accuracy of using the diagnostic codes of the International Classification of Diseases 10th revision was less than expected.
Methods: From the Health Insurance Review and Assessment (HIRA) claims data, stroke cases admitted to the hospitals participating in the Acute Stroke Quality Assessment Program (ASQAP) during the assessment period (2018) with a principal or additional diagnosis codes of I60-I64 on the 10th revision of International Classification of Diseases were extracted. The datasets were validated with other separate periods of assessment (2016). A stroke identification algorithm using the claims data was developed and validated through the linkage between the extracted claims data and the ASQAP data.
Results: Altogether, 59,992 potential cases were extracted from the HIRA claims data, of which 47.8% were certified as acute stroke through linkage with the ASQAP database. We selected 23 key identifiers from the claims data and developed 43 conditions through combinations of those key identifiers. The key identifiers comprised brain CT, MRI, use of tissue plasminogen activator, endovascular treatment, carotid endarterectomy or stenting, antithrombotics, anticoagulants, etc. The sensitivity, specificity, and diagnostic accuracy of the algorithm were 86.7%, 78.9%, and 82.7% in the development set, and 86.3%, 78.5%, and 82.2% in the validation set, respectively.
Conclusions: Our stroke identification algorithm may be useful to grasp the stroke burden in Korea. It can be utilized for the estimation of stroke epidemiologic data in countries using claims data.
Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

2122

RATIONALIZATIONS FOR FEMALE-ONLY RANDOMIZED CONTROLLED TRIALS IN CONDITIONS THAT AFFECT BOTH SEXES: FINDINGS FROM A SCOPING REVIEW

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Background and aims: Female participants have been historically underrepresented in clinical trials. To rectify this oversight, there are growing calls for the replication of randomized clinical trials (RCTs) in conditions that traditionally affect both sexes, but with exclusively female participants. This prospect raises important questions about the ethical justification of clinical trials. We conducted a scoping review to better understand if and how female-only RCTs are justified.
Methods: Reviewers searched electronic databases of medical literature for female-only RCTs in conditions that affect both sexes. We captured statements offering reasons to justify these RCTs, whenever available. A descriptive analysis of the extracted data was performed whereby reasons were coded into themes using a mixed-methods approach.
Results: From 7300 studies screened, 611 female-only RCTs were identified. Of these, 78 (13%) offered an explicit justification for the decision to recruit female participants. An additional 87 (14%) included statements that could be read as implicit justifications. The most common justifications were: 1) conditions disproportionately affected females (70/165, 42%) 2) sex-based differences in presentation, diagnosis or outcome (32/165, 19%) or 3) conditions were well studied in males but not in females (29/165, 17%).
Conclusions: A sizeable number of female-only RCTs, assessing treatments for conditions that affect both sexes, provided little-to-no justification for their choice to exclusively enroll female participants. When justifications were offered, they varied significantly. In order to ensure that female participants are not being disadvantaged by their participation in these kinds of trials, a clear and specific ethical justification should be provided.
Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

2436

Age- and sex-specific differences in hospitalization rates, risk factors and outcomes of ischaemic and haemorrhagic stroke from German nationwide data

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Background and aims: Significant age and sex differences have been reported at each stage of the stroke pathway from risk factors to outcomes. However, there is some uncertainty with regard to the role of potential confounders and selection bias. Using German nationwide data, we aimed to investigate whether there were any true age- or sex-specific differences with respect to admission rates, risk factors, and treatments of ischaemic and haemorrhagic stroke.

Methods: We obtained and analyzed data from the Research Data Centers of the Federal Statistical Office for the years 2010-2020 with regard to all acute stroke hospitalizations, risk factors, and treatments, stratified by age, sex and stroke subtype.

Results: Over the 11-year study period, there were 3,375,154 stroke events (83.7% ischaemic) with peak rates for all age groups between 2016-2017. There were more acute stroke admissions in men compared to women for both ischaemic (51 vs 49%) and haemorrhagic subtypes (52.4 vs 47.6%). This finding was consistent across all age groups and study years. Women were older than men (median age 79 vs 73 years) and had a greater burden of vascular comorbidities including hypertension (76.5 vs 74.3%), AF (33.6 vs 25.2%), CHF(12.5 vs 9.6%), CKD (14.7 vs 12.3%), and dementia (6.9 vs 4.2%) ($p<0.001$). Rates of thrombolysis and thrombectomies were similar between the sexes.

Conclusions: Based on nationwide German data, sex-specific differences remain with regard to hospitalization rates and risk factor prevalence but not therapies. Unlike other population-based studies, we did not observe a recent increase in young stroke.

Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

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Stroke Incidence and Outcome in a High-income Area: The Population-based Geneva Stroke Study

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Background and aims: Stroke is the leading cause of disability worldwide. However, even in high income countries, estimation of stroke incidence is based on few population-based studies. Here, we investigated the incidence and 3-month outcome in stroke patients within the high-income Geneva area.

Methods: We collected data from all patients with the diagnosis of stroke in the canton of Geneva (population 504'257 inhabitants), Switzerland from January 1st 2018, to December 31th, 2019. Patients were included if they suffered from ischemic stroke, intracerebral hemorrhage (ICH) or subarachnoid hemorrhage (SAH) based on the new WHO ICD-11 criteria.

Results: During the study period, we identified 1175 patients (mean age was 72.8 years (SD 15.8); 613 men (52.2%)) with the diagnosis of first-ever stroke. The incidence of stroke, age-adjusted to the European Standard population, was 116.5 (95% CI 109.8–123.2) per 100'000. For ischemic strokes, the age-adjusted incidence was 98.6 [92,4–104.7], 12.7 [10.5–14.9] for ICH and 5.3 [3.8–6.7] for SAH. Three-month age-adjusted mortality was 21.4/100'000 [95% CI 18.6–24.3] for all stroke types (ischemic stroke 16.1 [13.7–18.6]; ICH 5.1 [3.7–6.4]; SAH 0.2 [0–0.5].

Conclusions: Our results highlight the burden of stroke even in high income areas. The high incidence of first-ever stroke in our population compared to other western European countries may be related to i) the use of the new ICD 11 stroke definition, based on imaging and clinical criteria and ii) the systematic use of MRI in the Geneva area. JBEP and ED contributed equally

Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

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Influence of sex on prognosis and delay of care of acute ischemic stroke treated by Tenecteplase

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Background and aims: Women have a worse prognosis after acute ischemic stroke (AIS) than men but age is a huge confounding factor. We aimed to assess the influence of sex on prognosis and delay of care in AIS patients treated by intravenous tenecteplase (IVT).

Methods: We included AIS patients from the TETRIS cohort treated by IVT and eventually mechanical thrombectomy (MT) between 2017 and 2021. We evaluated the impact of sex on good functional outcome and on recanalization (mTICI$\geq$ 2b) in the IVT + MT population with propensity weighted analyses. We assessed the influence of sex on delay of IVT in the whole population (<180 min;>=180 min; unknown onset), by a multinomial logistic regression adjusted on age and pre-stroke mRS.

Results: 1134 patients treated with IVT (574 women, 560 men) among whom 668 patients (352 women, 316 men) treated also by MT were included. In the IVT + MT population, sex differences were observed on age ($p<0.001$), pre-Stroke mRS ($p=0.05$), TOAST classification ($p<0.001$) and delay from symptoms to IVT ($p=0.018$). In weighted analysis, sex did not affect functional outcome (P= 0.087) nor recanalization (P=0.124). Among patients treated by IVT alone, sex differences were observed on age ($p<0.001$), NIHSS ($p=0.03$) and pre-Stroke mRS ($p<0.001$). In

weighted analysis, sex was not associated with functional outcome (P=0.884). In the whole population, female sex was associated to an unknown onset (OR =1.62 [1.16-2.27]).
Conclusions: Sex does not influence the prognosis of treated AIS. Being a woman is associated with an unknown onset of AIS.
Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

2551

Short and long-term prognosis after tissue negative transient ischemic attack: data from the REGITELL registry

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Background and aims: Recently, it has been proposed to retire this concept as, probably, patients with brief episodes of transient brain ischemia do not exist or if they exist are rare with no risk of stroke recurrence (SR). However, few observational studies have determined the risk of SR exclusively among tissue-negative TIA patients. Our aim was to assess the early and long-term prognosis of consecutive tissue-negative TIA patients attended at an emergency department
Methods: We carried out a prospective cohort study of consecutive patients with tissue negative TIA from January 2006 to June 2010. All patients underwent DWI (4.0 [SD 1.8] days after the index event. The risk and predictors of SR were determined at 1 year and after a median follow-up time of 6.6 (interquartile range, 5.0-9.6) years.
Results: A total of 370 patients were included. Previously, 244 DWI positive patients and 109 without DWI were excluded. ABCD2 score>5 was determined in 95 (26.2%) patients. 15 (4.1%) patients suffered SR at 1 year and 18 (4.9%) beyond 1 year. Predictive models for short-term and long-term prognosis were different. Large artery atherosclerosis aetiology (Hazard ratio [HR] 3.7 [1.2-11.0]) was the only predictor of 1 year SR. In contrast, sex male (HR 3.5 [1.1-10.7]), speech impartment (HR 5.4[1.2-24.2]) and ABCD2>5 (HR 2.9[1.0-8.9]) were predictors of long-term follow-up.
Conclusions: The risk of SR after tissue negative TIA is not insignificant. Predictors of short and long-term prognosis are different. Sex, clinical characteristics at onset and aetiology determine the risk of SR.
Disclosure of interest: No

EPIDEMIOLOGY & RISK FACTORS

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NEIGHBORHOOD SOCIOECONOMIC STATUS, STROKE INCIDENCE AND FUNCTIONAL OUTCOMES IN BERLIN, GERMANY

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Background and aims: Neighborhood socioeconomic status (nSES) is known to contribute to stroke-related burden of disease. Population subsets with higher SES are less prone to suffering from stroke, and when affected, experience less severe consequences. However, research on this topic in the German setting is limited. We aimed to measure the associations between nSES and stroke incidence as well as functional outcome in Berlin, Germany.
Methods: We used information from the Social-Structure Atlas of Berlin to determine nSES by postal code, which included parameters such as unemployment, need for social aid, or lack of professional qualifications in 190 neighborhoods. We also used data from Berlin - SPecific Acute Treatment in Ischemic or hAemorrhagic Stroke With Long Term Follow-up (B-SPATIAL), a citywide registry of all acute stroke/TIA patients admitted to one of 15 stroke units across Berlin between 2016-2020. We estimated the association between nSES and stroke incidence using negative binomial regression and nSES and modified Rankin Scale scores at 3 months using ordinal logistic regression.
Results: Across Berlin neighborhoods, the higher the nSES, the lower the stroke incidence (incidence rate ratio= 0.94; CI: 0.89-0.98). Among stroke/TIA patients, the median 3-month mRS score was more favorable in neighborhoods with higher nSES (odds ratio= 0.88, CI: 0.83-0.93).
Conclusions: Berlin neighborhoods with higher neighborhood socioeconomic status had lower stroke incidence and, among those affected, more favorable median mRS scores at 3 months. These results are in line with findings from other settings and may be useful to inform the planning of healthcare provision.
Disclosure of interest: Yes

EPIDEMIOLOGY & RISK FACTORS

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STROKE AND MULTIMORBIDITY: A NATIONWIDE DATABASE STUDY FROM CHILE

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Background and aims: The presence of ⩾2 chronic diseases is frequent in stroke patients and has been associated with higher mortality, but scarce information from Latin American countries is available. We aimed to describe multimorbidity and determine its association with in-hospital mortality in stroke patients in Chile during 2019, using a large national hospital registry.
Methods A retrospective analysis of the Chilean national database Diagnosis Related Groups (GRD) that includes all adults admitted to hospital was performed. Multimorbidity in patients with stroke (CIE-10 codes: I60, I61, I62, I63, I64) was defined as the coexistence of ⩾2 conditions. In-hospital mortality in patients with principal diagnosis of ischemic stroke (IS) was calculated. Logistic regression was performed with STATA v17.1.
Results: During 2019, hospital discharge data for 811,407 patients and 1,048,576 hospitalization events were registered; 17,490 stroke patients with complete information were identified. Multimorbidity was present in 12,567 (71.8%) patients: 6,877 were male (54.7%), mean age of 68.3 years (SD=14.4) and 9,064 (72.1%) had 2 or 3 comorbidities. Principal diagnosis of IS was present in 10,744 patients: 732 (6.8%) received thrombolysis and 1,048 (9.8%) died during hospitalization. In-hospital mortality was independently associated to age (OR=2.1, 95%CI 1.77-2.42), admission to a hospital without stroke unit (SU) (OR=1.30 95%CI 1.14-1.49) and multimorbidity (OR=1.22 95%CI 1.04-1.43).

Conclusions: Multimorbidity is frequent in admitted stroke patients in Chile, and is associated with in-hospital mortality, along with age and admission to a non-SU hospital. Further analyses will provide complementary data to inform local health system and policies.
Disclosure of interest: Yes

EPIDEMIOLOGY & RISK FACTORS

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CHARACTERISTICS OF PATIENTS WITH LARGE HEMISPHERIC INFARCTION AND ACUTE ISCHAEMIC STROKE FROM A LARGE ELECTRONIC HEALTH RECORDS DATABASE

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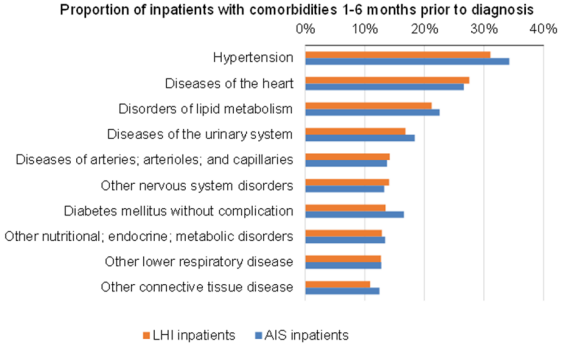
Background and aims: Large hemispheric infarction (LHI) is a severe form of acute ischaemic stroke (AIS) that is rarely examined at the population level. We compared the demographic and clinical characteristics of the LHI patient population with the broader AIS patient population using electronic health records (EHR) data.
Methods: Data from the U.S. Optum® de-identified EHR database during 01/10/2015-30/09/2021 were used. LHI cases were defined as individuals with diagnosis of middle cerebral artery or carotid artery infarction and ⩾1 brain oedema diagnosis, mannitol/hypertonic saline injection, or decompressive craniectomy code. AIS cases were determined using ICD-10-CM diagnosis codes (I63*).
Results: Among the 13,242 identified LHI cases, 48.1% were female, 74.2% were white, and mean age was 65 years. AIS cases (N=413,001) had similar demographic characteristics. Compared to AIS inpatients, LHI inpatients on average, had higher baseline NIHSS scores (16 vs. 7), longer hospital stay (13 days vs. 7 days), and higher proportion discharged to another healthcare facility (57% vs. 40%). Additionally, a higher proportion of LHI inpatients underwent treatment with tissue plasminogen activator (24% vs. 11%), endovascular thrombectomy (28% vs. 5%), or decompressive craniectomy (12% vs. 1%) than AIS inpatients. LHI and AIS inpatients had similar pre-diagnosis comorbidities and medication use, however, more LHI inpatients had post-diagnosis medication use (Figures).
Conclusions: LHI patients had similar demographic characteristics and pre-diagnosis comorbidities as AIS patients but had longer hospital stays, higher rates of acute stroke interventions, and post-stroke medication use.

Figure 1. Common comorbidities (at the Clinical Classification System level) for LHI and AIS inpatients in the Optum® EHR Database (01/10/2015-30/09/2021)



Figures 2a-2c. Common medication use (at the Uniform System of Classification Level 2) for LHI and AIS inpatients in the Optum® EHR Database (01/10/2015-30/09/2021)

Figure 2a. Proportion of inpatients with medication use **1-6 months prior to diagnosis**

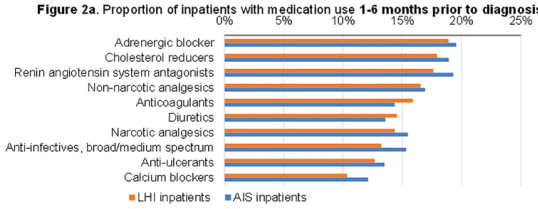


Figure 2b. Proportion of inpatients with medication use **between 7 days prior to and 30 days post diagnosis**

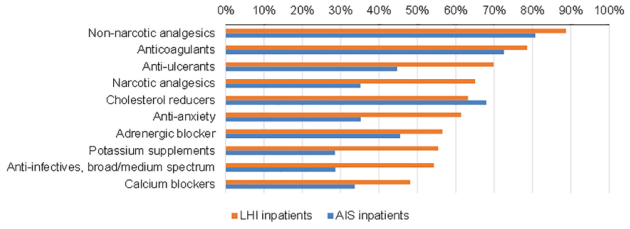
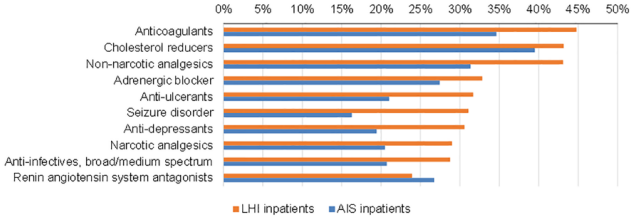


Figure 2c. Proportion of inpatients with medication use **1-6 months post diagnosis**



Disclosure of interest: Yes

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DEVELOPMENT OF CASE DEFINITION ALGORITHMS TO IDENTIFY LARGE HEMISPHERIC INFARCTION (LHI) IN HEALTHCARE ADMINISTRATIVE DATA

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Background and aims: LHI –a severe form of ischaemic stroke affecting the middle cerebral artery (MCA) territory and often complicated by brain oedema– does not have specific ICD codes, posing challenges to reporting medical claims and tracking disease statistics. We propose two LHI case definitions.
Methods: Using the U.S. Optum's de-identified Clinformatics® Data Mart Database from 01/10/2015-30/09/2021, we examined two LHI case definitions: a narrow definition that included patients with diagnosis of MCA/carotid artery (CA) infarction and brain oedema diagnosis, mannitol/hypertonic saline injection, or decompressive craniectomy; and an expanded definition that added patients with other/unspecified cerebral infarction diagnoses, because in practice affected arteries are often not specified in coding and the infarction is likely in the MCA/CA when accompanied by brain oedema. Diagnoses and treatments were identified using ICD-10, HCPCS, NDC, and CPT codes.

Results: Among 176,909 cases with MCA/CA infarction (mean NIHSS score:9), 13,999 (8%) cases developed brain oedema (mean NIHSS score:16) and met our narrow definition. Among 898,260 cases with MCA/CA infarction or other/unspecified cerebral infarction (mean NIHSS score:7), 41,773 (5%) developed brain oedema (mean NIHSS score:13) and met our expanded definition. Of the patients defined using the narrow definition, 47% were males, 62% were White, and the mean age was 72 years; distributions were similar with the expanded definition.
Conclusions: Our narrow definition captures the clinical definition of LHI, whereas our expanded definition accounts for coding issues in practice and may capture a broader LHI patient population.
Disclosure of interest: Yes

EPIDEMIOLOGY & RISK FACTORS

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Stroke in Very Elderly in India : Clinical profile, Risk Factor and Outcome:Is Stroke different after 80years age?

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Background and aims: Limited data is available regarding the very elderly stroke patients in India. In the present study, clinical profile, risk factors, and outcomes of very elderly stroke patients ($\geqslant$ 80 years) were studied and compared them to that of elderly stroke patients (age 60-79 years).
Methods: A single center, observational ambispective study was carried out at a tertiary care center in Northern India, including 1013 patients over a period of 8 years. Based on the age of patients, they were divided into elderly group (EG, n-873) and very elderly (VEG, n-140) groups.
Results: Mean age of patients in EG and VEG is 66.97 $\pm$ 5.4 years and VEG is 83.34 $\pm$ 3.7 years respectively. Male predominance with a sex ratio of 2.14:1 is seen in EG, while equal sex distribution seen in VEG. Ischemic stroke constituted most common stroke type.CVT is rare in both groups with below 1%. Rate of atrial fibrillation esp., non-valvular was higher in VEG. In-hospital mortality is significantly higher in VEG (18.4% vs 8.6%) and so is the unfavorable functional outcome (mRS) at discharge (58.9% vs 52.5%).
Conclusions: While male predominance was seen in EG,female predominance was seen in VEG with hemorrhagic stroke. Stroke subtyping varied among both the groups with, predominance of large artery atherosclerosis in EG and cardioembolic in VEG. VAP and sepsis were likely contributing factors for the worse outcomes in VEG. Annual electrocardiogram for VEG patients can be suggested for early AF detection for stroke prevention,with appropriate control of risk factors.
Disclosure of interest: No

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DIABETES MELLITUS NEGATIVELY AFFECTS OUTCOME IN STROKE PATIENTS TREATED WITH ENDOVASCULAR THROMBECTOMY

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Background and aims: Endovascular treatment (ET) is standard of care in patients with large vessel occlusion stroke (LVOS). Previous data suggests that diabetes mellitus (DM) is associated with poor outcome after ET in LVOS patients. We aimed to study the outcome of DM patients with LVOS treated with ET.
Methods: We analyzed patients from the German Stroke Registry – Endovascular Treatment trial, an observational multicenter cohort with acute ischemic stroke undergoing endovascular treatment. Baseline characteristics, procedural parameters and functional outcome at 90 days were compared between diabetic patients and matched controls and multivariable ordinal regression analysis was performed.
Results: Out of 6635 LVOS patients treated with ET, 1308 (20.8%) had diabetes mellitus. Compared to a matched cohort of non-diabetic patients, median NIHSS at 24 hours was higher (13, interquartile range [IQR] 5-20 vs. 10, IQR 4-19, $p<0.001$) and good functional outcome (mRS 0-2) at three months was less frequent (26.2 vs 37.3%, $p<0.001$) in diabetic patients. Diabetes mellitus was an independent predictor of functional outcome at 90-day follow-up with an adjusted odds ratio of 0.61 (CI 0.53-0.70, $p<0.001$).
Conclusions: LVOS patients with diabetes mellitus undergoing ET have worse outcomes compared to non-diabetic patient, even when matched for prestroke condition, comorbidities and stroke severity.
Disclosure of interest: Yes

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Variations in associations of Atrial Fibrillation and Ischemic Stroke in countries with different Income-Levels: INTERSTROKE case-control study

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Background and aims: Atrial fibrillation (AF) is a major risk factor for ischemic stroke, but its contribution to burden of stroke may vary by country income-level. We describe the variations in the association of AF with acute ischemic stroke by country income-level.
Methods: In the INTERSTROKE study, we recruited participants with acute first stroke (cases) who were matched to controls for sex and age, from 142 centres in 32 countries (n=20,696). Countries were grouped based on gross national income. We evaluated the risk factors for AF overall and by country income-level and evaluated variations in the association of AF with ischemic stroke.
Results: AF was documented in 11.9% of cases and 3.2% of controls. The prevalence varied by country income level, and the odds of atrial fibrillation was significantly lower in lower income regions compared to higher income regions. Hypertension, female sex, valvular heart disease and alcohol intake were stronger risk factors for AF in lower income countries, and obesity a stronger risk factor in higher income countries. The magnitude of association of AF with stroke was significantly higher in lower income countries compared to higher income countries on multivariable analysis.
Conclusions: Risk factors for AF vary significantly by country-income level and AF contributes to stroke burden to a greater extent in poor countries. These differences are not explained by differences in age or known clinical characteristics associated with AF and suggest that there may be unknown risk factors for AF that are more common in higher-income countries.
Disclosure of interest: No

IMAGING – HYPERACUTE

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Good Leptomeningeal Collaterals are Associated with Large-Artery Atherosclerosis Stroke Etiology

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Background and aims: Progressive atherosclerotic stenosis of brain-supplying large arteries may promote collateral formation. Among patients with acute ischemic stroke (AIS), we aimed to assess the association of large-artery atherosclerosis (LAS) and collateral status and compare it with cardioembolic (CE) stroke and stroke due to small-vessel disease (SVD).

Methods: We analyzed the collateral status of consecutive adult patients with AIS at a certified Swiss stroke center. Stroke etiology was categorized as LAS, CE and SVD according to the TOAST classification. Collateral status was assessed on admission single-phase CT-angiographies by an assessor blinded to clinical outcomes (0: no collaterals, 1: <50%, 2: >50%, and <100% 3: 100% of the supply region of the medial cerebral artery). We performed ordinal and binary (poor [≤50%] vs. good [>50%] collateralization) logistic regression to evaluate the impact of stroke etiology on collateral status. We adjusted for age, sex, hypertension, smoking status, and dyslipidemia.

Results: Of 147 included patients, 49 had LAS (Table 1). On admission, LAS patients presented with the lowest NIHSS scores (LAS: 1, SVD: 5, CE: 10, p=<0.001, Table 1) and the best collateralization status compared to SVD and CE stroke etiology (Table 2). In multivariable ordinal logistic regression, LAS was an independent predictor of better collateralization, whereas CE was associated with worse collateralization (acOR: LAS: 2.17 [95%CI: 1.10-4.26], p=0.03; CE: 0.26 [95%CI: 0.13-0.53], p=<0.001; Table 2).

Conclusions: Stroke etiology may influence collateralization status on admission CT-angiography. LAS is associated with the best, CE with the worst collateral status on admission.

Table 1. Baseline characteristics of acute ischemic stroke patients according to TOAST stroke etiologies

	Total (N=147)	Stroke etiology according to TOAST§ LAS (N=49)	CE (N=50)	SVD (N=48)	P value	Missings (%)
Demographics						
Age (median, IQR) – in years	79 (68-84)	76 (68-82)	82 (77-86)	73 (64-82)	**<0.001**	0 (0)
Female (n, %)	51 (35)	13 (27)	21 (42)	17 (35)	0.27	0 (0)
Admission characteristics¶ (median, IQR)						
BMI – in kg/m²	25 (23-28)	25 (23-27)	25 (23-28)	26 (23-28)	0.85	2 (1)
Systolic blood pressure – in mmHg	151 (136-170)	140 (125-150)	155 (135-170)	163 (150-184)	**<0.001**	0 (0)
NIHSS on admission	5 (2-9)	1 (0-4)	10 (6-16)	5 (3-8)	**<0.001**	2 (1)
Collateral score	2 (2-3)	3 (2-3)	2 (1-3)	3 (2-3)	**0.002**	0 (0)
Medical history€ (n, %)						
Premorbid mRS	0 (0-1)	0 (0-0)	1 (0-2)	0 (0-1)	**<0.001**	21 (14)
Hypertension	115 (78)	40 (82)	44 (88)	31 (65)	**0.02**	0 (0)
Diabetes	34 (23)	11 (22)	10 (20)	13 (27)	0.70	0 (0)
Dyslipidemia	80 (54)	29 (59)	27 (54)	24 (50)	0.66	0 (0)
Smoking	47 (32)	29 (59)	7 (14)	11 (23)	**<0.001**	0 (0)
Atrial fibrillation	51 (35)	8 (16)	42 (84)	1 (2)	**<0.001**	0 (0)
Coronary artery disease	32 (22)	13 (27)	11 (22)	8 (17)	0.50	0 (0)
Myocardial infarction	19 (13)	10 (20)	8 (16)	1 (2)	**0.02**	0 (0)
Chronic kidney disease	29 (20)	8 (16)	15 (30)	6 (13)	0.07	0 (0)
Peripheral artery disease	6 (4)	3 (6)	2 (4)	1 (2)	0.60	0 (0)
Prior medication (n, %)						
Antiplatelets	57 (39)	24 (49)	14 (28)	19 (40)	0.100	0 (0)
Anticoagulants	20 (14)	6 (12)	14 (28)	0 (0)	**<0.001**	0 (0)
Antihypertensives	93 (64)	34 (69)	38 (78)	21 (44)	**0.001**	1 (<1)
Lipid-lowering drugs	41 (28)	19 (39)	9 (18)	13 (27)	0.08	1 (<1)
Laboratory parameters on admission# (median, IQR)						
Total cholesterol – in mmol/L	4.7 (3.9-5.4)	4.6 (3.7-5.4)	4.5 (3.7-5.1)	4.8 (4.2-5.6)	0.14	1 (<1)
LDL cholesterol – in mmol/L	2.5 (1.9-3.2)	2.4 (1.8-3.4)	2.4 (1.9-2.9)	2.7 (2.1-3.2)	0.21	3 (2)
Glucose – in mmol/L	6.3 (5.4-7.6)	5.7 (5.0-6.7)	7.0 (6.1-8.4)	6.2 (5.5-8.5)	**<0.001**	4 (3)
Creatinine – in µmol/l	80.0 (70.0-99.0)	77.5 (68.0-102.0)	84.5 (74.0-111.0)	78.0 (68.5-91.0)	0.11	3 (2)
eGFR – in mL/min/1.7	72.5 (54.5-85.5)	76.0 (61.0-89.0)	65.0 (47.0-77.0)	80.0 (64.0-88.0)	**0.003**	3 (2)
Hemoglobin – in g/L	139.0 (126.0-150.0)	136.0 (124.0-150.0)	140.0 (127.0-150.0)	145.0 (127.0-152.0)	0.37	4 (3)
C-reactive protein – in mg/L	2.7 (1.3-6.0)	2.2 (1.2-4.7)	3.8 (2.2-7.9)	1.8 (1.0-3.1)	**<0.001**	3 (2)
INR	1.0 (1.0-1.1)	1.1 (1.0-1.1)	1.0 (1.0-1.1)	1.0 (0.9-1.1)	**0.02**	5 (3)
Treatment characteristics¥ (n, %)						
iVT	89 (61)	7 (14)	35 (70)	47 (98)	**<0.001**	0 (0)
EVT	39 (27)	6 (12)	32 (64)	1 (2)	**<0.001**	0 (0)

§ - TOAST: Trial of Org 10 172 in Acute Stroke Treatment; LAS: large artery atherosclerosis; CE: cardioembolic; SVD: small vessel disease
¶ - BMI: body mass index; NIHSS: National Institutes of Health Stroke Scale; collateral score: 0 = absent collaterals, 1 = collaterals filling ≤ 50% of the occluded territory, 2 = collaterals filling > 50% but < 100% of the occluded territory, 3 = collaterals filling 100% of the occluded territory.
€ - mRS: modified Rankin Scale
- LDL: low-density lipoprotein; eGFR: estimated glomerular filtration rate; INR: International Normalized Ratio
¥ - iVT: intravenous thrombolysis; EVT: endovascular treatment

Table 2. Impact of stroke etiology on collateralization status in univariable logistic regression

	Ordinal logistic regression† acOR	95%CI	P-value
Shift toward higher collateral score			
LAS	2.00	1.04-3.84	**0.04**
CE	0.29	0.15-0.56	**<0.001**
SVD	1.62	0.85-3.10	0.14
	Binary logistic regression† aOR	95%CI	P-value
Good collateralization¶			
LAS	3.70	1.33-10.27	**0.01**
CE	0.18	0.08-0.41	**<0.001**
SVD	2.20	0.88-5.49	0.09

According to TOAST (Trial of Org 10 172 in Acute Stroke Treatment) classification: LAS: large artery atherosclerosis; CE: cardioembolic; SVD: small vessel disease. Collateral score: 0 = absent collaterals, 1 = collaterals filling ≤ 50% of the occluded territory, 2 = collaterals filling > 50% but < 100% of the occluded territory, 3 = collaterals filling 100% of the occluded territory

† Adjusted odds ratios (aOR) (binary regression) and adjusted common odds ratios (acOR) (ordinal regression) are reported. We state 95% confidence intervals (CI).

¶ Good collateralization: defined as collateral filling of >50% of the occluded territory.

Table 3. Impact of stroke etiology on collateralization status in multivariable logistic regression

	Ordinal logistic regression† acOR	95%CI	P-value
Shift toward higher collateral score			
LAS	2.17	1.10-4.26	**0.03**
CE	0.26	0.13-0.53	**<0.001**
SVD	1.53	0.77-3.04	0.22
	Binary logistic regression† aOR	95%CI	P-value
Good collateralization¶			
LAS	4.64	1.61-13.34	**0.004**
CE	0.09	0.03-0.26	**<0.001**
SVD	2.33	0.88-6.15	0.09

According to TOAST (Trial of Org 10 172 in Acute Stroke Treatment) classification: LAS: large artery atherosclerosis; CE: cardioembolic; SVD: small vessel disease. Collateral score: 0 = absent collaterals, 1 = collaterals filling ≤ 50% of the occluded territory, 2 = collaterals filling > 50% but < 100% of the occluded territory, 3 = collaterals filling 100% of the occluded territory

† Adjusted odds ratios (aOR) (binary regression) and adjusted common odds ratios (acOR) (ordinal regression) are reported. We state 95% confidence intervals (CI).

¶ Good collateralization: defined as collateral filling of >50% of the occluded territory.

Following covariables were used: age, sex, hypertension, dyslipidemia. Only cases without missing data for one or more covariable were considered for the analyses (N_{total}=147).

Disclosure of interest: No

IMAGING – HYPERACUTE

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Ghost Infarct Core Phenomenon: Frequency, Magnitude, and Variables of Ischemic Core Overestimation

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Background and aims: Ghost infarct core phenomenon has been coined to describe CTP core overestimation in the selection of patients with large vessel occlusion for mechanical thrombectomy. Our aim is to review the frequency, magnitude, and variables associated with core overestimation.

Methods: A primary literature search was performed with PubMed Database with the following terms: ''ghost infarct core'' and ''ischemic core overestimation''. Eight studies documenting median time from symptom onset to CTP, median estimated core size, median final infarct volume, median core overestimation of the ghost infarct core population, recanalization rates, and good outcomes were included.

Results: All studies investigated patients that underwent CTP within six hours of symptom onset, ranging from median times of 105 to 309 minutes. The frequency of core overestimation varied from 6% to 58.4%,

while the median estimated ischemic core and final infarction volume ranged from 7 to 27mL, and 12 to 31mL, respectively. The median core overestimation ranged from 3.6 to 30mL with upper quartile ranges up to 58 mL. GIC was found to be a highly time-and-collateral-dependent process that increases in frequency and magnitude as the time from symptom onset to imaging decreases and in the presence of poor collaterals.

Conclusions: CTP ischemic core overestimation appears to be a relatively common phenomenon that is most frequent in patients with poor collaterals imaged within the acute time window. Early perfusion imaging should be interpreted with caution to prevent the inadvertent exclusion of patients from highly effective reperfusion therapies.

Table 1.

		All PATIENTS					
Studies	Sample (n)	Median (IQR) time from SOCTP (mins)	Median time (IQR) from CTP to reperfusion (mins)	Median (IQR) Estimated Core (mL)	Median (IQR) Final Infarct Volume (mL)	Median (IQR) Core Overestimation (mL)	Recanalization Rate (TICI2b-3)	Good Outcomes
Boned et al.	79	215 (87 – 327)	119 (88 - 159)	27 (2 – 65)	12 (2 – 45)	-	77.0%	39.7%
Martins et al.	123	188 (87 – 288)	56 (40 - 84)	8 (0 – 35)	12 (1 – 67)	3.56 (-5 to 34)	82.9%	36.8%
Hoving et al.	120	109 (71 – 152)	114 (82 - 159)	7.8 (1.8 – 19.9)	30.8 (14.9 - 67.6)	18.3 (14.3 - 25.5)	-	-
Rotem et al.	31	106 (38 – 381)	114 (50 - 173)	-	-	-	100%*	-
Rodriguez et al.	923	306.5 (177.8 – 614)	99 (72 - 132)	7 (0 – 23)	25.2 (10.6 – 63.3)	13.29 (3.75 - 26.1)	63.6%	57.2%
Garcia-Tornel et al.	407	168 (90 – 392)	93 (70 - 124)	7 (0 – 27)	20 (5 – 55)	8 (1 - 32)	80.0%	52.9%
Sarraj et al.	101	138 (82 – 244)	-	9 (0 – 31.8)	18.4 (5.3 – 68.7)	13.2 (2.9 - 36.4)	100%*	55.4%
Xu et al.	115	299 (207 - 431)	-	7 (0 - 27)	19 (10 - 53)	30 (17 - 58)	100%*	78.3%

Median: IQR, interquartile range; SOCTP, symptom onset to computed tomography perfusion; CTP, computed tomography perfusion; TICI, Thrombolysis in Cerebral Infarction.
*All patients in the study underwent successful EVT.

		GIC					
Studies	Sample (n)	Median (IQR) time from SOCTP (mins)	Median time (IQR) from CTP to reperfusion (mins)	Median (IQR) Estimated Core (mL)	Median (IQR) Final Infarct Volume (mL)	Median (IQR) Core Overestimation (mL)	Recanalization Rate (TICI2b-3)	Good Outcomes
Boned et al.	30	165 (66 - 323)	136 (85 - 171)	65 (46 - 92)	19 (4 - 26)	-	90.0%	61.1%
Martins et al.	20	107 (50 - 227)	42 (33 - 78)	36 (26 – 59)	6 (1 - 13)	-27 (-46.4 to -14)	90.0%	52.6%
Hoving et al.	17	-	-	-	-	18.3 (14.3 - 25.5)	-	-
Rotem et al.	17	89	110	-	-	-	100%*	-
Rodriguez et al.	77	209 (118 - 363)	100.5 (75.5 - 134)	41 (26.4 - 63)	10.7 (4.7 - 26.6)	23.2 (10.4 - 38.3)	67.5%	76.2%
Garcia-Tornel et al.	83	107 (53 - 229)	89 (62 - 118)	28 (10 - 64)	13 (4 – 49)	12 (5 - 41)	68.0%	62.0%
Sarraj et al.	6	36.5 (14 - 47)	61.5 (71 - 94)	51.5 (34 - 73)	0.8 (0.48 - 5.28)	34.6 (28.1 - 43)	100%*	50.0%
Xu et al.	18	179 (85 - 251)	-	68 (28 – 92)	16 (7 – 43)	30 (17 - 58)	100%*	77.8%

GIC, ghost infarct core; median IQR, interquartile range; SOCTP, symptom onset to computed tomography perfusion; CTP, computed tomography perfusion; TICI, Thrombolysis in Cerebral Infarction.
*All patients in the study underwent successful EVT.

Studies	Sample (n)	Frequency of Core Overestimation (%)
Boned et al.	30	36.0%
Martins et al.	20	16.0%
Hoving et al.	17	14.0%
Rotem et al.	17	58.4%
Rodriguez et al.	77	8.3%
Garcia-Tornel et al.	83	20.0%
Sarraj et al.	6	6.0%
Xu et al.	18	15.7%

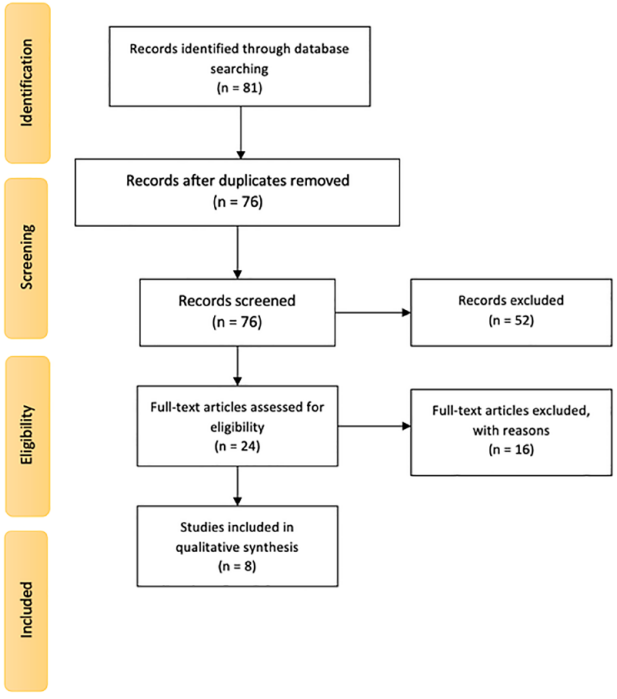

Figure 1.

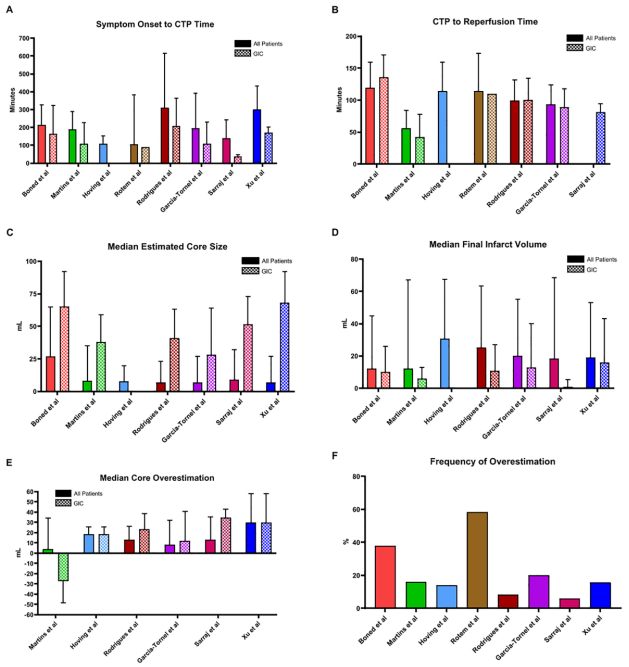

Figure 2.

Disclosure of interest: No

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Value of Immediate Flat Panel Perfusion Imaging After Endovascular Therapy (AFTERMATH): A proof of concept study

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Background and aims: Clinical utility and diagnostic sensitivity of new generation flat-panel computed tomography perfusion imaging (FPCTP) performed immediately after mechanical thrombectomy (MT) is unknown. We aimed to assess if FPCTP obtained directly after MT could provide additional potentially relevant information on tissue reperfusion status.

Methods: Qualitative, single-center analysis of all consecutive acute stroke patients between 06/2019 and 03/2021 who underwent MT and

post-interventional FPCTP. A core-lab blinded to technical details and clinical data performed reperfusion grading on post-interventional digital subtraction angiography (DSA) images and time-sensitive FPCTP maps. All patients were allocated into groups depending on the hypoperfusion agreement between DSA and FPCTP.

Results: In 11/26 patients FPCTP revealed new, potentially clinically relevant informations. Core lab adjudicated dichotomized detection of hypoperfusion (present/absent) was concurring in 21/26 (81%) patients. Of these, reperfusion findings showed perfect agreement in location and size in 15 (58%) patients, while in 6 (21%) patients with incomplete reperfusion, FPCTP showed additional hypoperfused findings not noted by the readers on DSA. In the remaining 5 patients, there were 3 with complete reperfusion on DSA but hypoperfusion on FPCTP, while 2 had incomplete reperfusion on the DSA without detectable hypoperfusion on FPCTP. FPCTP could have mitigated TICI overstimation in all false-positive operator-rated TICI3 cases.

Conclusions: In both core-lab and real-world operator assessment, FPCTP may provide additional clinically relevant information in a considerable percentage of patients undergoing MT. Hence, FPCTP may constitute a new standard for evaluating reperfusion efficacy and informed decision making in the angiography suite.

Disclosure of interest: No

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Radiological factors associated with poorer functional outcome in an Asian cohort of ischemic stroke patients undergoing mechanical thrombectomy

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Background and aims: Endovascular thrombectomy(EVT) is the current standard of care. Unfortunately, up to half of patients with stroke have poor functional outcomes despite successful reperfusion post-EVT. Many radiological markers are purportedly associated with improved patient outcomes. We sought to determine which clinico-radiological factors may pre-procedurally guide patient selection.

Methods: A retrospective study of patients who underwent EVT from 2015-2020 was performed studying various clinical, demographic and radiological factors that had been reported in the literature to affect functional outcomes. Univariate and multivariate analysis was performed.

Results: Within our cohort of 333 consecutive patients, age, Alberta mCTA score, ASPECTS, clot length, thrombus Houndsfield Units(HU) and mTICI score were associated with good functional outcome at 3 months on univariate analysis. On multivariate analysis, age, Alberta mCTA collaterals and ASPECTS were significantly associated with functional outcomes.

Conclusions: Among the proposed radiological markers for patients in the hyperacute setting, existing well-validated clinico-radiological measures remain strongly associated with functional status.

Disclosure of interest: No

	Univariate Analysis			Multivariate Analysis	
	mRS 0-2	mRS 3-6	P-value	Adjusted OR(95% CI)	P-value
Age,mean	61.2	69.5	<**0.000**	1.057 (1.016-1.099)	0.006
Female	56(42.4%)	92(47.6%)	0.366		
IV TPA	84(64.1%)	126(65.3%)	0.906		
Onset-to-puncture(mean,mins)	283.7	280.3	0.880		
Alberta mCTA<3	86(95.6%)	79(70.5%)	<**0.000**	17.012 (1.979-146.234)	0.010
MCA Top-to-bottom distance(mean,cm)	0.689	0.704	0.627		
Aortic arch type(median)	2	2	0.871		
Clot burden score(median)	4	4	0.174		
ASPECTS(median)	9	7	<**0.000**	0.678 (0.476–0.966)	0.031
MCA-hyperdensity	70(59.3%)	118(67.4%)	0.173		
Clot length(mean,cm)	1.26	1.54	**0.014**	1.001 (0.488–2.056)	0.997
Thrombus HU(non-contrasted CT)	117(39.10)	170(41.61)	**0.040**	1.031 (0.980–1.085)	0.236
TICI2B/3	116(92.1%)	137(71.7%)	< **0.000**	0.294 (0.050 – 1.710)	0.173

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Association of plasma glucose levels and cerebral computed tomography perfusion imaging parameters

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Background and aims: Admission hyperglycemia is common and associated with worse outcome in patients with acute ischemic stroke despite diabetic status, but strict glycemic control has yet failed to yield beneficial outcome. Whether admission hyperglycemia is a causal factor or rather a physiological consequence of severe ischemia remains unclear. We aimed to evaluate the still equivocal association between admission hyperglycemia and Cerebral Tomography Perfusion (CTP) imaging parameters.

Methods: We included 1167 consecutive stroke code patients imaged with CTP from the prospective cohort of Helsinki Stroke Quality Registry. The CTP parameters, calculated by RAPID®, were ischemic core defined as Cerebral Blood Flow <30%, and hypoperfusion lesions were Time-to-Maximum (Tmax) >6 s and Tmax >10 s. We used linear regression adjusting for age, sex, C-reactive protein, baseline NIHSS and onset-imaging time.

Results: In the 927 (79%) non-diabetic patients, admission glucose (median 6.6 mmol/L, interquartile range [IQR] 5.8-7.8 mmol/L) was associated with Tmax >6 s with a regression coefficient (RC) 0.55 (95% confidence interval [CI] 0.58-6.45, p=0.02), but also associated with ischemic core with a RC 0.44 (95% CI 0.41-3.12, p=0.01). Admission hyperglycemia (glucose >7.8 mmol/L) was stated in 271 (23%) patients. If acute recanalization therapies were performed, Tmax >6 s was 39 mL (IQR 4-109 mL), Tmax >10 s was 6 mL (IQR 0-33 mL), and ischemic core was 0 mL (IQR 0-13 mL). No statistically significant association was shown in diabetic patients.

Conclusions: Admission hyperglycemia appears to be most robustly associated with larger hypoperfusion lesion volume in non-diabetic stroke code patients.

Disclosure of interest: No

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RADIOMICS IN ACUTE STROKE: INDIVIDUALIZED TISSUE OUTCOME PREDICTION AFTER MECHANICAL THROMBECTOMY USING CONVOLUTIONAL NEURAL NETWORKS

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Background and aims: The advent of mechanical thrombectomy significantly improved the prognosis of stroke patients with proximal vessel occlusion. Perfusion CT based on thresholded perfusion parameter maps aids patient selection in the extended time window (> 6 h). However, machine-learning approaches can model complex relationships between multiparametric data and might better exploit the full information contained in the high-dimensional perfusion data. We implemented a convolutional neuronal network (CNN) to predict tissue outcome depending on recanalization success based on multimodal CT imaging and clinical biomarkers.
Methods: Our multicenter retrospective study included 405 stroke patients with acute proximal vessel occlusion in the anterior circulation that underwent mechanical thrombectomy. The model was trained with the knowledge of recanalization status and final infarct localization. For comparison, we also implemented a multiparametric mass-univariate logistic regression model serving as a methodological baseline.
Results: Preliminary data suggest that by taking multiparametric imaging data and patient-specific clinical factors into account, our CNN allows an individual voxel-based tissue outcome prediction depending on the recanalization success. Thereby, the CNN outperforms classical single-parameter thresholding-based methods and the logistic regression approach.
Conclusions: The CNN-based tissue outcome prediction provides an individual biomarker for the benefit of mechanical thrombectomy in acute stroke care and might aid in selecting patients in the extended or unknown time window.
Disclosure of interest: No

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Prediction of intracranial atherosclerotic acute large vessel occlusion with baseline neuroimaging before endovascular treatment

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Background and aims: In the era of endovascular treatment (EVT), underlying intracranial atherosclerotic disease (ICAD) continues to be a therapeutic challenge. We aimed to analyze automated CT perfusion parameters and intracranial artery calcifications (IAC) in order to predict large vessel occlusion (LVO) with underlying ICAD before EVT.
Methods: Retrospective cross-sectional study of consecutive patients with stroke treated with EVT from January-2020 to April-2022. We included isolated intracranial LVO occlusions (internal carotid, segments 1-2 of middle cerebral, vertebral and/or basilar arteries). We described the presence of occlusion-related IAC, CTP automated parameters, and clinical features. We analyzed their value to predict underlying ICAD (determined by angiographic residual stenosis or a significant re-occlusion during EVT procedure).
Results: Of 364 patients included, 38 patients (10.4%) presented a LVO with underlying ICAD. After adjusting for identifiable confounders, IAC (OR 6.28, 95%CI 1.82-21.67, p=0.004), hypoperfusion intensity ratio (Tmax>10s/Tmax>6s ratio, HIR; OR 0.01, 95%CI 0.00-0.09, p<0.001), M2-MCA occlusion (OR 0.12, 95%CI 0.03-0.57, p=0.008) and atrial fibrillation (OR 0.05, 95%CI 0.01-0.41, p=0.005) emerged as independent predictors of ICAD. In ROC analyses, a model with these features showed an excellent predictive capability to detect ICAD (area under the curve 0.88, 95%CI 0.82-0.94, p<0.001).
Conclusions: Presence of symptomatic IAC, low HIR, absence of atrial fibrillation and occlusion location can predict underlying ICAD before EVT. This rapid assessment may guide optimal EVT strategy in selected patients that could benefit from an early intracranial angioplasty and/or stenting.
Disclosure of interest: No

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Acute infarct underestimation by CT perfusion imaging

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Background and aims: Cerebral perfusion during ischemic stroke is dynamic and may affect computed tomography perfusion (CTP) performance. We aim to assess infarct underestimation by CTP in acute ischemic stroke with large vessel occlusions and evaluate detection of these underestimated areas by non-contrast CT (NCCT).
Methods: We coregistered baseline NCCT and CTP images to follow-up diffusion-weighted magnetic resonance images in 109 patients with successful endovascular treatment (EVT). We obtained ischemic core volumes on CTP based on reduction in relative cerebral blood flow (rCBF) and performed semi-automated detection of the acute stroke lesions on relative NCCT (rNCCT). We calculated lesion volumes and assessed the accuracy for detection of follow-up infarct using voxel-based analyses in all patients and compared early (⩽ 6h after symptom onset) vs late (> 6h) presenters.
Results: CTP undercalled the final infarct by median 11 mL (IQR 4-25). Infarct underestimation was greater in late (median 17mL [IQR 7-33]) vs

early presenters (median 7 mL [IQR 4-25], p = 0.005). rNCCT detected median 10% (IQR 1-31) of the CTP core undercall (median 3% [IQR 0-15]) in early and median 24% [IQR 9-48] in late presenters. Balanced accuracy for infarct detection increased from 0.56 (IQR 0.50-0.67) for CTP core to 0.67 (IQR 0.53-0.74; p < 0.001) after combining CTP core and the rNCCT lesion segmentation.

Conclusions: Infarct underestimation by CTP is substantial and partially detectable by NCCT, especially in patients presenting in the later time window. Combining NCCT and CTP lesions increases the diagnostic accuracy to predict the infarct.

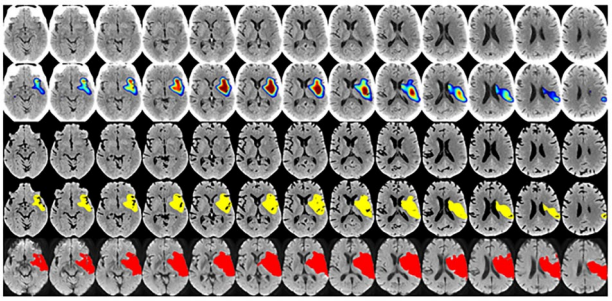

Figure 1. Example of core undercall. From top to bottom row: NCCT, rNCCT heat map, CTP core, union lesion and follow-up DWI lesion. In this patient, the CTP core volume was 0 mL, the rNCCT volume was 56 mL and the final infarct volume was 105 mL. Abbreviations: NCCT = non-contrast CT, rNCCT = relative non-contrast CT, CTP = CT perfusion, DWI = diffusion-weighted imaging.

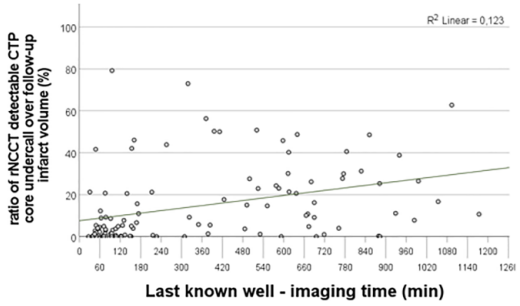

Figure 2. Proportion of undercalled infarct volume by CTP ischemic core (false negative CTP core volume) that is detectable by rNCCT as a function of time. The proportion of false negative CTP core volume detectable with rNCCT increases over time (Pearson's correlation coefficient = 0.35 [95%CI = 0.17-0.51], p < 0.001). *Abbreviations: CTP = CT perfusion; rNCCT = relative non-contrast CT; DWI = diffusion-weighted imaging.*

Disclosure of interest: No

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Clinical Characteristics Associated with Acute Ischemic Signs on Non-contrast Computed Tomography

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Background and aims: Non-contrast brain CT (NCCT) remains the routine imaging test for stroke patients to exclude intracranial hemorrhage, but the detection of early ischemia is low. We explored the clinical factors associated with the presence of acute ischemic signs (AI-signs) on NCCT among participants in the alteplase-dose arm of the ENCHANTED trial.

Methods: ENCHANTED assessed the effects of low- versus standard-dose intravenous alteplase in acute ischemic stroke patients. All collected NCCT scans were assessed centrally by an imaging analysis team of trained individuals blind to clinical data using an electronic scoring system modified from the IST-3 trial. Logistic regression models were used to assess associations of clinical factors with AI-signs on baseline NCCT after covariables like time from stroke onset to NCCT scan adjustment.

Results: Among 2458 patients (mean±SD [range] age 67±13 [20-100] years, 38.3% female), there were 571 with AI-signs. Asians (adjusted odds ratio 1.41; 95% confidence interval 1.15, 1.72) and high NIHSS score (1.08; 1.07, 1.10) were independently associated with the presence of any AI-signs, hypoattenuation, or swelling. High NIHSS score (1.15; 1.11, 1.19) and low baseline systolic blood pressure (0.99; 0.97, 1.00) were independently associated with large ischemic lesions. High NIHSS score (1.10; 1.08, 1.12), atrial fibrillation (1.62; 1.26, 2.07), no prior stroke (0.66; 0.48, 0.99) and no diabetes mellitus (0.68; 0.47, 0.98) were independently associated with hyperattenuated arteries.

Conclusions: Specific clinical information related to the presence of AI-signs may help clinicians avoid overlooking early infarct change whilst reviewing the NCCT in their patients.

Disclosure of interest: No

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Computed Tomography Perfusion (CTP) predictors of hemorrhagic transformation after mechanical thrombectomy (MT): Implications for post thrombectomy care

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Background and aims: Hemorrhagic Transformation (HT) is a major complication of mechanical thrombectomy (MT) associated with higher morbidity and mortality. The aim of this study is to identify CTP predictors of post-MT HT.

Methods: National Institutes of Health Stroke Scale (NIHSS), ASPECTS, mTICI scores, infarct core, Tmax and mismatch volumes, hypoperfusion index ratio (HIR), HT (ECASS III) on immediate post-MT imaging were retrospectively collected in patients undergoing MT between 01/2021 and 01/2022. Comparisons were made between HT vs non-HT and early (defined as <12h post-MT) vs. late (>12h) HT groups.

Results: We analyzed 272 adult patients with acute ischemic stroke treated with MT. 145 (53.3%) patients had HT (HI 40.6%, PH 28%, Isolated SAH 36.5%). Occurrence of HT was associated with higher NIHSS score (12 [IQR 6,19] vs. 9 [IQR 4,17], p=0. 029), lower ASPECTS (9 [IQR 7,10] vs. 9 [IQR 8,10], p=0.008), larger CTP core volume (ml) (11 [IQR 0,26] vs. 5 [0,16], p=0.034) and lower (0-2B) mTICI scores (p<0.001). After adjustment, NIHSS (OR=1.035, 95% CI 1.002-1.069, p=0.035) and mTICI (OR=0.684, 95% CI 0.508-0.919, p=0.012) scores remained independently associated with post-MT HT. Larger core volume

(ml) 13.5 [IQR 0,46] vs. 7.5 [IQR 0,17.5], p=0.016), larger area of Tmax>10 sec (35.5 [IQR 12,75] vs. 20.5 [IQR 6.5, 41.5], p=0.018) and higher HIR (0.5 [IQR 0.2, 0.6] vs. 0.3 [IQR 0.1, 0.45], p=0.009) were associated with late-occurring post-MT HT.
Conclusions: CTP parameters on initial imaging are associated with late post-MT HT and may help identify patients requiring more intensive post-MT monitoring.
Disclosure of interest: No

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Gadolinium leakage into ocular structures as a marker in stroke: a retrospective analysis of the WAKE-UP trial

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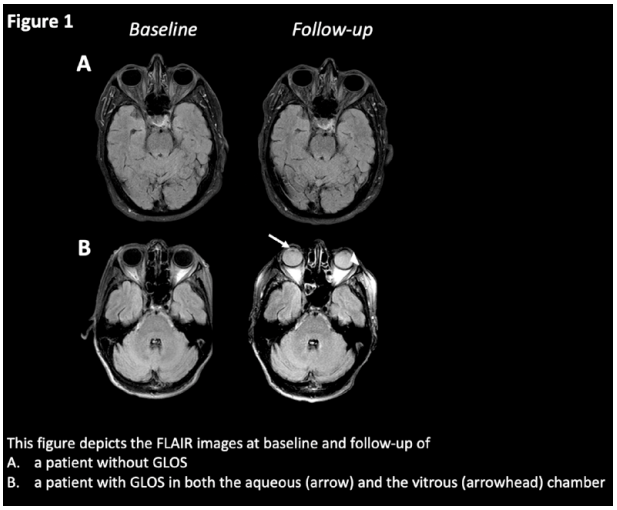
Background and aims: Blood-brain barrier disruption in acute ischemic stroke is a well described phenomenon associated with hemorrhagic complications. The *hyperintense acute reperfusion marker* (HARM) represents gadolinium leakage in the cerebrospinal fluid and *gadolinium leakage into ocular structures* (GLOS) might represent a dysfunction of the blood-ocular barrier. Here we studied the presence of GLOS in the WAKE-UP trial and its association with HARM, hemorrhagic transformation (HT) and poor functional outcome (modified Rankin scale 3-6).
Methods: Randomized patients from the WAKE-UP trial who received gadolinium at baseline, for perfusion weighted imaging, and fluid attenuated inversion recovery (FLAIR) imaging at both baseline and follow-up, were included. GLOS was visually defined in patients as an increase in intensity on FLAIR imaging in the aqueous and/or vitreous fluid between baseline and follow-up **(Figure 1)**.
Results: We could include 192/504 (38.1%) of the randomized WAKE-UP patients. GLOS was detected in 56 (29.2%) cases. GLOS positive patients were older (73 IQR (68-75) vs 65 (IQR 63-68) y, $p<0.01$), had a lower glomerular filtration rate (GFR 79.5 (IQR 70-88) vs 87.2 (IQR 83-91 ml/min; $p = 0.01$) and less often presented with a large vessel occlusion (26.8% vs 44.1%, p=0.02). We identified HARM more often in GLOS positive patients (16.1% vs 2.9%; $p<0.01$). The presence of GLOS was not associated with HT nor with poor functional outcome.
Conclusions: GLOS is a frequent finding in ischemic stroke patients and is associated with HARM, age, and renal function but not with HT or functional outcome.



This figure depicts the FLAIR images at baseline and follow-up of
A. a patient without GLOS
B. a patient with GLOS in both the aqueous (arrow) and the vitrous (arrowhead) chamber

Disclosure of interest: No

IMAGING – HYPERACUTE

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Diffusion-Weighted Imaging for the Identification of Acute Central Retinal Artery Occlusion - Results from a Bicentric Cohort Study

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Background and aims: To investigate the utility of diffusion-weighted imaging (DWI) for the early diagnosis of acute central retinal artery occlusion (CRAO).
Methods: Consecutive CRAO patients with DWI performed within 24 hours after onset of visual impairment were included in a bicentric, retrospective cohort study. Scans were assessed for the presence of retinal ischemia (retinal restricted diffusion, RDR) by two blinded neuroradiologists. We evaluated detection rates of RDR in CRAO, false positive ratings and interrater agreement.
Results: Sixty-eight CRAO patients (68.4 $\pm$ 16.8 years; 25 female) with 72 DWI scans (76.4% 3T, 23.6% 1.5T) were included. Mean time-delay between onset of visual impairment and DWI acquisition was 13.4 $\pm$ 7.0h. Overall RDR detection rates ranged from 52.8-62.5% with false positive ratings in 4.2-8.3% of cases. RDR detection rates were higher in DWI performed 12-24h after onset, when compared with DWI acquired within the first 12h (79.5% vs. 39.3%, $p < 0.001$). The share of false positive ratings was highest for DWI performed within the first 6h of CRAO (up to 14.3%). Interrater reliability was "moderate" for DWI performed within the first 18h ($\kappa = 0.57$-0.58), but substantially improved for DWI acquired between 18- 24h after onset ($\kappa = 0.94$).
Conclusions: The diagnostic utility of DWI resonance imaging in the setting of early CRAO improves with increasing time interval between onset of visual disturbance and image acquisition. Future, prospective studies with improved technical protocols are required to explore the full potential of retinal DWI in hyperacute CRAO.
Disclosure of interest: No

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Hypoperfusion intensity ratio: An automated tool to predict failed reperfusion

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Background and aims: In the era of endovascular treatment of acute ischaemic stroke, a patient-tailored thrombectomy must be the goal in order to achieve successful reperfusion, thereby improving clinical outcomes. We aimed to explore automated CT perfusion parameters and analyze their value to predict endovascular treatment outcomes.
Methods: We performed a retrospective cross-sectional study of consecutive patients with stroke treated with EVT from January 2020 to April 2022. We included isolated intracranial LVO occlusions (internal carotid, segments 1-2 of middle cerebral artery, vertebral and/or basilar arteries). We described CTP automated parameters (such as hypoperfusion intensity ratio, a good surrogate of collateral circulation, defined as Tmax>10s/Tmax>6s ratio - HIR), presence of occlusion-related intracranial artery calcifications (IAC), and clinical features in order to evaluate its capability to predict failed reperfusion (eTICI 0-2a).
Results: Of 363 patients included, 60 patients (16.5%) did not achieve a successful reperfusion before the use of rescue treatments (intracranial angioplasty and/or stent placement). After adjusting for identifiable confounders, HIR<0.25 (OR 4.12, 95%CI 2.14-7.94, p<0.001) and occlusion-related IAC (OR 3.88, 95%CI 1.42-10.60, p=0.008) were independently associated with higher odds of failed reperfusion. Occlusion location, ASPECTS or intravenous fibrinolysis did not significantly modify reperfusion rates.
Conclusions: An hypoperfusion intensity ratio lower than 0.25 can help to predict failed reperfusion, suggesting underlying intracranial atherosclerotic disease. This approach could select patients with an acute LVO occlusion that require a more intensive endovascular treatment strategy, including mechanical or pharmacological rescue treatments
Disclosure of interest: No

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A deep learning approach to classification of posterior circulation stroke using CT perfusion data

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Background and aims: Clinical diagnosis of posterior circulation stroke (PCS) is challenging despite advances in imaging. Optimal CT perfusion (CTP) core/penumbra thresholds have been validated using anterior circulation stroke and recent studies suggest that they are unsuitable for PCS. We aimed to develop a convolutional neural network (CNN) to classify PCS using CTP imaging.
Methods: High-resolution CTP-derived maps (MIStar; Apollo Medical Imaging) from participants in the International Stroke Perfusion Registry (8 scanners from 4 manufacturers across 14 sites) in patients with PCS defined as a visible CTP deficit and follow-up DWI lesion within the posterior circulation territory were included. All other participants were included into a reference group out of which a random selection was taken (1:4 PCS-reference ratio). A 3D-DenseNet was trained to classify participants into a PCS and reference group (70:30 testing-training ratio).
Results: 88 participants with PCS were included (median age: 69 with interquartile range [60-78]; NIHSS at baseline: 8 [5-14]; DWI lesion volume: 3 [0.6-16] ml). 352 participants from INSPIRE were used as the reference group (median age: 72.5 [61-80.8]; NIHSS at baseline: 12 [6-17]; DWI lesion volume: 15.1 [3–50] ml). An accuracy of the 3D-ResNet deep learning model of 0.89 was achieved using Delay Time (sensitivity: 0.77; specificity: 1). Mean Transit Time and Cerebral Blood Flow yielded lower accuracies, 0.83 (sensitivity/specificity: 0.61/0.97) and 0.80 (sensitivity/specificity: 0.51/0.97), respectively.
Conclusions: Classification of PCS using CNNs is highly accurate, particularly when using Delay Time maps. Future directions include a prospective clinical study to validate model performance.
Disclosure of interest: No

IMAGING – HYPERACUTE

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Sensitivity of native-phase cranial CT (NCCT) compared to fluid attenuated inversion recovery (FLAIR) - MRI for detection of early signs of infarction in acute stroke

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Background and aims: Selection of imaging modality is a substantial challenge in acute ischemic stroke. Currently, MRI-FLAIR/diffusion weighted imaging (DWI) is discussed as being more sensitive for early signs of stroke than NCCT. In clinical practice, we repeatedly observed that early signs of ischemia were detectable in the NCCT and in DWI, but not in FLAIR-imaging. We performed an imaging analysis of acute stroke patients who received an NCCT and an MRI within a short time interval to evaluate the diagnostic accuracy of NCCT and FLAIR in comparison to gold standard DWI.
Methods: We retrospectively analysed NCCT and MRI images of 65 patients with anterior circulation acute ischemic stroke, who first underwent an NCCT and thereafter an MRI at Hannover Medical School between January 2017 and March 2020. Two neuroradiologists and two neurologists assessed Alberta Stroke Program Early Computed Tomographic Scoring (ASPECTS) of MRI-FLAIR and NCCT, separately, blinded for the gold standard DWI-ASPECTS, which was assessed by a senior neuroradiologist.
Results: Full-scale agreement was nominally higher for NCCT-ASPECTS (intraclass correlation coefficient CT vs. FLAIR: 0.88 (95%CI 0.82-0.92) vs 0.79 (95%CI 0.67-0.87)). For dichotomized ASPECTS (⩽7 vs >7) the AUC for NCCT- (0.72 (95%CI 0.64-0.81)) was equal to AUC for FLAIR-ASPECTS (0.71 (95%CI 0.61-0.81)) both compared to MRI-DWI-ASPECTS (AUC-difference NCCT-FLAIR: 0.013 (95%CI -0.07-0.10)).
Conclusions: Our data suggest that NCCT is as sensitive as the FLAIR-sequence in detection of early signs of ischemia. In consequence acute stroke imaging could be simplified in favour for NCCT - "back to the roots".
Disclosure of interest: No

IMAGING – HYPERACUTE

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Regional leptomeningeal collateral score versus hypoperfusion intensity ratio in large vessel occlusion

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Background and aims: The regional Leptomeningeal Collateral [rLMC] scale is a 20-point score based on collateral opacification of anatomic ASPECTS regions. Hypoperfusion intensity ratio (HIR) is an alternative index of collaterals on CTP. We compared rLMC scores and HIR, and their prognostic value.
Methods: We analysed patients imaged <24h after symptom onset in a prospective observational single-centre study. Two experienced assessors categorised arterial occlusion sites and scored rLMC on CTA. HIR (Tmax >10s / Tmax>6s volume - rounded to the nearest 0.1) was obtained from CTP processed by RAPID (version 4.7 Ischemaview). High HIR was defined as >0.2. Binary logistic regression modelling for day 90 good (mRS<3) and excellent outcomes (mRS <2) adjusted for age, thrombolysis, and onset to CTP time explored HIR and rLMC separately.
Results: We selected 95 patients with LVO and evaluable imaging. Correlation between HIR and rLMC was significant (Spearman's rho -0.432, p<0.001). Day 90 mRS 0-2 was significantly associated with rLMC score (OR 1.16 [1.04-1.29], p=0.006) but not HIR (OR 0.45 [0.007-2.997], p=0.411). rLMC remained associated when both HIR and rLMC were included in the model (OR 1.17 [1.04-1.32], p=0.009). Day 90 mRS 0-1 was significantly associated with rLMC (OR 1.13 [1.00-1.26], p=0.049) but not HIR (OR 0.27 [0.03-2.22], p=0.224).
Conclusions: In patients with LVO imaged within 24h of onset, good collateral status assessed by rLMC score was significantly associated with favourable day 90 outcome after stroke.

Table 1: Clinical Characteristics (N=95)

Age (mean, sd) (years)	67 (14)
Gender (n, % male)	56 (59)
Wake-up (n, %)	25 (26)
Pre-stroke good function (mRS≤2) (n, %)	90 (95)
Baseline NIHSS (median, IQR)	8 (9)
Onset to CTP (median, IQR) (hours)	3.6 (9.4)
Received thrombolysis (n, %)	57 (60)

n=number, sd=standard devation, mRS=modified Rankin scale, NIHSS=National Institutes of Health Stroke Scale, IQR=interquartile range, CTP=computed tomography perfusion

Disclosure of interest: No

IMAGING – HYPERACUTE

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'No-reflow' despite complete recanalization: re-appraisal from a comprehensive review

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Background and aims: Impaired microcirculation despite complete recanalization ('no-reflow') after LVO anterior circulation stroke may partly account for 'futile recanalizations'. Reported incidence of no-reflow has varied widely, likely reflecting differences in recanalization assessment - notably given the evolving TICI grading scheme - and no-reflow operational definition, resulting in some confusion. Although designating the TICI 2c and 3 categories has clarified matters, eTICI2c and mTICI-2c -defined as reperfusion ⩾90% and near-complete perfusion save for slow flow or emboli in a few distal cortical vessel on DSA, respectively- do not equate total recanalization, and accordingly post-thrombectomy hypoperfusion in TICI-2c may not always reflect no-reflow. Additional confounding factors include carotid stenosis, re-occlusion and post-thrombectomy hemorrhage.
Methods: We selected from the literature studies assessing brain perfusion early after thrombectomy and reporting no-reflow separately following TICI-2c vs TICI-3 recanalization.
Results: We identified 5 articles (DOI: 10.1177/0271678X20954929; 10.1212/WNL.0000000000013210; 10.1161/STROKEAHA.121.034581; 10.1002/ana.26474; 10.1161/STROKEAHA.122.040063; https://n.neurology.org/content/reader-response-prevalence-and-significance-impaired-microvascular-tissue-reperfusion), altogether reporting 553 patients. Random-effects meta-analysis pooled prevalence of hypoperfusion was 17.6% (95%CI: 12.9%-22.8%) in mTICI2c and 12.9% (95%CI: 0.0%-40.5%) in mTICI3 patients. mTICI score (2c vs. 3) was significantly associated with hypoperfusion (OR 2.23 (95%CI: 1.34-3.71, Peto's method). No study reported the impact of no-reflow on functional outcome separately for TICI-3 patients.
Conclusions: Given the very definition of TICI-2c, the true no-reflow incidence in this category remains unclear. Regarding no-reflow in TICI-3, its incidence appears rare and may have been overestimated as all or some potential confounders were not excluded in some studies, while its impact on functional outcome remains unstudied.
Disclosure of interest: No

IMAGING – HYPERACUTE

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INFARCT CORE ANALYSIS WITH RAPID CT PERFUSION SOFTWARE: THE CLINICAL RELEVANCE OF GHOST INFARCTION CORE AND EXPANSIVE CORE

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Background and aims: The concept of ghost infarction core(GIC) has been described as the overestimation of the infarction core(IC) in CT perfusion(CTP) compared to the final injury. We aim to evaluate the clinical impact of GIC compared to expansive core(EXC), using automated RAPID®CTP(RAPID) software.
Methods: Retrospective observational study of patients with acute ischemic stroke due to occlusion of the MCA or carotid terminus treated with endovascular mechanical thrombectomy, with scan images processed by RAPID. The correlation between the estimated IC by RAPID with 24h follow-up infarct volume(24h-INF) and the frequency of GIC(defined as overestimation of IC>10mL) and EXC(defined as underestimation of IC>10mL) were studied.

Results: N=115, mean age 72.67(13.65), 44.3% women. Mean time from start to CT 132 min(110), mean 24h-INF 20.86mL(36.7). The correlation of IC with 24h-INF was higher with RAPID parameter CBV<42%(rho spearman=0.55;p<0.001) vs CBF<30%(rho=0.49;p<0.001). GIC was identified in 24 subjects(20.9%). The GIC group showed significantly shorter(<2h) time interval from onset to CTP scan(p=0.02). There was no association identified between GIC and 24h-INF or prognostic factors such as mRS at 3 months and mortality.
EXC was identified in 24 patients(20.9%) and was associated with DM(p=0.035), hyperglycemia(p=0.033) and ipsilateral intracranial stenosis(p=0.041). Among prognostic factors, they presented higher 24h-INF(p<0.001), mRS at 3months(p<0.001), and mortality(p<0.001).
Conclusions: In our study, the GIC was relatively frequent using RAPID(especially in patients with <2h of evolution), and its interpretation could be useful in the clinical management. The EXC appeared with the same frequency, but its clinical utility might be higher, showing association with a worse prognosis.
Disclosure of interest: No

IMAGING – HYPERACUTE

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Radiological evolution of cerebral venous thrombosis in the acute and subacute phases: V-POSITIVE study

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Background and aims: The radiological evolution of cerebral venous thrombosis(CVT) has been scarcely studied in its acute/subacute phase,although its knowledge could have a clinical impact.The objective of this V-POSITIVE study(Valoration of PrOgreSsion In cErebral Venous Thrombosis)is to assess said evolution and to explore its prognostic value.
Methods: Multicentric,observational and retrospective study with prospective data collection.Data were obtained from patients suffering from CVT in 4 stroke units from Madrid,Spain,from 2008 until 2022,whose radiologic and angiographic control images were available in the first 14 days.Clinical characteristics and prognosis estimated by mRS at 3 months were collected.The radiological evolution was defined as improvement(RI) if there was angiographic tendency to improvement,worsening(RW) if there was thrombosis progression or parenchymatous lesions,and stability(RS) if no changes were recorded.
Results: N=80.Mean age 47,5 years(SD 19,3); 55% women. Mean time to radiological control was 4.9 days(SD 3,6).Evolution was as follows:RI in 20%,RW in 43,8% and 36,3% and RS in 43,8% of cases.Imaging follow-up was perfomed later in RI cases with an average of 7 days(5-8) vs in RW with 3 days(2-5)(p=0,002).Both RW and RS were associated to venous infarct(p=0,032) and edema(p=0,002).36 cases had available imaging follow-up in the first 72 hours,presenting the following evolution:RI 2.8%, RW 44,4% and RS 52.8%.
Conclusions: In our study radiological improvement in CVT cases was identified around a week from onset,it being associated to younger age and better prognosis.Stability and worsening were linked to venous infarction and edema,which were identified in a broader temporal margin,even the first 72 hours.
Disclosure of interest: No

IMAGING – HYPERACUTE

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Hyperintense Acute Reperfusion Marker Sign in Patients with Transient Ischemic Attack

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Background and aims: The hyperintense acute reperfusion marker (HARM) is known as a delayed enhancement of cerebrospinal fluid on FLAIR images, and it is supposed to indicate a blood brain barrier disruption in acute stroke. HARM with or without the hyperintensities on DWI is occasionally found in patients with TIA. Our study was to determine the prevalence of HARM sign in TIA patients and to identify the characteristics of HARM-positive patients.
Methods: From JAN 2015 to JUN 2019, we included the patients who had TIA and underwent MRI including DWI and gadolinium-enhanced FLAIR sequences within 7 days after onset from our prospective registry. We then identified the presence of HARM sign in the relevant brain region.
Results: We identified a total of 269 consecutive patients from our registry. DWI lesions were found in 43 patients (16.0%), and 25 patients (9 with DWI lesion and 16 without DWI lesion) had HARM sign corresponding to the neurological symptoms. Previous history of TIA was more frequent in HARM(+) group rather than HARM(-) group (32.0% vs. 8.2%, p=0.002), and the number of patients with symptom less than 60 minutes was higher in HARM(+) group than HARM(-) group (68.0% vs. 34.4%, p=0.001). Other demographic and clinical characteristics were similar between these groups.
Conclusions: The observation of HARM sign can help to confirm the true ischemic TIA patients. In addition, recurrent TIA and early recovery could be predicted in patients with HARM sign. Further studies including more patients are needed to confirm our observation.
Disclosure of interest: No

IMAGING – HYPERACUTE

2022

Predicting thrombi histopathologic composition in acute basilar artery oclussion through CT image features: a review and guide for the radiologist

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Background and aims: Bibliography indicates that there are certain imaging characteristics in basal tomography and angio-tomography that point towards a certain composition of thrombi in acute arterial occlusions. The objective of this study is to review these findings and to correctly quantify and characterize them.

Methods: Bibliography on how to perform a correct reading of thrombi image characteristics on both non-contrast CT and Angio CT was gathered, and a review was made on which of them were useful for the prediction of thrombus histology. These techniques were subsequently applied in retrospective readings in studies at our center.
Results: We selected all patients over 18 years of age who suffered a stroke involving the basilar artery in our hospital during 2017-2021. A retrospective reading of the multimodal CT images upon admission was performed, following the suggestions and steps for a correct reading suggested by bibliography. The purpose of this review is to create a consensus or protocolized guide on how to correctly characterize thrombus images in CT studies and thus be able to make a better diagnostic approach. Characteristics such as density, length, ROIs and others are vital in this regard and it is necessary to know how to manage them.
Conclusions: Tomography is a useful tool that allows determining, based on imaging characteristics, the probable histological composition of thrombi in basilar artery occlusions. Baseline CT images as well as CTASI and other signs, such as hyperdense artery, are some of the useful tools mentioned in this review.
Disclosure of interest: No

IMAGING – HYPERACUTE

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DETERMINANTS OF LEPTOMENINGEAL CEREBRAL COLLATERALS IN PATIENTS WITH ACUTE ISCHEMIC STROKE AND LARGE VESSEL OCCLUSION

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Background and aims: Leptomeningeal cerebral collaterals (LCC) have a pivotal role in acute ischemic stroke (AIS), but their pathophysiology has been scarcely understood. We explored factors associated with collaterals in patients with AIS.
Methods: We retrospectively reviewed data of patients with AIS and Internal Carotid Artery and/or Middle Cerebral Artery occlusion regardless of reperfusion treatment. LCC grade was scored according to the Menon Score (MS) into good and poor (MS $\geq$4 and $<$4, respectively). Logistic regression models were used to investigate independent associations between selected determinants and LCC grade.
Results: We enrolled 335 patients, mean age 74.5 (SD: $\pm$13.6) years, 147 (43.9%) males, median NIHSS 18 (IQR 13-23), median ASPECTS 8 (IQR 6-9), 206 (62%) with good LCC. In logistic regression analysis, age, sex, vascular risk factors, use of antihypertensives, statins, antithrombotic drugs did not influence LLC, except for previous strokes/TIA that were associated with poor LCC (OR=0.44;95%CI=0.23-0.85). Higher ASPECTS (OR=1.61; 95%CI=1.35-1.92), lower NIHSS (OR=0.95;95%CI=0.91-0.99), and left hemispheric stroke (OR=2.13;95%CI=1.19-3.79), were associated with higher odds of good LCC. Only higher ASPECTS was associated with good LCC after 6 hours from onset (OR=2.11;95%CI=1.26-1.86).
Conclusions: This study confirms protective role of LCC on the severity of ischemia. In recent years several studies investigated LCC determinants with not conclusive results. Our study did not find factors influencing LCC. Previous events seem to contrast, whereas involvement of the dominant hemisphere to favour LCC development. These findings deserve further exploration and may help to better understand LCC pathophysiology.
Disclosure of interest: No

IMAGING – HYPERACUTE

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DETECTION OF HYPOPERFUSION DURING ACUTE ISCHAEMIC STROKE USING DYNAMIC CT ANGIOGRAMS

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Background and aims: In acute ischaemic stroke (AIS), multiphase CT angiograms (mCTA) can provide similar perfusion information as CT perfusion (CTP) acquisition with reduced radiation dose and operating expenses, while being more generalizable to existing CT infrastructure. This work evaluates two machine learning (ML) models for the identification of hypoperfusion using mCTA.
Methods: The three phase mCTA was analyzed using the SPIRAL method. Two ML models were assessed in the current work: 1) random forest (RF) and 2) extreme gradient boosting trees (XGB). CTP T-MAX quantitative maps were thresholded at 9.9s to create a penumbra reference standard. An atlas was used to evaluate the models in different vascular regions. An 80/20 split between training and testing sets was applied to the data set to produce AUCs and independently tested accuracies.
Results: A 295 AIS patient dataset was used that included mCTA and CTP (median age = 71 – SD = 15, 54.5% male, median NIHSS = 11 – SD= 8). The performance of the XGB and RF models varied based on vascular territory as indicated by the AUCs and accuracies (Table-1).
Conclusions: The SPIRAL perfusion maps generated by RF and XGB can accurately predict penumbra perfusion deficits compared to CTP T-MAX.

Table 1. AUCs and accuracies for each model & vascular region.

AUC (accuracy)	Middle Cerebral Artery (MCA)	Anterior Cerebral Artery (ACA)	Posterior Cerebral Artery (PCA)	Basal Ganglia (BG)	Cerebellum (CB)
RF	0.861(0.77)	0.80(0.68)	0.759(0.655)	0.868(0.751)	0.867(0.758)
XGB	0.843(0.795)	0.847(0.732)	0.842(0.691)	0.844(0.791)	0.838(0.752)

Note: Accuracies in

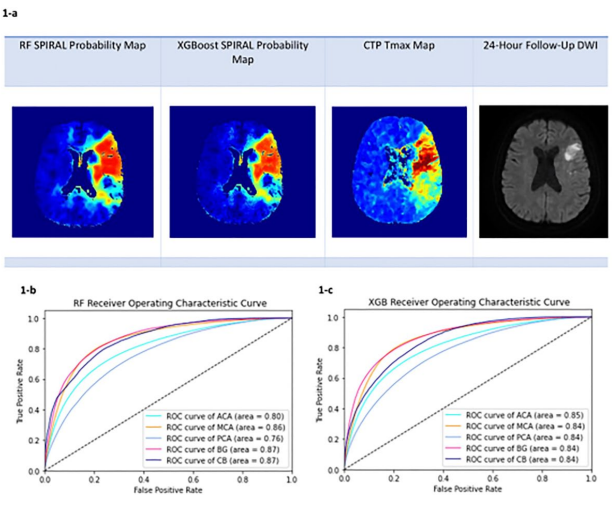

Figure 1-a. Example perfusion maps for each model of one patient compared to CTP maps and follow-up DWI imaging. Figure 1-b. ROC AUC curve for each vascular territory for the RF model. Figure 1-c. ROC AUC curve for each vascular territory for the XGB model

Disclosure of interest: No

IMAGING – HYPERACUTE

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Multi-centre comparison of artificial intelligence-based detection of large vessel occlusion and neuro-radiologist reporting

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Background and aims: The identification of large vessel occlusion (LVO) on CT angiograms (CTA) is vital in order to identify suitable patients for mechanical thrombectomy. Several UK hospitals are using artificial intelligence CTA decision aid tools (Brainomix) for this purpose. This study combines the data from two non-thrombectomy acute stroke centres to assess the performance of the algorithm in a representative prospectively analysed NHS cohort.
Methods: Consecutive patients who underwent a CTA for suspected stroke over a 12 month period in one centre and a 6 month period in the other were included. The e-CTA output was compared with the final neuro-radiology report, considered the ground truth.
Results: Four hundred and three CTAs were included in the study after excluding scans with posterior circulation events and those of poor quality. The mean age was 71.4 years; females 42%. The prevalence of LVO in this cohort was 25%. Neuro-radiologists reported 101 LVOs and e-CTA identified 80 of these cases. The number of false positives was 26 (6.5%). The sensitivity of e-CTA was 79% and specificity 91%. In this cohort, e-CTA had a PPV of 75% and a NPV of 93%. When analysed separately the results were similar in both centres.
Conclusions: In this real-life representative multi-centre cohort, e-CTA performance was consistent with that observed in previous validation studies. The high sensitivity and specificity values make e-CTA a useful decision support tool for identifying large vessel occlusion by the stroke physician in the emergency context.
Disclosure of interest: No

IMAGING – HYPERACUTE

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Artificial Intelligence based nationwide centralized decision supporting system for improving stroke care efficiency in Hungary

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Background and aims: Completion and interpretation of imaging studies may delay treatment and negatively impact outcome following Mechanical Thrombectomy. The purpose of this study is to demonstrate the feasibility of building a nationwide stroke imaging network providing fast automated image analysis for all stroke centers of the country using Artificial Intelligence (AI).
Methods: A total of 28 stroke centers including 24 primary and 4 comprehensive ones were incorporated within the same teleradiology network (eRAD, Hungary). CT scans completed under an acute stroke protocol are automatically transmitted through the network to a central server which applies an AI based software (eStroke, Brainomix Ltd.) to analyze native CT-s, CT Angiograms and CT Perfusion studies providing ASPECT scores, Large Vessel Occlusion site (LVO), collateral score and standard CTP parameters. Both numerical data and interpreted images are transmitted back in an anonymized fashion to the sender and to the relevant thrombectomy center simultaneously via a secure network within $<$ 15 minutes. All results become immediately available via PACS and through the cloud by desktop computer or mobile application.
Results: The required technical, legal and data protection preparations were completed within 4 months and the system was installed in another 2 months. From October till December a total of 5924 scans on 2290 cases were processed by the system.
Conclusions: Using AI based centralized stroke imaging network fast and reliable decision support can be provided to a large nationwide stroke care system. The system was installed with the support of an EU grant EFOP 5.2.6.
Disclosure of interest: Yes

IMAGING – HYPERACUTE

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CORRECT-CTP: A CORRELATIONAL ANALYSIS OF ISCHEMIC CORE VOLUMES FROM NON-CONTRAST CT AND CT-PERFUSION

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Background and aims: We investigated whether the infarct core (IC) in acute ischemic stroke (AIS) can be estimated from non-contrast CT (NCCT) using the e-Stroke software (Brainomix, UK) as opposed to CT perfusion (CTP).
Methods: We retrospectively identified patients who presented between 2016 and 2019 with suspected AIS to a primary stroke center and had NCCT and CTP at presentation. CTP was processed with RAPID (iSchemiaView, USA) to determine the IC and NCCT with e-Stroke (Brainomix) to determine the acute ischemic volume (AIV). Diffusion weighted MRI (DWI) within 7 days from onset was used to determine the final infarct volume (FIV).
Results: We included 375 patients; in 170 of these the presence and location of infarcts were detected and located correctly by both methods. IC and AIV strongly correlated in these patients (16 + 32ml vs 12 + 21ml; r=0.79; $p<0.01$). In 83/170 patients where DWI was available, the IC (13 + 25ml; r=0.93) and AIV (12 + 20ml; r=0.79; $p<0.01$, each) correlated strongly with the FIV (34 + 69ml). 70/83 patients exhibited either no relevant CTP mismatch ($<$20%) initially or showed early neurological improvement i.e., a reduction in NIHSS of at least 4 points. In this subgroup the correlation with FIV (28 + 57ml) further increased for IC (13 + 24ml; r=0.96) and AIV (12 + 19ml; r=0.84; $p<0.01$, each).
Conclusions: Estimates of the ischemic core from CTP and NCCT show strong correlations with each other and with final infarct volume, especially in patients unlikely to have progressive infarction.
Disclosure of interest: Yes

IMAGING – HYPERACUTE

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Automated Assessment of DWI-FLAIR Mismatch in Patients with Acute Ischemic Stroke: Added Value to Routine Clinical Practice

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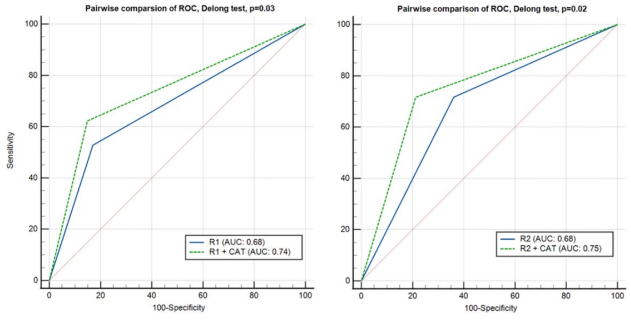
Background and aims: DWI-FLAIR mismatch is used to determine thrombolytic eligibility in patients with acute ischemic stroke (AIS) when time-to-stroke symptom (TSS) is unknown. Commercial software packages for automated classification of TSS have been developed. We aimed to assess the potential added value of such a tool in assessment of diagnostic performance of neuroradiologists in determination of TSS in a cohort of patients with AIS.

Methods: In this retrospective study, patients with AIS who had pretreatment MRI and known TSS were included. DWI-FLAIR module V1.0 (Olea Medical) was used to classify DWI-FLAIR mismatch by automatic segmentation of infarct and quantification of FLAIR signal intensity ratios. Two expert neuroradiologists (R1, R2) blinded to TSS independently assessed the DWI-FLAIR mismatch status. In a separate experiment (4 weeks later), the neuroradiologists reevaluated the DWI-FLAIR status this time by using the automated predicted results as a computer assisted tool (CAT) to help their interpretation. TSS was dichotomized using a 4.5 hr cutoff to assess the diagnostic performance of the neuroradiologists with and without CAT.

Results: Among 100 patients included, TSS $\geqslant$ 4.5 in 47 patients and $<$ 4.5 hrs in 53. Diagnostic performance (sensitivity/specificity/accuracy %) for determination of TSS using DWI-FLAIR mismatch was 53/83/68 for R1 and 72/64/68 for R2. Using automated predictions as CAT, diagnostic accuracies of neuroradiologists were significantly improved (sensitivity/specificity/accuracy %): 62/85/73.5% for R1 (p=0.03) and 72/79/75.5% for R2 (p=0.02) (Figure).

Conclusions: Automated quantitative approach for DWI-FLAIR mismatch can improve diagnostic accuracies of expert neuroradiologists in determination of TSS.



Disclosure of interest: Yes

IMAGING – HYPERACUTE

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LARGE VARIATIONS IN LOCALIZATION AND QUANTIFICATION OF THE ISCHEMIC CORE IN ACUTE ISCHEMIC STROKE BETWEEN DIFFERENT COMMERCIAL CT PERFUSION SOFTWARE PRODUCTS

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Background and aims: CT perfusion (CTP) can be used to assess the ischemic core (IC) in acute ischemic stroke (AIS) and is recommended by international guidelines for indication of recanalizing therapies in patients presenting late. Several commercial products which offer a fully automated CTP analysis are available.

Methods: We compared IC values for ischemic core from 4 commercially available software packages for CTP analysis: RAPID (A; iSchemiaView), eCTP (B; Brainomix), OleaSphere (C; Olea) and Neuro (D; TeraRecon) in 695 patients who presented between 2014 and 2018 with suspected AIS to a primary stroke center. We calculated the side-specific sensitivity and specificity with regard to the clinical prevalence as well as receiving-operator-characteristics (ROC) and correlation coefficients for core volumes.

Results: Sensitivity, specificity and areas under the curve (AUC) differed considerably between the products. Products A and B had a higher specificity than C & D, C & D had a higher sensitivity. This resulted in similar AUC values for A, B & C (0.7, 0.7 & 0.7, respectively) compared to D (0.5). When including only AIS cases with large vessel occlusions (LVO) the AUC improved only for A & B (0.8, both), but not for C & D. In 123 cases where all products located the core correctly, absolute values showed correlations between 0.94 (A vs B; p=0.01) and 0.67 (C vs D; p=0.01).

Conclusions: The correct localization and quantification of the ischemic core differs considerably between different commercial products. This should be taken into account when using this method.

Disclosure of interest: Yes

IMAGING – HYPERACUTE

1166

A NOVEL CT ANGIOGRAPHY AUTOMATED DETECTION TOOL FOR BASILAR ARTERY OCCLUSION

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Background and aims: Artificial Intelligence (AI)-guided imaging detection tools are increasingly used to identify large-vessel occlusion stroke patients. Despite the severity of basilar artery occlusion (BAO), no detection tool exists for this condition. Automated detection is challenging in the basilar artery due to anatomical variants and the absence of a contralateral vessel for comparison. We aimed to evaluate the performance of a novel CT-Angiography (CTA) automated detection tool for BAO.
Methods: The algorithm was tested using an international multicenter registry including controls, BAO and middle cerebral artery (MCA) stroke patients. CTA images were processed using a development version of Brainomix e-Stroke software. Vessels were segmented using a convolutional neural networks approach. A decision-tree approach was used to detect the presence of BAOs based on: 1)loss of connectivity between basilar artery origin and tip, 2)drop in signal intensity along the vessel, and 3)presence of an anterior circulation large vessel occlusion.
Results: Overall, 152 cases were included to develop the automated detection tool. Among these, 47 subjects presented with BAO, 38 with a MCA occlusion (n=26 proximal, n=12 distal) and 64 with no large vessel occlusion. Sensitivity and specificity for the detection of BAO were 87.2%, 90.5%, respectively. Positive and negative predictive values were 80.4% and 94.1%.
Conclusions: We describe a novel AI-CTA tool that detects BAO with high accuracy. BAO detection is time critical and may be challenging for less experienced readers. This tool may assist clinicians in identifying BAO patients and aid with acute treatment decision-making.

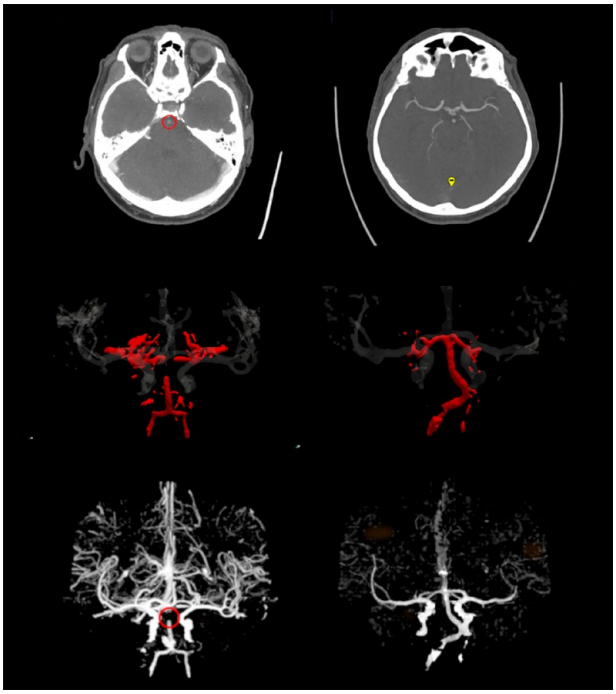

Figure. 1 Examples (left:BAO, right:no-occlusion)

Disclosure of interest: Yes

IMAGING – HYPERACUTE

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AUTOMATED QUANTIFICATION OF ISCHEMIC CORE FOR STROKE THROMBECTOMY USING NON-CONTRAST CT AND CT ANGIOGRAPHY COMPARED TO CT PERFUSION ESTIMATES

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Background and aims: Patient selection for endovascular thrombectomy (EVT) in the late time-window relies on CTP estimates of tissue viability. Limited access to this modality and the delay in treatment introduced by requiring additional scans has fuelled interest in using artificial intelligence to obtain equivalent estimates using more accessible imaging. This study explored the relationship between lesion estimates derived from NCCT, CTA and CTP using automated image analysis.
Methods: Baseline NCCT, CTA and CTP from 161 consecutive patients referred for EVT were processed using e-Stroke (Brainomix, UK) to generate lesion estimates for each imaging modality. NCCT lesion estimates were compared to rCBF estimates of ischemic core. CTA estimates were compared to both Tmax and rCBF derived perfusion deficits as the pathophysiological equivalent is less well established. Comparisons were made in terms of volumetric concordance (intraclass-correlation-coefficient) across multiple CTP thresholds.
Results: NCCT lesion estimates showed greatest volumetric concordance with rCBF maps when using 35% threshold (ICC 0.56). The concordance between CTA and CTP was greater when using a threshold of 12s for Tmax (ICC:0.54) and of 35% for rCBF (ICC:0.56). CTA acquisition-phase significantly ($p<0.001$) affected concordance across modalities. ICC between CTA and CBF, and between CTA and Tmax was respectively greatest at equilibrium (ICC:0.74) and during early arterial phase (ICC:0.62).
Conclusions: Automated image analysis of NCCT and CTA can provide equivalent volume estimates of ischemic core to CTP derived metrics. The ability to extract information on tissue viability from simple imaging might aid patient selections for stroke treatment across more hospitals.

Disclosure of interest: Yes

IMAGING – HYPERACUTE

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PORTABLE, LOW-FIELD MRI FOR WAKE-UP STROKE

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Background and aims: Tissue plasminogen activator (tPA) for acute ischemic stroke (AIS) must be administered within 4.5 hours of symptom onset, yet a subset of patients wake-up with symptoms and time of onset is unknown. Mismatch between fluid-attenuated inversion recovery (FLAIR) and diffusion-weighted imaging (DWI) MRI can be used to qualify wake-up strokes for thrombolytic treatment. In this study, we sought to establish the utility of a low-field (LF), portable MRI system to identify DWI-FLAIR mismatch.

Methods: Patients with a diagnosis of AIS underwent DWI and FLAIR acquisition on a 0.064T MRI (Hyperfine Research Inc.) at $<$6 hours (n=8) and $>$24 hours (n=8) since last known well (LKW). Conventional high-field (HF) MR images were acquired within 72 hours of LF-MRI. LF-FLAIR images were co-registered to HF-DWI and the hyperintense DWI region outlined and superimposed on the FLAIR. Regions of interest were mirrored to the contralateral hemisphere to establish a FLAIR signal intensity ratio (SIR).

Results: The FLAIR SIR on images $<$6 hours since LKW was 1.2$\pm$0.32. For cases $<$4 hours (n=3) the SIR was 0.98$\pm$0.08. The SIR for cases $>$6 yet $<$24 hours was 1.34 $\pm$0.33. Cases $>$24 produced a SIR of 1.54 $\pm$0.36. The SIR on LF-MRI at $<$4 hours was significantly less than that observed $>$24 hours (p=0.02).

Conclusions: A 0.064T portable MRI is capable of distinguishing hyperacute stroke from later stroke onset using FLAIR SIR. Future research is needed to determine whether this imaging technology can be used to guide thrombolysis in the setting of wake-up stroke.

Disclosure of interest: Yes

IMAGING – HYPERACUTE

1524

Basal Ganglia Perfusion Parameters Predict Hemorrhagic Transformation after reperfusion therapy of Acute Ischemic Stroke

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Background and aims: Hemorrhagic transformation (HT) is a disastrous complication after acute ischemic stroke (AIS). We aimed to identify parameters from multimodal CT with CT angiography (CTA) and CT perfusion (CTP) most predictive of HT.

Methods: AIS patients from the CHABLIS trial who received thrombolytic therapy with rhTNK- tPA in extended time window were included and categorized according to whether developed HT at follow-up imaging. Infarct extent (measured by ASPECTS and degree of hypoattenuation) was evaluated on NCCT. The CTP source images were registrated to the standard anatomic regions from the ASPECTS system and absolute perfusion parameters were recorded separately from each region of both sides.

Results: Among the 86 patients (age, 68 (59-75) years; 56 [65%] men), 34 patients (39.5%) developed HT. In univariate analysis, the rCBF and rCBV of the lenticula and ASPECTS for the HT group were significantly lower than that for the non-HT group (all P$<$0.05). Patients in HT group had significantly higher rMTT and Tmax of the lenticula compared with those without (P=0.041, P=0.012 respectively). Multivariate analysis revealed ASPECTS (OR=0.56, P=0.03) and rCBF of the lenticula (OR=0.02, P=0.04) as the independent predictors adjusted for age, weight, baseline NIH stroke scale, baseline hypoperfusion, endovascular treatment and door to needle time, with optimal threshold $\leqslant$8 and threshold $<$68% respectively.

Conclusions: For acute anterior ischemic stroke within 24 hours, admission ASPECTS and rCBF of the lenticula showed association with hemorrhagic transformation after reperfusion therapy.

Disclosure of interest: No

IMAGING – HYPERACUTE

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USE OF PERFUSION IMAGING FOR TRIAGE OF PATIENTS WITH ACUTE ISCHEMIC STROKE: SECULAR TRENDS AND EFFECTS ON ENDOVASCULAR TREATMENT AND OUTCOMES

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Background and aims: There is lack of data about perfusion imaging (PI) utilization for acute ischemic stroke (AIS) in real-world practice.

Methods: Using a prospective multicenter stroke registry in South Korea, we identified 49,449 patients with AIS who presented within 24 hours from onset (last-known-well) between 2011 and 2021. We divided study period into 3 epochs, and patients into 2 groups of the early (onset-to-arrival within 6 hours) and late window (6-24 hours). Using PI for triage was operationally defined as acquisition of PI before endovascular treatment (EVT), or within 180 minutes from arrival in those not receiving EVT.

Results: PI utilization decreased in the overall and early window, and increased in the late window; 36.9%, 48.4% and 23.5% in 2011-2014, 30.8%, 36.2% and 24.6% in 2015-2017, and 30.1%, 32.4% and 27.8% in 2018-2021, respectively ($P_{trend's}$ <0.0001). In the early window group with anterior large-vessel occlusion (aLVO) and receiving EVT (n=3,090), PI did not increase the odds of 3-month modified Rankin scale (mRS) 0-2 (adjusted odds ratio, 1.06; 95% confidence interval, 0.90-1.25), but in the late window group with aLVO (n=3,823), PI increased the odds of receiving EVT significantly (2.19; 1.86-2.57). In the overall (early and late window) patients with aLVO (n=10,315), PI did not increase the odds of 3-month mRS 0-2 (1.06; 0.96-1.17), but increased the odds of 3-month mRS 0-1 (1.13; 1.02-1.25) and decreased the odds of symptomatic hemorrhagic transformation (0.77; 0.61-0.97).

Conclusions: This study suggests that implementation of PI is unsatisfactory, albeit effective in triage for EVT.

Disclosure of interest: No

IMAGING – HYPERACUTE

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DELAYED SECONDARY ISCHAEMIC INJURY FOLLOWING ENDOVASCULAR THROMBECTOMY (EVT): RESULTS FROM THE REPERFUSE NA1 STUDY

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Background and aims: Brain damage due to stroke is an important determinant of long-term disability. MRI is sensitive to the acute stroke injury, but the delayed selective neuronal loss cannot be conspicuously detected with MRI. We sought to capture delayed secondary injury by measuring the whole brain volume loss at 90-days.

Methods: REPERFUSE-NA1 is a prospective, multisite MRI sub-study of ESCAPE–NA1 (ClinicalTrialGov #NCT02930018). MRI was acquired immediately after therapy (Day 1, <5 hours post-EVT) and at Day 90. Primary outcome was whole-brain volume loss between Day 1 and 90-days assessed on T1-weighted MRI using FreeSurfer longitudinal automated quantitative measurements.

Results: Total of 42 patients (mean age 65 years, SD=15.1, 52% female, median NIHSS 15 (IQR=9)) were included; 22 received NA1 and 20 received placebo. Median DWI volumes post-EVT (5h) were 8.78 mL (IQR=23.64) in patients randomized to NA1 and 10.58 mL (17.62) in those receiving placebo. At 90-days, FLAIR volume was 6.12 mL (12.27) in NA1 and 6.21 mL (21.80) in placebo, and the Day 90 whole brain volume loss was 15.65 mL (30.21) in patients receiving NA1 and 15.56 mL (27.46) in the placebo group. There was no significant association between NA1 treatment and whole-brain volume loss at Day 90.

Conclusions: This study confirms that whole-brain volume loss is a feasible measurement of delayed secondary ischaemic injury. Treatment with NA1 was not associated with reduced whole-brain volume loss, but the study is limited by small sample size.
Disclosure of interest: Yes

IMAGING – HYPERACUTE

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BLOOD-BRAIN BARRIER LEAKAGE IN STROKE OF UNKNOWN TIME OF ONSET – A POST-HOC ANALYSIS OF DSC-MRI DATA OF THE WAKE-UP TRIAL

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Background and aims: Perfusion magnetic resonance imaging (MRI) studies have demonstrated disruption of the blood-brain barrier (BBB) in acute ischemic stroke of known onset and associations with subsequent intracranial hemorrhage. However, little is known about BBB changes in patients with stroke of unknown onset (e.g., wake-up stroke) and their relationship with outcomes.
Methods: Here, we analyzed dynamic susceptibility contrast-enhanced MRI data of 174 patients of the WAKE-UP Trial (36.8% female, mean age 66.03±11.59, mean baseline NIHSS 7.03±4.76). BBB leakage was estimated as extraction fraction (EF) and z-scored to account for different scanners. Utilizing t-tests and linear models, EF was compared between the lesion (EF_{Lesion}), the penumbra (Tmax>6s, excluding the lesion; $EF_{Penumbra}$), as well as normal tissue (EF_{Norm}), and related to intracranial hemorrhage on follow-up MRI (ICH).
Results: EF was significantly different between the lesion, penumbra and normal tissue (F=115.03(2), P<.001). BBB leakage was highest within the penumbra (0.65±0.71), followed by the lesion (0.08±0.55) and normal tissue (-0.15±0.45) (Ps<.001). $EF_{Penumbra}$ was higher in patients with ICH compared to those without ($P_{unadjusted}$=0.01, $P_{adjusted}$=.05, after adjusting for age, sex and baseline NIHSS). EF_{Lesion} did not differ between ICH and non-ICH patients (P>.05).
Conclusions: Our results indicate the presence of BBB leakage in patients with stroke of unknown time of onset presenting with FLAIR-DWI mismatch. Interestingly, these changes were more prominent in the penumbra compared to the infarct core. Increased EF in patients with ICH suggest that BBB imaging may provide useful information for outcome prediction in wake-up stroke.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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3D TRANSESOPHAGEAL ECHOCARDIOGRAPHY AS A RELIABLE TOOL IN THE DIAGNOSIS OF COMPLICATED ATHEROSCLEROTIC PLAQUES IN THE THORACIC AORTA IN STROKE PATIENTS

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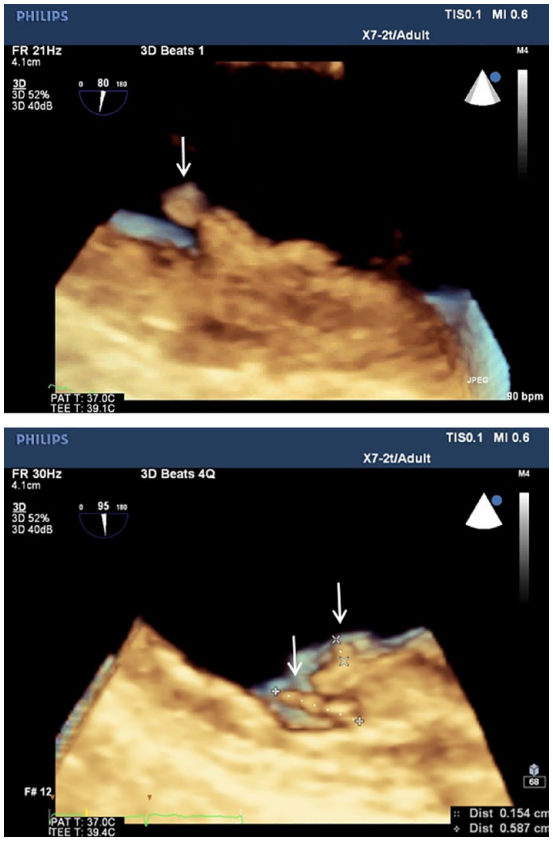
Background and aims: Complicated atherosclerotic plaques (AP) in the thoracic aorta (TA) may be the cause of a stroke, thrombosis and dissection of aortic wall. The use of 3D transesophageal echocardiography (TEE) appears to be a promising non-invasive technique to estimate AP with mobile or ulcerated components in the TA. We aimed to compare 2D and 3D multiplane TEE in the diagnosis of complicated AP in the TA.
Methods: 2D and 3D TEE were performed in 180 consecutive CAD patients using IE33 xMatrix and X7-2t multiplane probe. A history of stroke was revealed in12 (6.6%) patients. The ascending aorta, accessible parts of the arch, and descending aorta were assessed. The height of each plaque was measured. 5 stages of TA atherosclerosis were distinguished.
Results: 620 AP were analysed: 109 in the ascending part, 8 in the arch and 503 in the descending part. AP height in 3D was significantly higher (p<0.001), than in 2D, being 0.38±0.09 cm and 0.26±0.07 cm, respectively. AP height increase in 3D was 0.12±0.06 cm. In 3D 88% of AP have shown crypts and caverns while in 2D only 35% of AP had rough



contours. The mobile component in 6 (66.6%) out of 9 AP was revealed only in 3D: 2 – ascending aorta, 1 – arch, 3 – descending aorta (Figures). With 3D TEE 72% of patients were found to have higher gradation of TA atherosclerosis stage.
Conclusions: 3D TEE is a more precise method for assessing complicated AP in the TA and diagnosis of TA atherosclerosis stage.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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EVOLUTION OF LEPTOMENINGEAL COLLATERALS IN MIDDLE CEREBRAL ARTERY STENOSIS POSSIBLY DRIVEN BY THE TRANSLESIONAL PRESSURE GRADIENT

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Background and aims: The mechanisms and evolution patterns of leptomeningeal collaterals (LMCs) in symptomatic intracranial atherosclerotic stenosis (sICAS) remain elusive. We aimed to investigate the evolution patterns of LMCs over 1 year in medically treated sICAS patients, and the association with translesional pressure gradient (PG) of sICAS assessed by CT angiography (CTA)-based computational fluid dynamics (CFD) models.
Methods: In a longitudinal, observational study, patients with symptomatic, atherosclerotic stenosis (50-99%) of M1 middle cerebral artery (MCA), who had CTA at baseline and 1 year, were recruited. Good or poor LMCs, assessed by the laterality of distal vessels in anterior and posterior cerebral artery territories in CTA, was recorded at baseline and 1 year. LMCs at 1 year was defined as being worse, similar or better versus baseline. CFD models based on baseline and 1-year CTA were constructed to simulate blood flow across the culprit MCA lesion in each patient, and the translesional PGs (difference between pre- and post-stenotic pressures) were quantified and compared between baseline and 1 year.
Results: Among 32 patients (median age 62 years; 65.6% males), 12 (37.5%), 15 (46.9%) and 5 (15.6%) patients had worse, similar and better LMCs at 1 year versus baseline, respectively. Larger translesional PG at 1 year versus baseline was associated with good 1-year LMCs (adjusted odds ratio 6.78, 95% confidence interval 1.19-38.74; p=0.032), independent of the baseline LMC status.
Conclusions: LMCs may evolve over time in medically treated sICAS patients, which may be partially driven by increased PG across the sICAS lesion.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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ARTERIAL SPIN LABELLING (ASL) REPERFUSION INDEX IS ASSOCIATED WITH INFARCT GROWTH AND EARLY NEUROLOGICAL IMPROVEMENT AMONG PATIENTS WITH FAVOURABLE ANGIOGRAPHIC RECANALISATION

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Background and aims: Reperfusion of the microcirculation at capillary level may not occur despite complete angiographic recanalisation. We investigated whether reperfusion quality modified outcomes in patients with recanalised large vessel occlusion (LVO) 48 – 72h after stroke onset.
Methods: Patients <24h from stroke onset were included in a prospective, single centre observational study. Hypoperfusion volume (Tmax>6s) on baseline computed tomography perfusion (CTP) imaging was calculated by RAPID. Follow-up 3T MRI 48-72h from admission included ASL. Only patients with initial LVO and follow-up angiographic arterial occlusion lesion (AOL) score of II or III (recanalisation) were included. Reperfusion index (RI) was the difference between Tmax>6s and ASL hypoperfusion volume (rCBF<20%). Follow-up radiological and neurological outcomes were compared between RI was dichotomised into moderate (RI: 0.41 – 0.70) and high (RI: 0.71 – 1.0) groups.
Results: We included 48 patients, mean age 67 ± 12 years, and median baseline NIHSS 8 (IQR: 5 – 11). ASL was acquired at mean 60 ± 23h after symptom onset. Median follow-up NIHSS was 2 (IQR: 1-6). Mean RI was 0.6 ± 0.2. Patients with high RI had significantly smaller infarct volume growth ($p = 0.048$) and improved NIHSS compared to the group with moderate RI ($p = 0.014$) (Figure 1 and 2).
Conclusions: Different qualities of microcirculatory reperfusion were associated with infarct growth and neurological improvement even among those with good angiographic recanalisation of LVO.

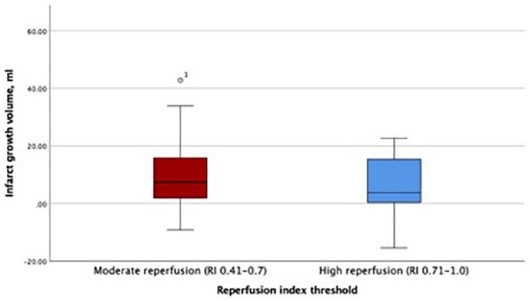

Figure 1: Box plot of infarct growth volume and reperfusion index threshold. Subjects who had moderate reperfusion had significant larger infarct growth (median 6.7ml; IQR: 1.85 -15.7) than subjects who had high reperfusion (median 3.5ml; IQR: 0.1 – 15.45) (p = 0.048).

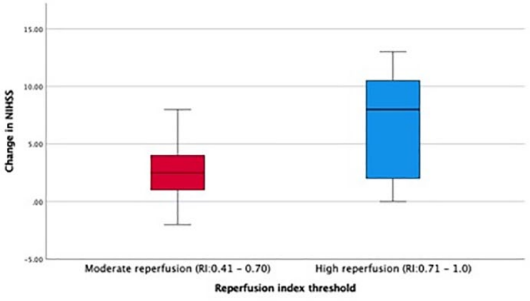

Figure 2: Box plot of infarct change in NIHSS and reperfusion index threshold. Subjects who had moderate reperfusion had significant smaller change in NIHSS (median 3; IQR: 1 – 4) than subjects who had high reperfusion (median 8; IQR: 2 - 11) (p = 0.014)

Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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Vertebral Artery Foraminal Segment Doppler Sonography for the Detection of Vertebral and Basilar Artery Stenosis

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Background and aims: The diagnostic value of vertebral artery foraminal segment (V2) sonography remains understudied. This study aims to estimate the predictive value of V2 Doppler for the detection of vertebrobasilar steno-occlusion on the magnetic resonance angiography (MRA).
Methods: Three hundred sixty-four vertebral arteries were investigated. Abnormal Doppler spectra were categorized into high resistance flow (resistive index >0.9), low resistance flow (resistive index <0.5), increased flow velocity (peak systolic velocity ⩾ 137.5 cm/s), or no flow signal. On the MRA, stenosis and occlusion were defined as > 50 % narrowing and absent flow signal, respectively. Sensitivity, specificity, positive predictive value (PPV), and negative predictive value (NPV) were calculated.
Results: Sixty of 364 vertebral arteries (16.5%) had V2 Doppler abnormalities (high resistance flow 11.3%, no flow signal 3.8%, low resistance flow 1.4%) while 89 vertebrobasilar arteries (24.5%) had a steno-occlusion. The Doppler abnormality predicted a vertebrobasilar stenosis with a sensitivity of 56.2% and a specificity of 96.4% (PPV 83.3%, NPV 87.2%). The sensitivity and specificity changed to 90.0% and 90.1% respectively with regard to the vertebrobasilar occlusion (PPV45.0%, NPV 99.0%). Hypoplastic vertebral artery (HVA, lumen dimeter ⩽ 2.7mm) more frequently presented abnormal V2 Doppler spectra (mostly, high resistance flow) even when it was non-stenotic than normal-diameter vertebral artery ($p<0.001$). In addition, HVA was associated with vertebrobasilar stenosis ($p<0.001$).
Conclusions: Our data shows that the V2 sonography has a moderate predictive value for the detection of vertebrobasilar stenosis, and HVA is associated with abnormal Doppler as well as vertebrobasilar stenosis.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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Infarct volume mediates majority of the effect of recanalisation on outcome

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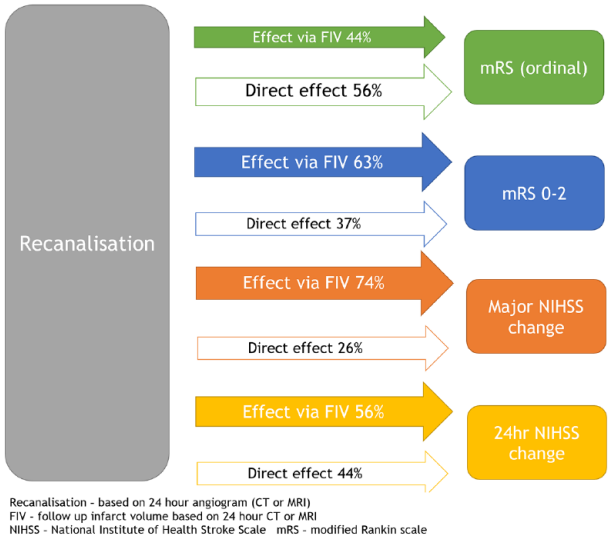
Background and aims: Early recanalisation improves outcome after acute ischaemic stroke (AIS). The extent that outcome is mediated by follow-up infarct volume (FIV) varies in literature. We explored the mediating effect of FIV on the relationship between recanalisation and outcome in patients with AIS receiving intravenous thrombolysis (IVT).
Methods: We selected M1 occlusion participants from two trials of IVT in AIS. FIV and recanalisation were assessed on 24-hour CT/MRI/CTA. Mediation analysis was performed using PROCESS on SPSS. The predictor variable was recanalisation, the mediating variable was FIV, and outcome variables were day 90 modified Rankin scale (mRS) and National Institute of Health Stroke Scale (NIHSS) change at 24 hours (numerically or 'major change' defined as decrease by 8 or to 0-1).
Results: In 75 cases meeting selection criteria, median NIHSS was 15 (13-18), 56 achieved recanalisation, median FIV was 32ml (16.1-75.7) and 38 cases had mRS 0-2 at day 90.
Recanalisation was a significant predictor of all outcome variables tested. Addition of FIV as a mediating variable resulted in recanalisation becoming non-significant for all variables except likelihood of mRS 0-2.
FIV was a significant mediator between recanalisation and all 4 outcomes. FIV accounts for 63%, 44%, 74% and 56% of the effect of recanalisation on likelihood of mRS 0-2, mRS change, major NIHSS change, and 24hr NIHSS respectively.
Conclusions: FIV is a significant mediator of the relationships between recanalisation and functional outcome or early neurological recovery. The degree of mediation was significantly higher in our study than previous literature.



Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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Multi-omics and 3D-imaging reveal bone heterogeneity and unique calvaria cells in neuroinflammation

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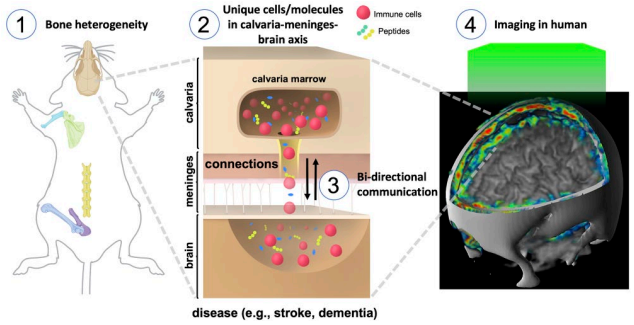
Background and aims: The meninges of the brain are an important component of neuroinflammatory response. Diverse immune cells move from the calvaria marrow into the dura mater via recently discovered skull-meninges connections (SMCs). However, how the calvaria bone

marrow is different from the other bones and whether and how it contributes to human diseases remain unknown.
Methods: We used single-cell RNA sequencing, mass spectrometry-based proteomics, tissue clearing of mouse and human tissues as well as TSPO-positron-emission tomography imaging data of patients with various neurological disorders (stroke, Alzheimer's disease, Multiple sclerosis, 4-repeat Tauopathy) to decipher molecular profile of the skull bone marrow in addition examining its involvement in human diseases.
Results: The calvaria harbors the most distinct molecular signature with hundreds of differentially expressed genes and proteins. Stroke induces skull-specific alterations including increased calvaria cell numbers in mice. Moreover, TSPO-positron-emission tomography imaging of stroke, multiple sclerosis and neurodegenerative disease patients demonstrate disease-associated uptake patterns in the human skull, mirroring the underlying brain inflammation.
Conclusions: Our study indicates that the calvaria is more than a physical barrier, and its immune cells may present new ways to control brain pathologies.



Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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CEREBRAL HEMODYNAMICS BY COMPUTATIONAL FLUID DYNAMICS MODELING IN SYMPTOMATIC INTRACRANIAL ATHEROSCLEROTIC DISEASE AND THE CLINICAL RELEVANCE: A SYSTEMATIC REVIEW

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Background and aims: Computational fluid dynamics (CFD) has been introduced to investigations of hemodynamics and the clinical relevance in symptomatic intracranial atherosclerotic disease (sICAD) in recent years. We aimed to systematically review the characteristics and findings of CFD studies in sICAD.
Methods: Following the PRISMA and MOOSE statements, we searched PubMed and Embase up to December 2022, and screened for articles reporting the associations of hemodynamic parameters derived from CFD models with imaging markers and/or clinical outcomes in sICAD. Technical papers or case reports with no clinical association studies were excluded.
Results: Among eighteen articles included, most studies were conducted in Asia. Eight and one studies respectively focused on anterior- and posterior-circulation lesions, and nine articles involved both circulations. In most studies, CT angiography was used as the source image, for CFD modeling with generic boundary conditions, rigid vessel wall and Newtonian fluid assumptions, in sICAD of 50-99% stenosis. Translesional changes in pressure and wall shear stress (WSS) were promising indicators for stroke recurrence in sICAD. Focal WSS measures were associated with plaque rupture and lesion evolution. Some of these hemodynamic metrics were also associated with the collateral status, cerebral perfusion, platelet function, and in-stent restenosis. Other hemodynamic parameters studied inlcuded flow velocity, vorticity and helicity.
Conclusions: CFD modeling has been increasingly used in investigating hemodynamics in sICAD, which has important clinical implications. However, no widely-accepted modeling methodology has been established. Rigorous validations are required, to extend the application into clinical practice
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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ARTERIAL SPIN LABELLING (ASL) REPERFUSION INDEX PREDICTS EARLY NEUROLOGICAL RECOVERY AND GOOD FUNCTIONAL OUTCOME IN ACUTE ISCHAEMIC STROKE PATIENTS

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Background and aims: ASL allows quantification of cerebral blood flow (CBF) without contrast administration. We investigated reperfusion index using ASL-measured CBF in patients 48–72 hours after stroke onset.
Methods: Patients presenting <24h from stroke onset were included in a prospective, single centre observational study. Hypoperfusion volume (Tmax>6s) on baseline computed tomography perfusion (CTP) imaging was calculated using RAPID software. Follow-up 3T MRI undertaken at 48-72h from admission included ASL. Reperfusion index was the difference between Tmax>6s and ASL hypoperfusion volume (CBF20%). Relationships between ASL reperfusion index, radiological outcomes, and follow-up National Institutes of Health Stroke Scale (NIHSS) were assessed using Spearman's correlation. Regression analyses were performed to determine independent predictors of radiological outcomes, early neurological recovery, and 90-day good functional outcome.
Results: We analysed data from 63 patients, mean age 67 ± 13 years and median baseline NIHSS 7 (IQR: 4 – 11). ASL was acquired at mean 59 ± 23 hours after symptom onset. Median follow-up NIHSS was 3 (IQR: 1-8). Mean reperfusion index was 0.5 ± 0.2. Reperfusion index was significantly negative correlated with infarct growth ($r = -0.421$, $p < 0.001$) and positively correlated with penumbra salvage ($r = 0.297$, $p = 0.021$). Regression analyses showed reperfusion index was a significant independent predictor for early neurological improvement (OR 1.370, 95% CI 0.572 to 16.721; $p < 0.036$) and 90-day good functional outcome (OR 49.817, 95% CI 3.097 – 801.435, $p = 0.006$).
Conclusions: ASL reperfusion index correlated with radiological outcomes, early neurological improvement, and day 90 functional outcomes.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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Doppler ultrasound in the diagnostics of the disease of small cerebral vessels

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Background and aims: Disease of the small cerebral vessels (DSV) of the brain causes 25% of strokes and contributes to 45% of dementia cases. The prevalence of the disease increases with age, affecting approximately 5% of people in their 50s to nearly 100% of people over 90.
The purpose of the study was to evaluate the diagnostic value of Doppler ultrasound examination in the disease of small cerebral vessels
Methods: The study was conducted in 2020-2021. 38 patients aged 65-78 years with SVD verified by means of neuroimaging (MRI 1.5 T) were examined. In addition, a Doppler study of cerebral vessels was performed using a Toshiba Aplio 500 device (Japan). As a control, 30 people of the same age without signs of SVD were examined. Statistical processing was carried out by methods of dispersion and correlation analysis using Statistica 14.0 software (TIBCO, USA).
Results: All patients with SVD showed an increase in Gosling's index up to 1.15 ± 0.03, and the value of the index was correlated with the Fazekas score ($r=0.68$) and age ($r=0.71$). In the control group, the index values averaged 0.79 ± 0.03 ($p<0.001$). Thus, for patients with normal values of the index, the probability of manifested disease of small vessels is low.
When assessing the diagnostic value of the method, it was determined that its sensitivity is 0.96, and specificity is 0.85 (J=0.81).
Conclusions: Doppler imaging of brain vessels has a high diagnostic value for detecting small vessel disease and can be used to select candidates for MRI neuroimaging.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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Sensitivity and agreement rate of Doppler Ultrasound compared to CT angiography for Carotid Web diagnosis: systematic review

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Background and aims: Carotid webs (CaW) are shelf-like non-atherosclerotic lesions of the internal carotid arteries. CaW prevalence is as high as 37% in patients with cryptogenic ischemic stroke and it is frequently reported as a cause of recurrent stroke. Prompt recognition and treatment of CaW is therefore important. Several studies suggest that DSA and CTA might be better to diagnose CaW than Doppler ultrasound (DUS), but the best diagnostic method remains to be defined.
Methods: Systematic literature review of articles reporting patients submitted to both CTA and DUS with CaW diagnosed by at least one of these methods. PUBMED and EMBASE were searched from inception to 31/08/2022. Patients' characteristics and CTA and DUS results were analyzed as well as the main categories of incorrect diagnosis by DUS. Sensitivity and agreement rate of DUS vs CTA were calculated.
Results: We included 27 articles (121 patients). DUS identified 94 patients with CaW and CTA identified 116 patients with CaW. CaW was detected by DUS but not by CTA in 4.13% (5 patients). Sensitivity of DUS compared to CTA was 76.7% (95%CI 68.0-84.1%) and agreement rate was 73.6% (95%CI 64.8-81.2%). DUS misdiagnoses were most commonly reported as normal exam (44.4%), atherosclerosis (22.2%) and carotid dissection (7.4%).
Conclusions: Sensitivity and agreement rate of DUS compared to CTA were moderate. DUS remains useful as an ancillary test for AIS, and it can diagnose some CaW not recognized by CTA. Greater awareness of CaW and additional ultrasound protocols might enhance CaW diagnosis through DUS.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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Vertebrobasilar recording of right-to-left shunt: a prospective study in patients with cryptogenic stroke

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Background and aims: Right-to-left shunt (RLS) represents an important cause of cryptogenic stroke (CS). Transcranial Doppler (TCD) with an agitated saline bubble study is a highly sensitive modality for RLS diagnosis with a transtemporal approach (TCD-TT). However, a minority of patients has insufficient temporal windows. Our aim was to evaluate the accuracy of transoccipital TCD (TCD-TO) for RLS diagnosis.
Methods: Prospective, single-centre, observational study including patients with CS or transient ischemic attack (TIA) who were included in a standard protocol for RLS diagnosis between January 2022 and January 2023. We compared TCD-TT and TCD-TO approaches. We also evaluated the concordance of RLS grade between TCD-TO and transesophageal echocardiogram (TEE) through kappa index.
Results: Eighteen patients were included (66.7% men, median age: 49 years old, IQR: 43-53,75). The most frequent diagnosis was hemispheric stroke (55.6%). RLS was found in ten patients (55.6%) after the Valsalva maneuver with TCD-TT, and nine with TCD-TO (50%). Sensitivity and specifity of TCD-TO reached 90% and 100% respectively, whereas positive predictive value was 89% and negative predictive value was 79%. Moreover, the concordance of RLS grade between TCD-TT and TCD-TO was 0.76 ($p<0.001$).
All nine positive-RLS screened by TCD-TO were confirmed by TEE, with medium or large RLS. Only one patient with negative screening for RLS underwent TEE, where a small RLS was shown. The concordance between TCD-TO and TEE was 0.688 ($p<0.004$).
Conclusions: TCD-TO is a sensitive and specific test for RLS diagnosis, with a substantial concordance with TEE, especially for medium and large RLS.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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ASSOCIATIONS OF RETINAL MICROVASCULATURE AND BRAIN PHENOTYPES IN PATIENTS WITH SLEEP APNOEA SYNDROME

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Background and aims: Individuals suffering from obstructive sleep apnoea (OSA) are at higher risk of developing small vessel disease (SVD), a major cause of stroke worldwide. Here, we investigate associations between retinal vascular phenotypes and SVD features such as white matter hyperintensities (WMH) and perivascular spaces (PVS), and brain microvascular reactivity.
Methods: Retinal Optical Coherence Tomography (OCT) and OCT-Angiography images were obtained from 40 patients clinically diagnosed with moderate/severe OSA pre-treatment. WMH, Fazekas score, brain atrophy scores, and PVS (basal ganglia (BG), centrum semiovale (CSO)) and cerebrovascular reactivity to 6%CO2 were assessed using brain MRI. Retinal phenotypes (vessel density in parafoveal and foveal regions, vessel radius and tortuosity of large vessels and capillaries, branching points, foveal avascular zone area, and retinal nerve fiber layer RNFL thickness) were calculated by using a previously published framework for OCTA analysis consisting in image binarization, skeletonization, and modeling of the vasculature as a network. Associations were investigated using a generalized estimating equation model adjusted for sex, age, systolic BP, diabetes status, BMI, and image quality index.
Results: We found associations between: large vessel radius and PVS count in the BG (standardized β=0.06, p=0.04); large vessel tortuosity and multiple PVS phenotypes in the CSO (e.g., average width, β=0.13, p=0.04); parafoveal and foveal vessel density and most of PVS variables ($p<0.05$); and RNFL thickness and deep brain atrophy (β=-0.20, $p<0.01$). Cerebrovascular reactivity was associated (β=0.21, p=0.05) with capillary radius.
Conclusions: These results provide further evidence that SVD features and vascular dysfunction reflect underlying microvascular morphological change.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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Clinical and Brain frailty in Independent Patients Undergoing Mechanical Thrombectomy

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Background and aims: Baseline imaging markers of 'brain frailty' are independently associated with worse clinical outcomes after acute stroke. Little is known about baseline clinical and 'brain frailty' in patients undergoing thrombectomy.
Methods: Consecutive patients who underwent thrombectomy at University Hospitals Birmingham NHS Foundation Trust, UK from November 2020 to December 2021 were included. Modified Rankin Scale (mRS) was recorded pre-thrombectomy. Clinical frailty was measured retrospectively using the Clinical Frailty Score (CFS) from 1 'very fit' to 9 'terminally ill'. Markers of 'brain frailty' (leukoaraiosis, cerebral atrophy and old vascular lesion) were measured on baseline CT brain imaging blinded to clinical information (maximum score 3). Data are n (%), mean (standard deviation), median [interquartile range], Spearman's correlation co-efficient with 2-sided p-values.
Results: 100 patients were included; mean age 64 (16.3) years, 41% female, 84% baseline mRS 0, 12% mRS 1, 3% mRS 2, 1% mRS 3. Median CFS 3 [1, 4] and 'brain frailty' score 1 [0, 2]. In those with mRS 0, CFS ranged 1-5 ('very fit' to 'mild frailty') and 'brain frailty' score 0-3. 'Brain frailty' score was weakly positively correlated with baseline mRS (r=0.315, p=0.001). Correlations between mRS and CFS, and 'brain frailty' and CFS were non-significant.
Conclusions: In patients undergoing thrombectomy who are independent at baseline according to mRS, there is wide variation in CFS and 'brain frailty' scores. Further research is needed to establish whether prospective recording of clinical and 'brain frailty' is useful in decision-making for clinicians prior to thrombectomy.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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Geometry at terminal internal carotid artery bifurcation associated with middle cerebral artery plaque ulceration: a three-dimensional rotational angiography study

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Background and aims: The geometric features at terminal internal carotid artery (ICA) bifurcation may affect initiation and development of atherosclerosis in middle cerebral artery (MCA). We aimed to investigate the association between ICA bifurcation geometry and MCA plaque ulceration.
Methods: In a prospective, cross-sectional study, patients with symptomatic, high-grade (60-99%), atherosclerotic MCA-M1 stenosis confirmed in three-dimensional rotational angiography (3DRA) were recruited. We classified the MCA-M1 plaques as smooth, irregular and ulcerative by the surface contour, and assessed the geometric features at terminal ICA bifurcation in 3DRA. We compared patients' characteristics and ICA bifurcation geometry between those with different plaque types in all patients, and in those with proximal MCA-M1 plaque (within 10mm of the ICA bifurcation) as sensitivity analysis.
Results: Among 164 patients (median age 60 years; 64.6% males) with symptomatic MCA-M1 stenosis, 53 (32.3%), 89 (54.3%) and 22 (13.4%) respectively had smooth, irregular and ulcerative plaques, with a median stenosis of 77%. Patients' characteristics were similar between those with different plaque types. Yet, there were smaller MCA/anterior cerebral artery (ACA) area ratio (medians 1.39 versus 1.72; p=0.007), MCA/ICA area ratio (0.55 versus 0.68; p=0.065), and a smaller MCA-ACA angle (101.4 versus 112.4 °; p=0.032) in those with an ulcerative MCA plaque than otherwise. There were similar findings in the 137 patients with proximal MCA-M1 plaque ($p<0.05$ for these three geometric metrics).

Conclusions: Geometry at the terminal ICA bifurcation may play a role in MCA plaque ulceration. Rheological studies may reveal the possible hemodynamic mechanisms.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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DIAGNOSTIC ACCURACY OF MR CAROTID PLAQUE IMAGING COMPARED TO HISTOPATHOLOGY IN SYMPTOMATIC CAROTID ARTERY STENOSIS

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Background and aims: The MR carotid plaque imaging using 3T MRI can identify the high-risk plaques and help in deciding on need of carotid intervention and may predict periprocedural ischemic events. We evaluated the diagnostic accuracy of MR carotid plaque imaging in identifying the plaque vulnerability and compared with histopathological findings in patients with symptomatic carotid stenosis.
Methods: Forty five consecutive patients with moderate to severe stenosis who underwent carotid endarterectomy (CEA) and had 3T MRI plaque imaging with multi-sequence protocol (T1, T2, Time of flight, Diffusion, Proton density weighted and T1-postcontrast) were analyzed. Images were reviewed by neuroradiologist who is blinded to histopathological data. The high-risk plaque characteristics such as lipid rich necrotic core (LRNC), intraplaque hemorrhage (IPH), thin fibrous cap and ulceration were assessed and compared with histopathological findings as per American heart association (AHA) classification.
Results: The mean age was 65±7.7 years (males 84.4%) and the mean duration of CEA from recent event was 57 days (57± 4 days). A significant congruence between MR Plaque imaging and histopathology was noted for IPH (sensitivity- 91%, specificity- 86%, k=0.77, p=<0.001), LRNC (sensitivity- 91%, specificity- 90%, k=0.67, p=<0.001), and ulceration (sensitivity- 90%, specificity- 74%, k=0.56, p=<0.001). The overall sensitivity and specificity in discriminating high risk plaque characteristics with MRimaging was 92.3% and 84.2% respectively (k- 0.57, p-<0.001).
Conclusions: The MR plaque imaging is capable of identifying the unstable plaque characteristics with high accuracy. This may have implication in selection for carotid revascularization in patients with asymptomatic carotid stenosis.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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THE TYPE OF ARTERIAL HIPPOCAMPAL SUPPLY, ASSESSED AT 7T MRI, IS NOT A RISK-FACTOR FOR TRANSIENT GLOBAL AMNESIA

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Background and aims: Transient global amnesia(TGA) is characterized by sudden and short-lasting amnesia. The hippocampus is involved in its pathophysiology, which manifests through the presence of hippocampal diffusion-weighted-imaging (DWI) signal restriction. Diminished perfusion and ischemic lesions have been proposed as possible underlying pathophysiological mechanisms, but the etiology of TGA remains unclear. A recent 7 Tesla(T) MRI study showed that arterial hippocampal supply originating from both the anterior choroidal artery(AchA) and the posterior cerebral artery(PCA) (double-supply) correlates with higher vascular reserve and cognition. We investigated whether a single-hippocampal-supply(PCA only) represents a risk-factor for TGA.
Methods: A 7T time-of-flight(ToF) angiography(0.28-0.4 mm, isotropic resolution) and T1-weighted and DWI MRI were performed in 23 TGA patients(mean[SD] age: 62.0[7.2] years, 30%F) recruited through the University Clinic of Bonn and in 27 healthy elderly controls(71.1[8.1] years, 52%F) from the DZNE Magdeburg. A hippocampal mask was created using FreeSurfer and adopted as an anatomical landmark to analyze 7T-ToF data. The hippocampal vascularization of each hemisphere was classified using MeVisLab and logistic regression was performed, setting TGA-diagnosis as dependent variable and presence of one single-hippocampal-supply, age, and sex as predictors. Furthermore, hippocampal DWI lesions were assessed.
Results: 52% healthy controls and 51% TGA patients showed a single-hippocampal-supply in at least one hemisphere, which had no significant effect in the logistic regression analysis. 11 hemispheres displayed a DWI-hippocampal-lesion(7/22 TGA patients; 4 bilateral lesions). Only 4/11(34%) of these hemispheres corresponded to a single-hippocampal-supply.
Conclusions: These results suggest that arterial hippocampal supply is not a significant risk-factor for TGA.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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IMPACT OF THE IMPLEMENTATION OF FOCUSED CARDIAC ULTRASOUND IN A STROKE UNIT

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Background and aims: Focused cardiac ultrasound (FCU) is a screening test for embolic heart diseases that can be performed by neurologists to reduce in-hospital stays. In the second quarter of 2020, FCU was introduced in our Neurosonology Laboratory. It is routinely performed depending on the availability of the accredited neurosonologist. Our objective is to analyze the impact of this FCU in the reduction of the length of hospital stay (LOS).
Methods: Observational retrospective study including stroke patients, admitted in our center for two years period (2020-2021), who needed an

ultrasonographic cardiac study for the aetiological diagnosis of stroke. Variables: demographic data, vascular risk factors, stroke subtype, diagnosis tests, LOS, transthoracic echocardiography findings (TTE) and FCU findings. Two groups were compared: patients with FCU (FCU-group) and without FCU (no-FCU-group).
Results: Out of 808 patients with cerebral infarction, 318 were selected with FCU and/or TTE during admission, 207 in FCU-group and 111 in no-FCU-group. 60.4% were males, mean age was 68.44 (SD 13.3) years and 46.4% had an NIHSS>=5 on admission. Median (IQR) LOS was 7 (4) days in FCU-group vs. 8 (5) in no-FCU group (*P*=0.002).
Conclusions: The implementation of FCU in a Stroke Unit reduces the LOS.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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THE USE OF ELECTROPHYSIOLOGY IN POSTERIOR CIRCULATION STROKES

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Background and aims: Electrophysiological methods can be used as additional testing to imaging for verification of small ischemic lesion in vertebrobasilar area. Main goal of our study is to compare motor evoked potentials (MEP) and blink reflex (BR) abnormities with magnetic resonance imaging (MR) in posterior circulation stroke patients.
Methods: Our group includes 38 patients aged 30-88 (median 67 years) - 75.4% of men and 24.6% of women - with a clinically diagnosed posterior circulation stroke (normal acute CTA findings, DWI MR posterior circulation stroke verification). Within 7 days of the start of the event, electrophysiological testing of MEP (upper limbs) and blink reflex (BR) were performed. Following variables were statistically correlated: MR localization, MR side BR normal/abnormal, MEP side, MEP normal/abnormal. All patients without DWI MR acute ischemic lesion were excluded from the study.
Results: Variable MR localization of ischemia can be distinguished by BR, especially in medulla oblongata localization ($p = 0.00563$), but variable MR side is independent to BR. Variable MR localization of ischemia can be distinguished by MEPs, especially in pontomesencephalic and cerebellar regions ($p = 0.0442$).
Conclusions: Motor evoked potentials and blink reflex can be used as additional testing in the brainstem strokes diagnosis. The advantage is the simplicity of the examination especially in case of unavailability of magnetic resonance examination.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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EVALUATION OF THE NATURE OF HYPERDENSITY ON CRANIAL CT AFTER THROMBECTOMY (II). USEFULNESS OF TRANSCRANIAL ULTRASOUND

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Background and aims: The presence of hyperdense lesions in 24-hour control CT after mechanical thrombectomy (MT) have been attributed to cerebral hemorrhage (CH) or contrast extravasation (CE) without clear criteria to differentiate between them. Transcranial ultrasound (TU) has a high reliability to detect cerebral hemorrhages. In the second part of the study we aim to assess if TU performed in the first 24 hours allows to differentiate between CH and CE.
Methods: Prospective unicentric study of diagnostic test validation with blind reviewers. Developed from 2018 to 2022 in a stroke center. Patients suffering from acute ischemic stroke, treated with MT with presence in control CT of hyperdense lesions in the MCA area suitable for TU study (basal ganglia). TU was compared with cranial MRI (SWI and T2*-GRE sequences included) or a second CT within 72 hours.
Results: 36 patients (7,2%) of the 497 treated with MT presented CT hyperdense lesions. TU was performed in 34 (94,4%) and 31 (86,1%) presented an optimal acoustic window. The presence of underlying CH was demonstrated by MRI or second CT in all cases. TU showed hyperechogenic lesions in 30 (96'7%) patients (sensitivity for TU 96,7%, PPV 100%; specificity and PNV not valuable). Correlations of major and minor diameters of lesion between basal CT and TU were R 0,80 and 0,74. Correlations between MRi (SW) and TU were R 0,77 and 0,92.
Conclusions: Transcranial ultrasound showed high reliability to detect and delimit the hyperdense lesion in basal CT which correspond to hemorrhagic transformation.
Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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Robot-assisted transcranial Doppler versus transthoracic echocardiography for right to left shunt detection: "Real World" First-Look

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Background and aims: A device trial of robot-assisted TCD (raTCD) vs transthoracic echocardiography (TTE) for right to left shunt (RLS) detection (BUBL, NCT04604015) was completed, in which raTCD detected all and large RLS at approximately 3 times the rate of TTE. It is unknown if these results are generalizable to routine practice.
Methods: We conducted a multi-site retrospective review of prospectively collected "real world" clinical data of raTCD for RLS diagnosis. All patients who underwent raTCD were included. These results were compared to the results of BUBL with descriptive statistics and 2-sample proportion tests.
Results: There were 350 patients who underwent clinical raTCD across three participating sites. The mean age was 56 $\pm$ 13 years compared to 59 $\pm$ 14 years in BUBL ($p = 0.03$, 95% CI 0.20-5.49). Both cohorts were 46% female. The clinical population had any RLS on raTCD in 54% (189/350) compared to 64% in BUBL (p= 0.14, 95% CI -0.02-0.18). Large RLS was detected in 26% (91/350) of the clinical population as compared to 27% in BUBL ($p = 0.89$, 95% CI -0.08-0.11). The "no window" rate in

the clinical population was 5% (18/350), compared to 7% in BUBL (p = 0.39, 95% CI -0.03-0.08).
Conclusions: The same raTCD device that was safe and 3 times more likely to diagnose RLS than TTE in the BUBL trial detected all and large RLS in clinical practice at a rate similar to that demonstrated in BUBL.
Disclosure of interest: Yes

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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Intracranial Artery Calcification is Associated with Cerebral Atrophy in Ischemic Cerebrovascular Disease – Erasmus Stroke Study

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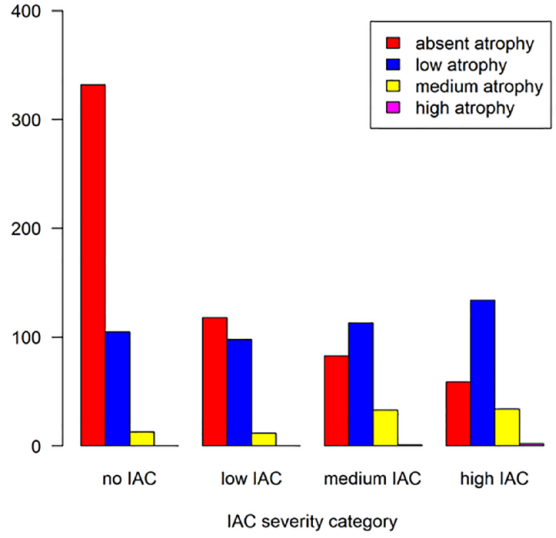
Background and aims: Imaging performed during acute stroke workup often provides a trove of information on overall cerebral health. Aspects such as intracranial artery calcification (IAC) and cerebral atrophy (CA), both considered important factors in post-stroke cognitive decline, are easily identifiable on these images. However, their coexistence at the time of stroke has not been quantified previously.
Methods: Between December 2005 and October 2010, 1137 patients (mean age 62.7 (SD ±14.0) years, 46.9% female, 61.2% ischemic stroke and 38.8% TIA) were recruited. Non-contrast CT and CT-angiography were conducted as part of the routine stroke workup. CTA images were assessed for presence and volume (in mm³) of arterial calcifications in the intracranial carotid and vertebrobasilar arteries, whereas non-contrast images were assessed for presence and severity of CA. We investigated the association of IAC with presence and severity of CA using binominal and ordinal logistic regression models, adjusting for age, sex, ethnicity and cardiovascular risk factors.
Results: CA was prevalent in 546 (48.0%) patients. Furthermore, CA was prevalent in 428 (62.3%) of 687 (60.4%) patients with IAC. After full adjustment, prevalent IAC remained associated with prevalent CA (adjusted Odds Ratio: 1.60 (95% CI [1.15-2.23])) and CA severity (adjusted cumulative Odds Ratio (acOR): 1.56, [1.15-2.16]). Larger IAC volumes were independently associated with CA severity (acOR 1.34 [1.16-1.56]).
Conclusions: CA was prevalent in almost half of all admitted patients and in almost two-third of patients with IAC. A larger IAC burden was independently associated with a higher severity of CA.

Table 1 – Results of ordinal logistic regression analyses on more severe CA.

Prevalent IAC	acOR	95% CI
Model 1	1.82	1.35-2.44
Model 2	1.72	1.27-2.34
Model 3	1.56	1.15-2.16
Per SD increase in IAC log-transformed volume	**acOR**	**95% CI**
Model 1	1.45	1.26-1.66
Model 2	1.41	1.22-1.63
Model 3	1.34	1.16-1.56
In tertiles of IAC volume, no IAC as reference	**acOR**	**95% CI**
Mild		
Model 1	1.28	0.89-1.83
Model 2	1.26	0.87-1.82
Model 3	1.19	0.82-1.72
Moderate		
Model 1	2.09	1.45-3.01
Model 2	2.03	1.39-2.96
Model 3	1.88	1.29-2.76
Severe		
Model 1	2.48	1.70-3.61
Model 2	2.28	1.54-3.39
Model 3	2.02	1.35-3.02

Model 1: adjusted for age, sex and white ethnicity. Model 2: adjusted for model 1 + comorbid hypertension, diabetes mellitus, hypercholesterolemia, kidney function impairment, history of smoking. Model 3: adjusted for model 2 + scanner type (16-, 64-, 128-slice CT system), maximum degree of internal cartid artery stenosis and presence of vertebral artery hypoplasia

Figure 1 – Histogram distribution of Cerebral Atrophy by IAC severity category.



Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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Rim sign on CTA as marker for IPH on MRI: making stroke prediction easier

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Background and aims: IPH has become an important risk indicator for stroke recurrence in patients with carotid stenosis. Although IPH can easily be assessed using standard-MRI, carotid MRI in the (sub)acute clinical phase is cumbersome. Since CTA is widely implemented, investigation of which CTA markers could be indicators of IPH is relevant because it can simplify identification of patients at high-risk for recurrent stroke. Yet, there are no well-performing markers.
Methods: This study is based on the Plaque-At-RISK-study including patients with recent symptomatic <70% carotid stenosis from whom blood and carotid CTA+MRI were available. At the symptomatic side, we assessed presence of a rim sign on CTA (definition: adventitial calcification <2mm with adjacent soft plaque ⩾2mm in thickness) and IPH presence on T1-weighted-MRI (definition: hyperintense signal in the plaque). We determined the sensitivity, specificity, and association between the two markers.

Results: We included 148 patients (107 men, mean age 68±8years). Of the 60 patients with IPH on MRI, 29 had a rim sign on CTA. Of the 41 patients with a rim sign, 29 had IPH. This yields a sensitivity of 48% and specificity of 86% for a positive rim sign as marker for presence of IPH. Positive rim sign was highly correlated to IPH(OR=5.9,95%CI:2.7-13.5, $P<0.001$).

Conclusions: A rim sign on CTA has a good specificity as marker for IPH presence on MRI, which means a good performance to prove presence of IPH. So, a rim sign on CTA is potentially useful to identify IPH and thereby improve stroke prediction.

Disclosure of interest: No

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INTERNAL AND CORTICAL BORDERZONE INFARCTS IN SYMPTOMATIC INTRACRANIAL ATHEROSCLEROTIC STENOSIS: DIFFERENT HEMODYNAMIC IMPAIRMENT AND RISKS OF RECURRENT STROKE

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Background and aims: Different pathogenesis may lie behind internal (IBZ) and cortical borderzone (CBZ) infarcts attributed to intracranial atherosclerotic stenosis (ICAS). We aimed to explore differences in the clinical and imaging features and risks of recurrent stroke in those with IBZ and CBZ infarcts due to ICAS.

Methods: Patients with acute borderzone infarcts due to 50-99% stenosis of M1 middle cerebral artery were recruited in this cohort study. Presence of IBZ or CBZ infarcts in diffusion-weighted imaging was recorded, which was also classified as isolated IBZ, isolated CBZ and IBZ+CBZ infarcts. CTA-based computational fluid dynamics models were constructed to calculate translesional pressure ratio (PR = post-stenotic pressure/pre-stenotic pressure) of ICAS lesions. Recurrent same-territory ischemic strokes within 3 months despite optimal medical treatment were recorded.

Results: Among 84 patients (median age 62 years; 59 (70.2%) males), 37, 31 and 16 had isolated IBZ, isolated CBZ and IBZ+CBZ infarcts, respectively. PR≤median (OR=3.13, 95%CI 1.20-8.19; p=0.020) were associated with IBZ infarcts, while small cortical infarcts (OR=3.85, 1.50-9.92; p=0.005) were associated with CBZ infarcts. In 68 patients with isolated IBZ or CBZ infarcts, PR ≤median was associated with isolated IBZ infarcts (OR=4.00, 1.12-14.26; p=0.033); more patients with isolated IBZ infarcts had recurrent same-territory ischemic stroke within 3 months than those with isolated CBZ infarcts (17.9% versus 0.0%; log-rank p=0.022).

Conclusions: In borderzone infarcts due to ICAS,IBZ infarcts may be more closely associated with hemodynamic impairment, which may also associate with a higher risk of recurrent stroke in 3 months.

Disclosure of interest: No

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QUANITATIVE VESTIBULAR TESTS CAN ACCURATELY SEPARATE POSTERIOR CIRCULATION STROKE AND VESTIBULAR NEURITIS

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Background and aims: Clinical assessment of the acutely vertiginous patient presenting to emergency-department is superior to neuroimaging in separating posterior-circulation stroke (PCS) and vestibular-neuritis (VN) but remains challenging for the clinician. However, clinical bedside head-impulse-nystagmus-and-test-of-skew (HINTS) test is not perfect in achieving this. This study sought to assess whether quantitative vestibular-tests could help separate PCS and V

Methods: Patients were prospectively recruited from the emergency-department within 72 hours of presentation. Video-nystagmography (VNG), three-dimensional video head-impulses testing (vHIT), vestibular-evoked myogenic potentials (VEMPs) and subjective visual-horizontal (SVH) were performed.

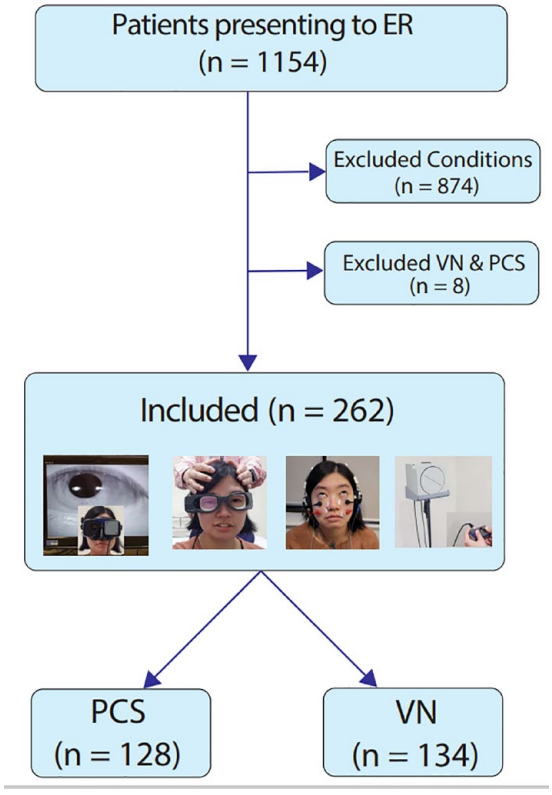
Results: There were 128 PCS and 134 VN patients. Common stroke-territories were: posterior-inferior-cerebellar-artery, basilar-perforators, multi-territory and anterior-inferior-cerebellar-artery (41.4%, 21.1%, 14.1%, 7.8%). Most VN and stroke patients presented with acute vestibular syndrome (96.6%, 61.7%).

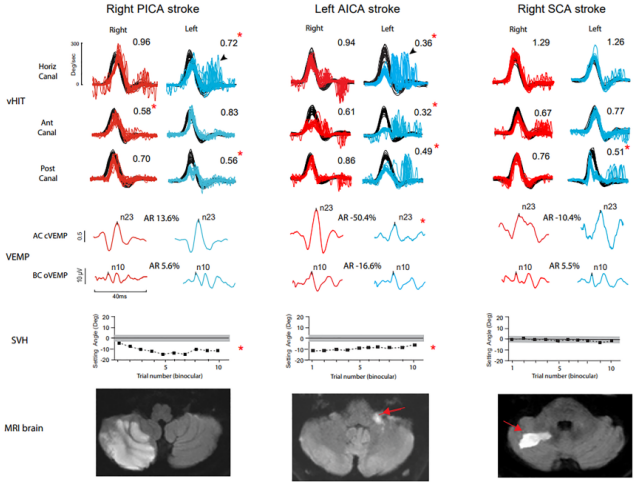
In PCS, absent-nystagmus (53.9%), horizontal (32%) or vertical/torsional (14.1%) nystagmus was recorded whilst in VN, horizontal (98.5%) or vertical/torsional spontaneous-nystagmus (1.5%) was recorded. Ipsilesional horizontal-canal (HC) vHIT-gain was lower in VN than in stroke (0.47±0.24, 0.92±0.20, $p<0.001$). Ipsilesional SVH deviation >2.5° occurred more often in VN than in PCS (97.6% and 24.3%, $p<0.01$).

Table Demographic and clinical data

	Stroke (n=128)	Vestibular neuritis (n=134)	p-value
Mean age	67.6±13.4	55.9±17.0	<0.001
Female, n (%)	45 (35.2)	50 (37.3)	0.798
Vertigo syndrome, n (%)			
Acute vestibular syndrome	79 (61.7)	129 (96.3)	<0.001
Acute transient vestibular syndrome	18 (14.1)	1 (0.7)	<0.001
Acute/Subacute ataxia	20 (15.6)	2 (1.5)	<0.001
Episodic spontaneous vertigo	1 (0.8)	0 (0)	0.494
Episodic positional +/- spontaneous vertigo	1 (0.8)	2 (1.5)	1.000
Non-vertigo	9 (7.0)	0 (0)	0.002
Gaze evoked nystagmus, n (%)	36 (28.2)	0 (0)	<0.001
Head impulse positivity, n (%)	26 (20.3)	131 (97.8)	<0.001
Skew deviation, n (%)	28 (21.9)	3 (2.2)	<0.001
Laterality, n (%)			
Right sided	51 (39.8)	67 (50)	0.267
Left-sided	60 (46.9)	67 (50)	1.000
Bilateral or midline	17 (13.3)	0 (0)	<0.001
Additional symptoms/signs (new or pre-existing), n (%)			
Headache	34 (26.6)	32 (23.9)	0.777
Hearing loss	33 (25.8)	28 (21.9)	0.547
Tinnitus	12 (9.4)	26 (20.3)	0.014
Aural fullness	2 (1.6)	12 (9.4)	0.011
Brainstem/lateralised cerebellar signs	77 (58.7)	3 (2.2)	<0.001
Gait disturbance/ataxia	98 (74.8)	27 (20.4)	<0.001

Abnormal bone-conducted ocular-VEMP (oVEMP) asymmetry-ratio was more common in VN than PCS (50% and 14.4%, $p<0.01$)
Using the ten best discriminators (VNG, vHIT, SVH and oVEMP metrics), VN was separated from PCS with a sensitivity of 92.9% and specificity of 89.8%. Adding VNG and vHIT to the HINTS test enhanced sensitivity and specificity from 95.3% and 63.4% to 96.5% and 80.6%.
Conclusions: Quantitative vestibular-testing helps separate PCS from VN and could improve diagnostic accuracy in the emergency-room.





Disclosure of interest: No

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Evaluation of Adhesive Cardiac Rhythm Monitors for Investigation of Embolic Stroke of Undetermined Source (ESUS)

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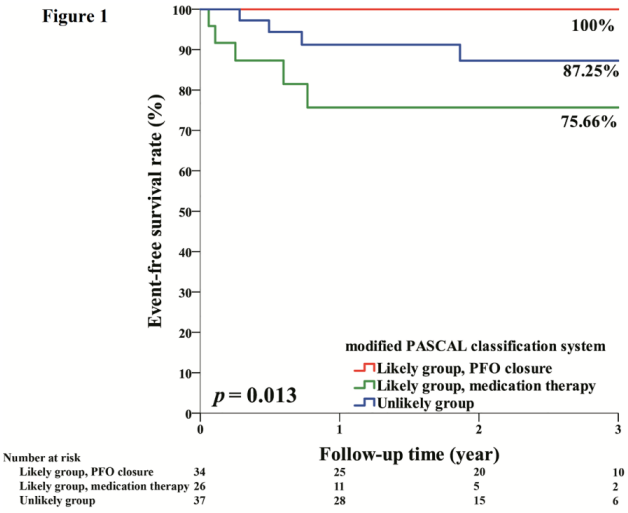
Background and aims: Atrial fibrillation (AF) is a well-known aetiology of embolic stroke and is difficult to identify due to its paroxysmal nature. Optimum duration and modality of cardiac rhythm monitoring to detect AF in patients following possible embolic stroke or transient ischaemic attack (TIA) is unclear. Within our stroke service, we trialled a new cardiac monitoring pathway using AI-led patch technology (Zio XT) in patients following embolic stroke or TIA. We compared this with the previous pathway using traditional Holter monitoring.
Methods: Retrospective comparison of 2 consecutive patient cohorts referred for ambulatory monitoring with either Zio (14-day continuous monitoring) or Holter (24hr or 7-day) following recent diagnosis of ESUS or recurrent TIA. 100 patients in each group.
Results: AF detected in 8.16% of the Zio group vs 1.79% in the Holter group. All patients were subsequently anticoagulated. A separate clinic appointment for monitor fitting was required in 9% of the Zio group vs 98.2% and 100% in the Holter group for 24-hour and 7-day recordings respectively. Waiting time (median) from referral to result was 14 days in Zio group vs 107 days for Holter group. Additional monitoring was requested in 7.14% of Zio group vs 25% of Holter group.
Conclusions: Zio resulted in significantly higher detection of AF. Time from referral to diagnosis and subsequent anticoagulation was also significantly reduced. It also reduced requirement for repeat monitoring due to inconclusive results. Overall, use of Zio has patient and system benefits compared with traditional Holter monitoring in patients with ESUS.
Disclosure of interest: No

Figure 1



Disclosure of interest: No

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PATENT FORAMEN OVALE CLOSURE IN ELDERLY PATIENTS WITH CRYPTOGENIC STROKE: RISK CLASSIFICATION BASED PRACTICE IN REAL-WORLD

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Background and aims: PFO-Associated Stroke Causal Likelihood (PASCAL) classification system is helpful in the decision-making of treatments in patients with cryptogenic stroke (CS) and patent foramen ovale (PFO) among younger-aged. We aim to investigate the efficacy and safety of a modified PASCAL classification system applied to elderly CS patients.
Methods: The cohort of patients over 60 with CS and PFO was from a prospective registry between 2013 and 2022. The risk classification system includes two determinants: high-risk PFO anatomical features and Risk of Paradoxical Embolism score≥5. We classified patients into two risk groups: (1) "likely" group, defined as the presence of either determinant; (2) "unlikely" group, if neither determinant was present. Recurrent ischemic stroke and safey outcomes were analysed.
Results: We enrolled 97 patients (mean age, 69.8 years), and 60 (61.7%) were "likely" group. Thirty-four (56.7%) patients of "likely" group and 8 (21.6%) patients of "unlikely" group received PFO closure (p = 0.001). During a median follow-up of 1.83 years, recurrent ischemic stroke occurred in 3 of 42 patients (7.1%) with PFO closure and 10 of 55 (18.2%) patients with medical therapy alone (hazard ratio = 0.23, 95% confidence interval 0.06–0.85, p = 0.027). Among "likely" group, patients with PFO closure had a better 3-year event-free-survival rate than medical therapy alone (Figure 1, 100% vs 75.66%, p = 0.013). Periprocedural atrial fibrillation occurred in 2 (4.8%) with PFO closure.
Conclusions: The modified PASCAL classification system may be useful in risk stratification in elderly PFO patients with CS.

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H-FABP AS A BIOMARKER OF VASCULAR BRAIN DAMAGE IN TRANSIENT ISCHEMIC ATTACK

Daisy Guamán*[1], Elena Palá[1], Elvira Chocano[1], Marcel Lamana-Vallverdú[1], Anna Penalba[1], Paula García-Rodríguez[1], Marta Rubiera[2], Alejandro Bustamante[3], Alex Rovira Cañellas[4], Soledad Pérez Sánchez[5], Leire Azurmendi[6], Sandrine Reymond[6], Jean-Charles Sanchez[6], Joan Montaner[1,5]

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Background and aims: The accurate diagnosis of transient ischemic attack (TIA) appears to be a challenge in clinical practice. Our objective was to explore the potential value of heart fatty-acid binding protein (H-FABP) for the differential diagnosis of TIA versus mimics.
Methods: A retrospective analysis with data from two large prospective cohorts was performed. We selected 175 patients from the StrokeChip multicenter study and 91 patients from a blood sample collection including patients diagnosed with TIA and available diffusion-weighted imaging (DWI) data. Blood was collected within 6 or 24 hours of symptom onset respectively. H-FABP was measured using a rapid Point-of-care-test (POCT). Biomarker levels were compared between TIA and mimics, and between positive and negative DWI lesions. Accuracy was evaluated with Receiver-operating-characteristic (ROC) curves. Cut offs were obtained using PanelomiX algorithms.
Results: H-FABP levels were higher in patients with TIA compared to mimic [3.10 ng/mL (IQR 2.13 – 4.78) versus 1.70 ng/mL (IQR 1.23-2.38)] p <0.001. Discrimination Area under the curve (AUC) was 0.74 (95% CI: 0.64 – 0.83). The PanelomiX algorithm selected a cut off of >1.55ng/ml for H-FABP, and age >41.5 years. A trend to higher concentrations was

observed in those with acute DWI lesions [3.20 (IQR 2.40-4.10) vs. 2.40 (IQR 1.90–3.77) p=0.17].
Conclusions: H-FABP could emerge as a potential diagnostic biomarker in clinical practice due to its ability to discriminate between patients with and without TIA. The quick and easy performance of POCT measurements allows its implementation in emergency departments and even in primary care centers.
Disclosure of interest: No

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Transient ischemic attacks in patients with active cancer

Morin Beyeler*[1], Pasquale Castigliego[1], Joel Baumann[1], Victor Ziegler[1], Moritz Kielkopf[1], Madlaine Müller[1], Stefan Bauer[1], Adnan Mujanovic[2], Thomas Meinel[1], Thomas Horvath[1], Urs Fischer[3], Johannes Kaesmacher[2], Mirjam Rachel Heldner[1], David Seiffge[1], Marcel Arnold[1], Thomas Pabst[4], Martin D. Berger[4], Babak Navi[5], Simon Jung[1], Philipp Bücke[1]
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Background and aims: Paraneoplastic coagulopathy in stroke patients is associated with specific biomarker changes. It can be the initial manifestation of an unknown occult cancer. Identifying a paraneoplastic coagulopathy is essential in guiding secondary prevention. Early cancer detection potentially improves patient outcomes. However, unlike ischemic stroke, it remains unclear whether a paraneoplastic coagulopathy is associated with transient ischemic attacks (TIA). This study assessed the presence of cancer-related biomarkers in TIA patients and evaluated long-term mortality in patients with and without cancer.
Methods: Active cancer was retrospectively identified in consecutive TIA patients treated at our center between 2015 and 2019. An association between the presence of cancer and cancer-related biomarkers was assessed using multivariable logistic regression. Long-term mortality after TIA was analyzed using multivariable cox regression.

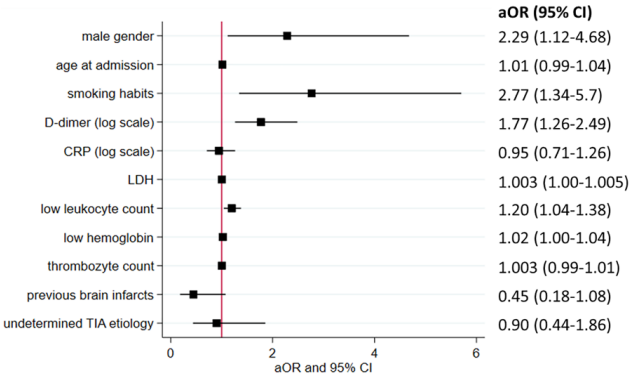

Figure 1.

Results: From the 1436 TIA patients included, 72 had active cancer (5%), of which 17 were occult (1.2%). Cancer-related TIA was associated with male gender (adjusted odds ratio [aOR] 2.29, 95% CI 1.12-4.68), history of smoking (aOR 2.77, 95% CI 1.34-5.7), elevated D-dimer (aOR 1.77, 95% CI 1.26-2.49), lactate dehydrogenase, lower leukocyte count and lower hemoglobin (Figure 1). Long-term mortality was associated with both active cancer (adjusted hazard ratios [aHR] 2.47, 95% CI 1.58-3.88, Figure 2) and occult cancer (aHR 3.08, 95% CI 1.30-7.32).
Conclusions: Cancer-related TIA is not uncommon. Biomarkers known to be associated with cancer-related stroke also seem to be present in TIA patients. Early identification might help to adapt treatment strategies and improve outcomes in this patient population.

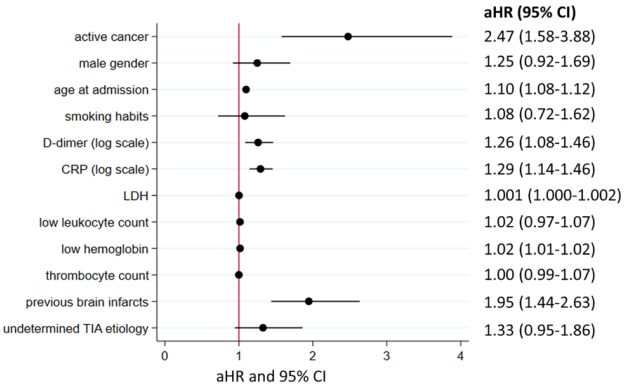

Figure 2.

Disclosure of interest: No

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The REMIT Scale: A Novel Prediction Scale for Embolism in Hyperacute Stroke with Large Vessel Occlusion

Kenichi Sakuta*[1], Takeo Sato[2], Michiyasu Fuga[3], Shinji Miyagawa[1], Hidetaka Mitsumura[4], Hiroshi Yaguchi[1], Kenji Okuno[5], Toshihiro Ishibashi[6], Yuichi Murayama[6], Iguchi Yasuyuki[4]
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Background and aims: Large vessel occlusion (LVO) in hyperacute ischemic stroke occurs mainly by one of two mechanisms, embolism or atherosclerosis. However, the mechanism is difficult to identify prior to treatment. We aimed to investigate the factors associated with embolic LVO in hyperacute ischemic stroke, and to develop a preoperative predictive scale for the event.
Methods: This retrospective multicenter study was conducted with consecutive ischemic stroke patients with LVO who underwent thrombectomy, thrombolysis, or both. The embolic LVO was defined as an occlusion that underwent recanalization with no residual stenosis. Multivariate logistic regression analysis for embolic LVO was performed to identity the independent risk factors. With this approach, a novel prediction scale (Rating of Embolic Occlusion for Mechanical Thrombectomy [REMIT] scale) was developed.

Results: A total of 162 patients (104 men; median age 76 years; interquartile range 68–83) were included in this study. Embolic LVO was observed in 121 patients (75%). Multivariate logistic regression analysis showed that embolic LVO was independently associated with high brain natriuretic peptide (BNP), high National Institutes of Health Stroke Scale (NIHSS) on admission, and absence of non-culprit stenosis (NoCS). The REMIT scale comprises high BNP (>100 pg/dl), high NIHSS (>14) and absence of NoCS, with one point for each risk factor. The frequencies of embolic LVO for the REMIT scale scores were as follows: score 0, 25%; score 1, 60%; score 2, 87%; score 3, 97% (C-statistic 0.80, $P < 0.001$).
Conclusions: The novel REMIT scale has predictive value for embolic LVO.
Disclosure of interest: No

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INDEPENDENT EXTERNAL VALIDATION OF A STROKE RECURRENCE SCORE IN ESUS PATIENTS

Thies Ingwersen*[1], Manuel Olma[2,3], Bernardo Pimentel[1,4], Bastian Cheng[1], Serdar Tütüncü[2], Paulus Kirchhof[5,6,7], Roland Veltkamp[8,9], Joachim Röther[10], Ulrich Laufs[11], Darius G. Nabavi[12], George Ntaios[13], Matthias Endres[2,3,7,14,15,16], Karl Georg Häusler[17], Götz Thomalla[1]
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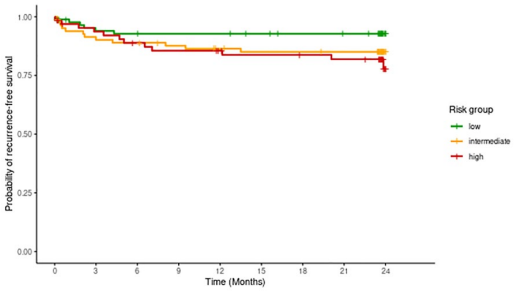
Background and aims: Based on a combination of clinical and imaging factors, a score was previously proposed to stratify patients with ESUS according to their risk of stroke recurrence. Here, we sought to externally validate the performance of the recurrence score in an independent cohort of patients with ESUS.
Methods: The validation dataset comprised data from the PreDAFIS cohort, a subgroup of the MonDAFIS study, which was funded by Bayer Vital GmbH, Germany. The score was calculated using the following variables: age, leukoaraiosis, and multiterritorial stroke. Patients were assigned to low- (score 0-4), intermediate- (5-6) or high-risk (⩾7) groups, as described in the original report. The model was evaluated using discrimination and calibration measures.
Results: Of 1054 patients, 241 (22.9%) were categorised as having ESUS. 30 (13%) patients experienced recurrent ischaemic stroke or TIA during a total follow-up period of 399 patient-years (incidence rate: 7.5 (5.1-10.7) stroke recurrences per 100 patient-years). Patients with a score of ⩾7 had 2.77 (1.04-7.39) times higher risk of stroke recurrence compared to patients with a score of 0-4. The Harrell's C-index was 0.61. The cumulative probabilities of stroke recurrence were 7.2%, 15.0% and 22.0% in the low-, intermediate- and high-risk groups, respectively (log-rank-test $\chi^2=4.5$, p=0.1).
Conclusions: This external validation study of a previously published scoring system supports the threshold of ⩾7 for identifying patients with ESUS who have a higher risk of stroke recurrence.

Risk groups	HR (95%CI)
intermediate vs low	2.13 (0.80 - 5.67)
high vs low	2.77 (1.04-7.39)



Disclosure of interest: No

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INSIGHTS INTO CEREBRAL THROMBI OF PATIENTS WITH ENDOCARDITIS

Beatrice Dell'Acqua*[1], Aurora Semerano[1], Angela Genchi[1], Giorgia Gullotta[2], Manuel Montano Castillo[2], Andrea Bergamaschi[2], Francesca Sanvito[3], Stefano Grassi[3], Franco Simionato[4], Francesco Scomazzoni[4], Pietro Panni[4], Guillaume Saliou[5], Steven David Hajdu[5], Michela Sampaolo[6], Patrik Michel[7], Luisa Roveri[1], Gianvito Martino[2], Massimo Filippi[8], Davide Strambo[9], Marco Bacigaluppi[1]
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Background and aims: Infective endocarditis (IE) is a relevant cause of embolic ischemic stroke. The analysis of cerebral thrombi retrieved by endovascular thrombectomy (EV) in patients with large vessel occlusion stroke and IE represent an additional diagnostic tool. The aim was to identify hallmarks in the composition of thrombus with possible diagnostic value.
Methods: We performed a multimodal analysis comparing cerebral thrombi retrieved by EV in patients with ischemic stroke from IE (n=8) and in control groups: cardioembolic (n=19) and patients with stroke and concomitant other infections (n=9). We performed thrombus culture, PCR, histology to reveal the direct presence of microorganisms. We examined the structural and immune composition of IE thrombi by immunohistochemistry.

Results: Thrombus culture was performed on 2/8 IE thrombi and was positive in 1. PCR amplification and sequencing was performed on 4/8 IE thrombi and detected the presence of bacteria in 4/4, whereas was negative in all 11 controls. On histology bacteria were found in 7/8 IE thrombi, 1 sample displayed the presence of fungal hyphae. No microorganism was visualized in control thrombi. IE thrombi showed significant lower density of red blood cells (Lendrum staining), and lower macrophages counts (CD68+). No differences were found in fibrin, platelets, T-B lymphocytes, and neutrophils. IE thrombi presented a higher prevalence of cell-filopodia-dominant morphology of neutrophil extracellular traps.
Conclusions: The analysis of cerebral thrombi represents an adjunctive tool in diagnostic process of stroke patients with suspected IE. The finding of a peculiar thrombus composition could be useful to recognize IE thrombi.
Disclosure of interest: No

DIAGNOSIS/INVESTIGATION OF STROKE ETIOLOGY

1415

Frequency and clinical relevance of transthoracic and transoesophageal echocardiography after acute ischaemic stroke, transient ischaemic attack, or retinal artery occlusion

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Background and aims: Transthoracic (TTE) and/or transoesophageal echocardiography (TOE) help to define aetiology of ischaemic stroke (IS), transient ischaemic attack (TIA) or retinal artery occlusion (RAO). Present knowledge regarding the frequency and clinical relevance of pathologic echocardiographic findings is limited.
Methods: Retrospective analysis including IS, TIA, or RAO patients, hospitalized within 2015-2019 at the stroke unit and/or Department of Ophthalmology, University Hospital Wuerzburg, Germany. Echocardiographic findings were classified as confirmed (endocarditis, left heart/aortic thrombus) or potential sources of embolism (ulcerated aortic plaque, persistent foramen ovale, left atrial spontaneous echo contrast, cardiac tumor, atrial septal pouch). Medication at admission and discharge was assessed.
Results: Echocardiography was performed in 1877 IS (57% men, 72±13 years, TTE 86%/TOE 55%), 533 TIA (54% men, 70±15 years, TTE 89%/TOE 50%) and 136 RAO patients (64% men, 71±13 years, TTE 99%/TOE 49%). Frequency of confirmed sources of embolism was not significantly different between groups (IS 2.4%; TIA 1.3%; RAO 1.5%; p=0.27), while the frequency of potential sources was (IS 25.3%; TIA 24.8%; RAO 14.7%; p=0.02). Using TOE, number needed to screen (NNS) for starting one patient (without atrial fibrillation) on oral anticoagulation was 15 in IS, 19 in TIA and 67 in RAO. Using TTE only, NNS was 213 in IS. An endocarditis was diagnosed in 4 IS and none of TIA/RAO patients.
Conclusions: Frequency of echocardiography-confirmed sources of embolism was similar in IS, TIA or RAO. Regarding the observed NNS for starting anticoagulation, there is a need of patient´ selection for TTE and TOE, respectively.
Disclosure of interest: No

DIAGNOSIS/INVESTIGATION OF STROKE ETIOLOGY

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HIGH CONTENT OF COLLAGEN, VON WILLEBRAND FACTOR AND NETS CONSTITUTES THE HALLMARKS OF ACTIVE CANCER IN RETRIEVED CLOTS FROM LARGE VESSEL OCCLUSION STROKE PATIENTS

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Background and aims: Although the connection between cancer and stroke is well-known, the specific mechanisms behind the connection remains to be explored. We examined the composition of clots retrieved during thrombectomy in patients with acute large vessel occlusion (LVO) stroke and concomitant active cancer and compared with clots from matched LVO patients without cancer.
Methods: We investigated clots retrieved during thrombectomy from patients with LVO stroke in the RESTORE registry. Patients with concomitant active cancer (defined as cancer diagnosis, metastasis of known cancer, recurrent cancer or receiving cancer treatment, all within 6 months before or after stroke onset) were age- and sex-matched to cancer-free LVO controls. Clots were stained with Martius Scarlett Blue to identify the main histological clot composition, von Willebrand factor and citrullinated histone H3 (Neutrophil Extracellular Traps (NETs)) were quantified by immunohistochemistry.
Results: Clots from patients with active cancer (n=63) had significantly higher proportion of collagen (3.0% vs 0.57%, p=0.013), significantly higher expression of von Willebrand factor (26.7% vs 15.8%, p<0.001), and citrullinated histone H3 (0.62% vs 0.27%, p=0.034) compared to their matched cancer-free controls (n=63). Red-and white blood cells, platelet and fibrin composition did not differ between the groups.
Conclusions: These novel results show that clots from LVO stroke patients with concomitant active cancer are more collagen rich, have higher expression of von Willebrand factor and citrullinated histone H3. In the future, analysis of clot histology may imply underlying cancer in LVO stroke and help identify mechanisms leading to stroke in active cancer.
Acknowledgement: Funding:SFI(13/RC/2073_P2)/Cerenovus
Disclosure of interest: No

DIAGNOSIS/INVESTIGATION OF STROKE ETIOLOGY

1501

MYOSIN-9 IN ACUTE ISCHEMIC STROKE CLOTS EXTRACTED BY MECHANICAL THROMBECTOMY: CORRELATION WITH ETIOLOGY

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Background and aims: Myosin-9 is a contractile protein involved in clot contraction by pushing the procoagulant platelets and fibrin towards the periphery of the clot leading to the formation of a condensed clot, more resistant to fibrinolysis. Acute ischemic stroke (AIS) clots from cardioembolic (CE) origin are stiffer and harder to extract due to their fibrin and platelet-rich composition. We aim to investigate the possibility of etiological differences in the expression of myosin-9 and whether this protein affects the revascularization outcome classified according to the modified 'Thrombolysis in Cerebral Infarction' m(TICI) scale.

Methods: Clots collected per-pass from 50 cases from each stroke etiology, CE, large artery atherosclerosis (LAA) and cryptogenic as part of the CÚRAM RESTORE registry of AIS clots. 3µm sections were immunohistochemically stained for myosin-9 expression. Quantification of the positive staining was performed on Orbit Image Analysis Software. Data was not normal and was analysed by Kruskal-Wallis and Mann-Whitney tests.

Results: Results are reported in Table 1

Conclusions: These findings show that myosin-9 is most abundant in CE clots and is higher in cases with poor revascularization outcomes. Myosin-9 positively correlates with fibrin/platelets and WBCs and may be necessary in characteristics consequent to etiology.

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Disclosure of interest: No

Table 1.

Etiology (n=number clots/50 cases)	% Myosin-9 (Median[IQR])			
CE (n=73)	20[30-12]			
LAA (n=92)	16[22.5-10]			
Cryptogenic (n=66)	17[21.3-9.4]			
P-value	0.04*			
mTICI Score				
mTICI ⩽2a(n=29)	21[35-12]			
mTICI ⩾2b(n=202)	16[23-10]			
P-value	0.045*			
Correlation of Myosin-9 with histology				
Spearman r	**RBCs**	**WBCs**	**Fibrin**	**Platelets/other**
	-0.4344	0.3238	0.2051	0.3588

DIAGNOSIS/INVESTIGATION OF STROKE ETIOLOGY

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DIAGNOSTIC ACCURACY OF MRI FEATURES TO DIFFERENTIATE CHRONIC POST-ISCHEMIC AND CHRONIC POST-HEMORRHAGIC SUBCORTICAL LESIONS

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Background and aims: Incidentally discovered subcortical lesions on brain MRI are part of the daily routine of any neuroradiologist. We aimed to compare the diagnostic accuracy of MRI features to differentiate between chronic post-ischemic and post-hemorrhagic subcortical lesions.

Methods: We retrospectively included consecutive adults with available follow-up MRI in the chronic phase after SSI (small subcortical infarcts) or dICH (deep intracerebral hemorrhage). All patients underwent MRI with FLAIR and SWI sequences (primary event). The imaging at the primary event together with clinical information was used as the reference standard. Two primary-event blinded raters adjudicated SWI quantity, presence of FLAIR cavity, FLAIR rim and conformation of the lesion on follow-up imaging. A scoring system was developed incorporating the different imaging features.

Results: 73 patients with prior SSI and 18 with prior dICH were included: median age 69 (IQR 55-76.5), 36 (40%) females. Inter-reader agreement was substantial for most imaging features. In the final score, large weights favoring a post-hemorrhagic etiology were given to a FLAIR hypointense rim, a hyperintense FLAIR cavity and a SWI rim/hypointensity. Large negative weights favoring a post-ischemic etiology were given to absence of SWI abnormality and a FLAIR hyperintense rim. The optimal cutoff determined was 7.5 points, resulting in a sensitivity of 1.00 and specifity of 0.99 (optimism-corrected AUC 0.987, 95% CI 0.943-1.00).

Conclusions: MRI features, especially when combined showed high accuracy to differentiate post-ischemic and post-hemorrhagic subcortical lesions in the chronic phase. MRI features might be helpful to guide clinical decisions when medical history is unobtainable.

Disclosure of interest: No

DIAGNOSIS/INVESTIGATION OF STROKE ETIOLOGY

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DECREASED LEVELS OF CEREBROSPINAL FLUID Aβ 38, 40, 42, AND 43 IN SPORADIC AND HEREDITARY CEREBRAL AMYLOID ANGIOPATHY

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Background and aims: Vascular Aβ accumulation is the pathological hallmark of cerebral amyloid angiopathy (CAA). The composition of cerebrospinal fluid (CSF) may reflect ongoing pathological processes in the brain, and may serve as diagnostic biomarker of CAA. We studied the diagnostic potential of the peptides Aβ38, Aβ40, Aβ42, and Aβ43 in patients with sporadic CAA (sCAA), and hereditary Dutch-type CAA (D-CAA).
Methods: Aβ peptides were quantified by immunoassays in a discovery cohort (26 sCAA patients and 40 controls), a validation cohort (40 sCAA patients and 37 controls), and in 10 patients with presymptomatic and 12 patients with symptomatic D-CAA and 54 age-matched controls. Levels of Aβ peptides were compared between patients and controls, and adjusted for age and sex by linear regression. To determine diagnostic accuracy, the area-under-the-curve (AUC) was calculated using a receiver operating characteristic curve (ROC).
Results: In all cohorts, we found significantly decreased levels of all Aβ peptides in patients with sCAA and D-CAA compared to controls. We found AUC values between 0.65 and 0.95 for the discrimination of sCAA and controls. The highest AUC values were observed for Aβ42 (sCAA versus control for discovery: 0.90 (95% CI: 0.82-0.99); for validation: 0.94 (95% CI: 0.89-0.99)) and Aβ43 (AUC of sCAA versus control for discovery: 0.95 (95% CI: 0.88-1.00); for validation: 0.91 (95% CI: 0.83-1.0)).
Conclusions: The combination of CSF Aβ38, Aβ40, Aβ42, and Aβ43 has potential to differentiate sCAA and D-CAA from controls, and may be applied in clinical practice when the diagnosis of sCAA is uncertain.
Disclosure of interest: No

DIAGNOSIS/INVESTIGATION OF STROKE ETIOLOGY

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Vertigo - the difficult therapy decision in the emergency setting

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Background and aims: In the acute setting, the differentiation of peripheral vertigo and acute ischemic stroke (AIS) poses a challenge. After introduction of simulation training in 2017 the number of patients treated with intravenous thrombolysis (IVT) for suspected AIS who were later diagnosed with peripheral vertigo increased.
Methods: Patients admitted to the hospital from 2014 to 2022 with Isolated vertigo were prospectively registered. Additionally, patients with suspected AIS treated with IVT were prospectively filed. After diagnostic workup, IVT-treated patients were classified as stroke or stroke mimics. Both patient groups were compared to the proportion of patients with peripheral vertigo not treated with IVT.
Results: Before introduction of simulation training, 24 vertigo patients (4.9%) were treated with IVT, of which 9 (37.5%) were diagnosed as stroke mimics. After introduction of simulation training, 110 vertigo patients (9.8%) were treated with IVT, of which 74 (67.3%) were diagnosed as stroke mimics ($p<0.001$). The proportion of IVT-treated stroke patients among all vertigo patients remained stable at 3.1% in 2014 and 3.2% in 2021 (ns).
Hospital admissions due to vertigo increased from 439 patients in 2014 to 599 patients in 2021 (+36%, $p<0.001$). Admissions to the department of Neurology increased by 100% and treated 51.9% of all vertigo patients admitted to the hospital in 2021 ($p<0.001$).
Conclusions: Increased IVT treatment in vertigo patients led to a significant rise of stroke mimics without increasing the rate of IVT treated vertigo patients with stroke. We underline the need for quality improvement within the management of vertigo patients.
Disclosure of interest: No

DIAGNOSIS/INVESTIGATION OF STROKE ETIOLOGY

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ASSOCIATION OF STROKE AND MORTALITY WITH CEREBRAL MICROBLEEDS: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and aims: Cerebral microbleeds (CMBs) are a unique characteristic of ischemic stroke and hemorrhagic transformation with significant cognitive, functional, and overall mortality. The current study investigated the role of CMBs with mortalities in stroke patients.
Methods: A comprehensive literature search was performed in various electronic databases, including PubMed, Embase, Cochrane Library, CINAHL, and Google Scholar up to 10th January 2023. Pooled Odds ratios (ORs) with 95% Confidence Intervals (CIs) were calculated to determine the association. Sensitivity analysis was performed to detect the heterogeneity between studies, and Begg's funnel plot assessed any publication biases.
Results: We identified 13 retrospective cohort studies with 2005 CMB and 8531 non-CMB patients, including 9 from Caucasian and 4 from Asian populations. Our findings revealed a significant protective association between CMB presence and mortality (OR=0.63, 95% CI=0.48-0.81). Moreover, a significant protective relationship was also observed between all-cause mortality and presence of lobar (OR=0.55, 95% CI=0.42-0.71), deep (OR=0.08, 95% CI=0.04-0.16), and mixed (OR=0.07, 95% CI=0.04-0.15) CMBs. Our findings revealed a significant protective association between CMB presence and cardiovascular associated mortality (OR=0.45, 95% CI=0.29-0.70). However, no significant relationship was observed between stroke associated mortality with the presence or absence of CMB (OR=0.72, 95% CI=0.31-1.64). Subgroup analysis depicted a significant protective association between lobar CMB presence and mortality in Caucasians (OR=0.56, 95% CI=0.42-0.75) but not in the Asian population (OR=0.98, 95% CI=0.60-1.60).
Conclusions: The results indicated a protective association between all-cause mortalities and the presence or absence of CMBs in patients.
Disclosure of interest: No

DIAGNOSIS/INVESTIGATION OF STROKE ETIOLOGY

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BLOOMING EFFECT IN SUSCEPTIBILITY-WEIGHTED IMAGING AS A MARKER OF VERTEBRAL ARTERY DISSECTION IN MEDULLARY INFARCTION

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Background and aims: The prevalence of ischemic stroke caused by arterial dissection is known to be about 2-3%, whereas dissection of the vertebral artery consists of 10-29% of medullary infarction. Blooming effect on susceptibility-weighted imaging (SWI) at intracranial artery has been known as intramural hematoma which is occurred by intracranial artery dissection. We aim to investigate blooming effect in SWI as a marker of arterial dissection in medullary infarction patients.
Methods: Data of all medial and lateral medullary infarction patients proven by brain magnetic resonance (MR) imaging who underwent SWI from 2014 to 2021 were collected in a single center, and their clinical and radiological findings were analyzed.
Results: A total of 79 cases of medullary infarction were registered. 12 patients (15.1%) were classified as vertebral artery dissection by MR angiography. Among the 67 patients who showed normal, stenosis or occlusion in MR angiography, 14 patients without arterial calcification were newly classified as dissection according to blooming effect in SWI. Patients with blooming effects in SWI were younger, had higher high-density lipoprotein cholesterol levels, and lower severity of stroke symptom with favorable outcome. Five patients showed normal angiographic findings but blooming effects were noted along the posterior inferior cerebellar artery (PICA), which might indicate PICA dissection.
Conclusions: Blooming effect in SWI may be a marker of arterial dissection in medullary infarction patients and the proportion of arterial dissection could be more prevalent than previous studies. These patients may have better prognosis and may not require life-long antithrombotic therapy.
Disclosure of interest: No

DIAGNOSIS/INVESTIGATION OF STROKE ETIOLOGY

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Measurement of GFAP in nasal exudate in the differential diagnosis between ischemic and hemorrhagic stroke

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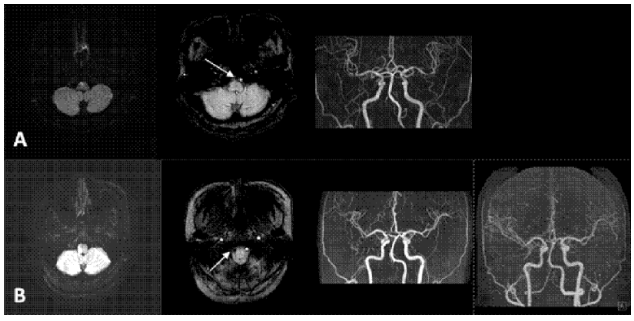
Background and aims: Differential diagnosis between ischemic and hemorrhagic stroke in the acute stage is one of the major challenges of neurovascular research. Several biomarkers have been studied,but attempts to date have focused on determining their blood levels. Recently, cerebral lymphatic drainage towards the nostrils has been discovered, giving us the chance to study nasal exudate looking for biomarkers of neural damage. We sought to confirm whether glial fibrillar acidic protein (GFAP)levels in nasal exudate could identify the hemorrhagic nature of the acute stroke.
Methods: We studied GFAP nasal exudate levels in 5ischemic(IS)and 5 hemorrhagic stroke(ICH) patients. All patients underwent neurological examination assessed by National Institutes of Health Stroke Scale (NIHSS), brain computed tomography (CT) to the differential diagnosis of stroke subtype, laboratory tests and measurement of GFAP levels in nasal exudate
Results: The GFAP levels in nasal exudate were higher in ICH patients (0.18 $\pm$ 0.12 pg of GFAP/mg in IS group vs. 0.91 $\pm$ 0.87 pg of GFAP/mg in ICH group, p =0.02, (95% CI 0,06-0,16)). The area under the receiver operating characteristic (ROC) curve for ischemic/hemorrhagic stroke discrimination was 0.840 (95% CI 0.81-0.95), cut-off point of 0.06 pg of GFAP/mg, with a sensitivity of 100% and a specificity of 80%
Conclusions: Our findings suggest that GFAP levels in nasal exudate may be useful in the acute stage for the differential diagnosis between ischemic and hemorrhagic damage in acute stroke patients. They also open a potential field to study other biomarkers in nasal exudate in several neurological disorders



Disclosure of interest: No

DIAGNOSIS/INVESTIGATION OF STROKE ETIOLOGY

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HIGH RESOLUTION MAGNETIC RESONANCE VESSEL WALL IMAGING: A VALUABLE ADDITION TO ETIOLOGIC STROKE WORK-UP

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Background and aims: High Resolution Vessel Wall Imaging (HR VWI) is used to differentiate intracranial vasculopathies. This study aims to evaluate HR VWI findings, their impact on ischemic stroke's (IS) etiologic classification and the subsequent therapeutic changes.
Methods: We retrospectively reviewed acute ischemic stroke patients hospitalized in our stroke unit from January 2016 to December 2020, and in whom HR VWI was performed for evaluation of an intracranial stenosis, a presumptive CNS vasculitis or IS of undetermined origin. The HR VWI findings were categorized in normal findings, intracranial atherosclerotic disease, dissection, vasculitis, unspecific enhancement and others. The toast classification before and after HR VWI and subsequent therapeutic changes were analyzed.
Results: 316 patients were included. The mean age was 60 years +/-16.8 SD. HR VWI evaluated an intracranial stenosis in 34%, a presumptive CNS vasculitis in 26%, and IS of undetermined origin in 38%. HR VWI revealed an intracranial atherosclerotic disease in 30.7%, suspected vasculitis in 6%, dissection in 3.8%, unspecific enhancement in 4.11% and normal findings in 50.6%. When performed to evaluate a presumptive CNS vasculitis, HR VWI identified positive signs in 23%. Only 8.5% had a confirmed vasculitis diagnosis. Intracranial stenosis was atheromatous in 82.3%. 14.1% of cerebral infarct of undetermined origin were attributed to atherosclerosis.

HR VWI modified the etiologic classification of IS in 17.4%, it resulted in therapeutic changes in 7%.
Conclusions: In our cohort, HR VWI had an impact on AIS etiologic classification and subsequently is considered a valuable addition to the IS work-up.
Disclosure of interest: No

DIAGNOSIS/INVESTIGATION OF STROKE ETIOLOGY

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Etiology of stroke in patients undergoing early and late repeated mechanical thrombectomy: multicentre study

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Background and aims: Repeated mechanical thrombectomy (rMT) is reported to occur in 1-2% of all patients undergoing MT and little is known about the etiology of stroke in this subgroup of patients undergoing rMT. Our aim was to characterize the etiology of stroke according to the timepoint of rMT.
Methods: Multicenter retrospective study based on three local registries of consecutive stroke patients undergoing acute revascularization therapy. Inclusion of patients who underwent at least two MT (rMT) who were subgrouped in "early rMT" (second MT within 21 days after first MT) and "late rMT" (second MT >21 days after first MT). Comparison of baseline characteristics and stroke etiology in both groups. Stroke etiology was classified using the criteria of TOAST and ASCOD classification.
Results: Among a total of 3735 patients undergoing MT, 50 patients (1.3%) underwent rMT. The groups of late and early rMT did not differ in respect to demographic characteristics and vascular risk factors. The distribution of stroke etiology was different in both groups (p=0.002), with the group of early rMT having more frequently a hypercoagulable state (26% Vs. 0, p=0.008). In 6 patients, a different stroke etiology in comparison to the first MT was found at the time point of rMT.
Conclusions: Ischemic stroke patients undergoing repeated MT present different profiles of stroke etiology according to time point of LVO recurrence.
Disclosure of interest: No

DIAGNOSIS/INVESTIGATION OF STROKE ETIOLOGY

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CAN ATRIAL FIBRILLATION RISK ASSESSMENT SHORTEN THE OVERALL DURATION OF PROLONGED CARDIAC MONITORING IN PATIENTS WITH EMBOLIC STROKE OF UNKNOWN CAUSE?

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Background and aims: Prolonged cardiac monitoring is recommended for the detection of hidden Atrial Fibrillation (AF) in ESUS patients. In the FANTASTIC study (Untreated atrial fibrillation screening following stroke in Andalusia), we analyzed the possibility of shortening this time based on AF risk profiles.
Methods: Multicentre, prospective, study of 30-day prolonged cardiac monitoring in ESUS patients in Andalusia (Spain). Monitoring started in the first 7 days after stroke with Holter Bittium Faros 360 (Apoplex) and analysis of the tracing using SRA software, which detects AF and/or risk of AF (absence of risk vs increased probability of AF). Risk profiles in the first two hours and per week of monitoring are analyzed and compared with the final detection of AF.
Results: 106 patients were monitored from February to November 2022. AF detection rate was 13.2% (14 patients). Obtaining an "Absence of AF risk" profile in the first two hours of monitoring was associated with no final AF detection in 67.8% of patients vs. 7.7% in whom AF was detected ($p<0.01$). This was also observed in the remaining study weeks (week 1: 46.7% vs 14.3%, $p<0.01$; in week 2: 51.1% vs 7.1%, $p<0.01$; week 3: 42.4% vs 7.1%, $p<0.01$; and week 4: 46.7% vs 0%, $p<0.01$).
Conclusions: Automated cardiac tracing analysis using SRA software is effective for AF detection in routine clinical practice. Obtaining a profile of no AF risk in the first two hours has a high negative predictive value, which may help select patients that benefit most from prolonged monitoring.
Disclosure of interest: No

DIAGNOSIS/INVESTIGATION OF STROKE ETIOLOGY

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DETECTION OF ATRIAL FIBRILLATION IN PATIENTS WITH EMBOLIC STROKE OF UNKNOWN CAUSE USING SRA SOFTWARE (FANTASTIC STUDY)

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Background and aims: Hidden atrial fibrillation (AF) remains the most common cause after ESUS. We present the FANTASTIC study (Untreated atrial fibrillation screening following stroke in Andalusia) findings of 30-day prolonged cardiac monitoring in ESUS, the AF detection rate, and patient profile.
Methods: Multicentre, prospective study of 30-day prolonged cardiac monitoring in ESUS patients in Andalusia (Spain). Monitoring with Holter Bittium Faros 360 (Apoplex) and analysis of the tracing using SRA software, which detects AF and/or AF risk. Patients were included in the first 7 days after stroke. Baseline population characteristics were collected and blood NT-proBNP was measured.
Results: 106 patients included during the first 9 months. AF was detected in 14 patients (13.2%). Comparing patients with and without AF detection, baseline characteristics were similar, except that AF patients were mostly females (64.3% vs 26.1%, p=0.010) of older age (74 vs 67.18, p=0.041). The NT-proBNP value was higher in AF patients (343.456pg/mL vs 205.402pg/mL) with a trend towards significance (p=0.052), as was the association with cerebral large vessel occlusion (LVO) (46.2% vs 22.7%, p=0.071). Regarding tracing analysis, obtaining a "No AF Risk" rating within the first two hours of monitoring was strongly associated with not detecting AF after 30 days (67.8% vs 7.7%, $p<0.001$).
Conclusions: The use of prolonged Holter monitoring guided by IA systems seems effective in detecting AF in ESUS patients. Older women remain the most at-risk patients, and the presence of elevated NT-proBNP and stroke secondary to LVO may point to hidden AF as a cause.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Impact of central blood pressure on poor outcomes in patients with embolic stroke of undetermined source

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Background and aims: We investigated the prognostic impact of central blood pressure (BP) on outcomes in patients with embolic stroke of undetermined source (ESUS). The prognostic value of central BP according to ESUS subtype was also evaluated.
Methods: We recruited ESUS patients who obtained central BP parameters (central systolic BP [SBP], central diastolic BP [DBP], central pulse pressure [PP], augmentation pressure [AP], and augmentation index [AIx]) during admission. The ESUS subtype was classified as arteriogenic embolism, minor cardioembolism, two or more causes, and no cause. Major adverse cardiovascular event (MACE) was the primary outcome and defined as stroke recurrence, acute coronary syndrome, hospitalization for heart failure, or death.
Results: Over a median of 45.8 months, 746 patients with ESUS were enrolled and followed up. The patients had a mean age of 62.8 years, and 62.2% were male. Multivariable Cox regression analysis showed that central SBP and PP were associated with MACE (central SBP: hazard ratio [HR] 1.013, 95% confidence interval [CI] 1.003–1.023; central PP $>$ 50 mmHg: HR 1.565, 95% CI 1.012–2.421). All-cause mortality was independently associated with AIx (AIx $>$ 25%: HR 3.377, 95% CI 1.518–7.513). In patients with no cause ESUS, central SBP and PP, AP, and AIx were independently associated with MACE. AP and AIx were independently associated with all-cause mortality.
Conclusions: We demonstrated that central BP predicts poor long-term prognosis in ESUS patients, especially those with no cause subtype.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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EVOLUTION OF ETIOLOGY BETWEEN FIRST-EVER AND RECURRENT YOUNG-ONSET ISCHEMIC STROKE

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Background and aims: Scarce data exist on the etiology of first-ever and recurrent ischemic stroke (IS) among young adults. We analyzed the etiology of first-ever and recurrent events and assessed the differences between them.
Methods: Patients aged 15-49 years with a first-ever IS occurring between 1994-2007 were included into the Helsinki Young Stroke Registry. In this retrospective cohort study, data on recurrent ISs were searched from the Statistics Finland and the Care Register until the end of 2017, and from patient records until the end of 2020. All first-ever and recurrent ISs were classified using A-S-C-O and Trial of Org 10172 in Acute Stroke Treatment (TOAST) classifications. Related-samples statistics were applied.
Results: A total of 970 patients were included (median age 44 years, interquartile range 37-47, 38% women), of which 155 (16.0%) patients had recurrent IS, with 8 (5.2%) fatal cases and 5 (3.2%) cases without record verification available. Within the remaining 150 cases, recurrencies were more often due to definite cardioembolism (10.7% vs. 18.0%, p=0.013), while the proportions of other definite A-S-C-O subgroups remained the same. With TOAST classification, the proportion of true cryptogenic ISs (5b) decreased (16.0% vs. 6.7%, p=0.004), while the proportion of patients with incomplete evaluation (5c) increased (7.3% vs. 19.3%, p=0.005). Other TOAST phenotypes remained the same.
Conclusions: The proportion of definite cardioembolism increased at recurrency using the A-S-C-O classification, and the amount of cryptogenic ISs decreased using the TOAST classification, despite an increase in cases with incomplete evaluation. Most etiologies, however, remained the same.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Lipid management in Ischemic Stroke or Transient Ischemic Attack in China: Result from China National Stroke Registry III

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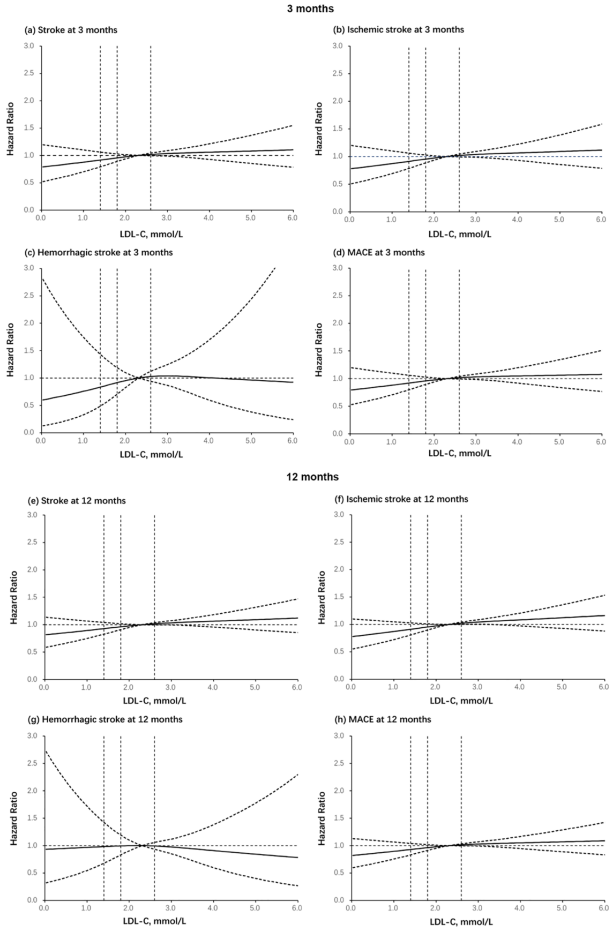
Background and aims: Dyslipidaemia is a significant risk factor for ischemic stroke and TIA. This study aimed to assess the management of

low-density lipoprotein cholesterol (LDL-C) and the goal achievement and to investigate the association between baseline LDL-C, lipid-lowering treatment (LLT), and stroke recurrence in ischemic stroke or TIA patients.

Methods: We derived data from the Third China National Stroke Registry (CNSR-III). The primary outcome was new stroke, LDL-C goal (<1.8mmol/L and <1.4mmol/L, respectively) achievement rates, and LLT compliance within 3, 6, and 12 months. The association of baseline LDL-C level, LLT at discharge, and outcomes were assessed.

Results: Among 15,166 patients, over 90% of patients received LLT during hospitalization and 2 weeks after discharge; LLT compliance was 84.5% at 3 months, 75.6% at 6 months, and 64.8% at 12 months. LDL-C goal achievement for 1.8mmol/L and 1.4mmol/L was 35.4% and 17.6% at 12 months. LLT at discharge was associated with reduced risk of ischemic stroke recurrence (HR=0.687, 95% CI: 0.480-0.985, p=0.0411) at 3 months. The rate of LDL-C reduction from baseline to 3-month follow-up was not associated with a reduced risk of stroke recurrence, and MACE at 12 months. Patients with baseline LDL-C ⩽1.4mmol/L had a numerically lower risk of ischemic stroke and MACE at 3 months and 12 months.

Conclusions: The goal achievement of LDL-C has increased mildly in stroke and TIA population in China. Lowered baseline LDL-C level was significantly associated with decreased short- and long-term risk of ischemic stroke. LDL-C<1.4mmol/L might be a safe standard.



Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Lipid paradox and statin pretreatment in acute ischemic stroke

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Background and aims: This study investigated the association between LDL-C levels and early vascular outcomes and assessed the potential interaction effect between LDL-C and statin pretreatment on early outcomes among acute ischemic stroke patients.

Methods: This was a retrospective analysis of a prospective, multicenter, nationwide registry of ischemic stroke patients with baseline LDL-C. The subjects were divided into 3 groups according to LDL-C levels: low LDL-C(⩽100mg/dl); intermediate LDL-C(>100, <130mg/dl); and high LDL-C(⩾130mg/dl). The primary early vascular outcome was a composite of stroke, myocardial infarction and all-cause mortality within 3months. The associations of LDL-C levels as a continuous variable and the risks of primary outcome using Cox proportional hazards models with restricted cubic splines were explored.

Results: A total of 48044 patients(age, 69±12; male, 58.8%) were analyzed. The mean LDL-C level was 107.6±37.5mg/dl, and 19.8% of patients received statin pretreatment. The 3groups showed significant differences in the 3-month primary outcome, with highest events in the low LDL-C group; after adjustment, no significant associations with the 3-month primary outcome remained. U-shaped nonlinear relationships of LDL-C levels with the 3-month primary outcome were observed($P_{non\text{-}linearity}<0.001$), with substantial relationships in the no pretreatment subgroup but non-significant relationships in the statin pretreatment subgroup.

Conclusions: The relationships between baseline LDL-C levels and early outcomes are complex but appear to be paradoxical in patients with low LDL-C and no statin pretreatment. The results suggest that statin pretreatment could offset the paradoxical response of low LDL-C on early vascular outcomes. Further study would be warranted.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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QUALITY OF LIFE IN PATIENTS WITH EXCELLENT 3-MONTH FUNCTIONAL OUTCOME AFTER FIRST-EVER ISCHEMIC STROKE: A RUNNING ANALYSIS FROM THE FRAILTY STUDY

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Background and aims: Ischemic stroke (IS) may have impact on long-term health-related quality of life (HRQoL) also in the patients with good outcome and tools mostly used for the assessment of outcome may underestimate or not reflect all relevant sequels. Our aim was to assess HRQoL in the patients with excellent functional outcome after IS.

Methods: Consecutive IS patients enrolled in the prospective FRAILTY (Factors Affecting the Quality of Life After Ischemic Stroke in Young Adults; ClinicalTrials.gov: NCT04839887) study with excellent 3-month functional outcome (mRS 0-1) were analysed. Stroke Impact Scale (SIS) version 3.0 and Hospital Anxiety and Depression Scale (HADS) were used for the HRQoL assessments and patients were compared according to NIHSS (0, ⩾ 1), age (50 <, ⩾ 50 years) and sex.
Results: In total, 145 patients (56.7% men, mean age 61.3 ± 13.3 years) were analysed and 72.4% of them had score 0 in NIHSS and mRS. Patients with NIHSS ⩾ 1 had lower scores in all multidimensional stroke outcomes except emotions and mobility compared to those with NIHSS 0. Significant negative correlations were found between NIHSS and five domains of the SIS 3.0, including strength, memory/thinking, communication, hand function, activities of daily living, and between age and mobility. No differences and correlations were found between all investigated subgroups in HADS domains.
Conclusions: Despite overall excellent 3-month functional outcome after IS, patients with NIHSS ⩾ 1 showed substantially poorer HRQoL compared to those with NIHSS 0.
Acknowledgment: Supported by the grant of MH CR, n. NU22-09-00021.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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EARLY NEUROLOGICAL IMPROVEMENT AND ITS RELATIONSCHIP TO ALTEPLASE TREATMENT AND LONG TERM OUTCOME IN THE WAKE-UP STUDY

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Background and aims: To evaluate the relationship of baseline factors and treatment on the occurrence of early neurological improvement (ENI) in the WAKE-UP trial, and the association of ENI with long-term favorable outcome in patients treated with intravenous thrombolysis.
Methods: ENI was defined as a decrease in NIHSS of ⩾8 or a decline to 0-1 24 hours after admission. Favorable outcome was defined as modified Rankin Scale score of 0-1 at 90 days. We performed group comparison and multivariable analysis of baseline factors associated with ENI and performed mediation analysis to evaluate the effect of ENI on the relationship between intravenous thrombolysis and favorable outcome.
Results: ENI occurred in 93/384 patients (24.2%) and more often occurred in patients who received treatment with alteplase (62.4% vs. 46.0%, p=0.009), had smaller lesion volume (5.51ml vs. 10.9ml, p= <0.001) and no large vessel occlusion (7/93 (12.1%) vs. 40/291 (29.9%), p= 0.014). In multivariable analysis, treatment (OR 1.97, 95%CI 0.954-1.100), smaller stroke volume (OR 0.965, 95%CI 0.932-0.994), and shorter time from symptom recognition to treatment (OR 0.994, 95%CI 0.989-0.999) were independently associated with ENI. Patients with ENI had higher rates of favorable outcome (80.6% vs. 31.3%, p=<0.001). ENI significantly mediated the association of treatment with good outcome.
Conclusions: Intravenous alteplase increases the odds of ENI, especially when given early. In patients with large vessel occlusion, ENI is rarely observed without thrombectomy. ENI represents a good surrogate early marker of treatment effect, as more than a third of good outcome is explained by ENI.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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HOW DOES STROKE ASSOCIATED PNEUMONIA AFFECT RISK OF IN-HOSPITAL MORTALITY ASSOCIATED WITH SEVERE STROKE? A FOUR-WAY DECOMPOSITION ANALYSIS OF A NATIONAL COHORT OF STROKE PATIENTS

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Background and aims: Severe strokes, and stroke associated pneumonia (SAP) are each associated with increased in-hospital mortality. However, it is unclear what role SAP plays in the risk of in-hospital mortality associated with a severe stroke at admission.
Methods: Using UK Sentinel Stroke National Audit Programme data (2013-2018), we modelled the 'total' effect for severe stroke on risk of in-hospital mortality. Through four-way decomposition methodology, we broke down the 'total' observed risk into four components: (1) the direct 'stroke severity on outcome only' effect, (2) the pure indirect effect of stroke severity mediated via SAP only, (3) the interaction between stroke severity and SAP when mediation is not present and (4) when mediation via SAP is present.
Results: Of 339,139 stroke patients included, 9.4% had SAP and 15.6% died in hospital. Of SAP patients, 45% died vs 12% of non-SAP patients. The risk ratio for in-hospital mortality associated with severe vs mild/moderate stroke (i.e. total effect) was 4.72. Of this, 43% increased risk was due to additive SAP interaction, this increased to 50% and 62% for 'very severe' stroke and when severity was defined by level of consciousness, respectively. The remaining excess relative risk was due to severity on outcome only i.e. no evidence for mediation via SAP.
Conclusions: Our data suggest that prioritising SAP prevention in severe stroke patients may contribute significantly to improving in-hospital survival. Patients with severe stroke may see a 43% reduction in risk of in-hospital mortality if SAP could be avoided.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Prognostic significance of plasma CXCL12 in acute ischemic stroke patients with diabetes mellitus: findings from the CATIS trial

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Background and aims: The associations between baseline CXC chemokine ligand-12 (CXCL12) levels and clinical outcomes after acute ischemic stroke are conflicting and diabetes mellitus may contribute to these conflicting. The aim of present study was to evaluate the prognostic effect of plasma CXCL12 among ischemic stroke patients stratified by diabetes mellitus status.
Methods: Secondary analysis of data on 3,255 participants from the China Antihypertensive Trial in Acute Ischemic Stroke (CATIS) trial with a baseline measurement of plasma CXCL12 levels. We evaluated the associations between plasma CXCL12 levels and 2-year cardiovascular events, and recurrent stroke using Cox regression models in acute ischemic stroke patients with and without diabetes mellitus.
Results: The association between plasma CXCL12 and cardiovascular events, and recurrent stroke at 1 year and 2 years were modified by diabetes mellitus status (all $P \leqslant 0.04$ for interaction). In 567 patients with diabetes mellitus, compared to those with plasma CXCL12 levels in the lowest quartile, participant with highest quartile of plasma CXCL12 levels had a higher risk of cardiovascular events [HR, 95%CI 2.93 (1.15-7.48) at 1 year, 2.39 (1.13-5.04) at 2 years] and recurrent stroke [HR, 95%CI, 4.11 (1.29-13.07) at 1 year, and 2.94 (1.23-7.07) at 2 years]. However, no associations between plasma CXCL12 and clinical outcomes in patients without diabetes mellitus were found (all $P > 0.05$).
Conclusions: Elevated plasma CXCL12 was significantly associated with increased risk of cardiovascular events and recurrent stroke only in ischemic patients with diabetes mellitus.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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enlarged perivascular spaces in basal ganglia portend hemorrhagic stroke after acute ischemic stroke or transient ischemic attack

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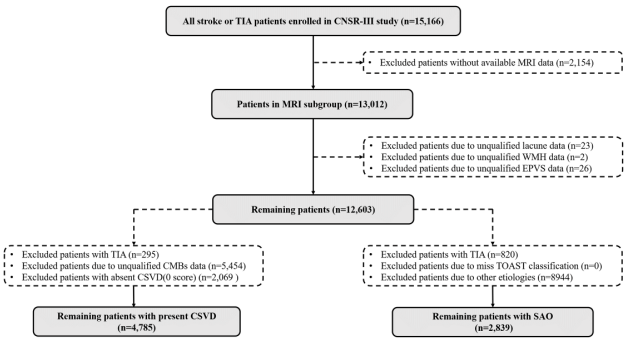
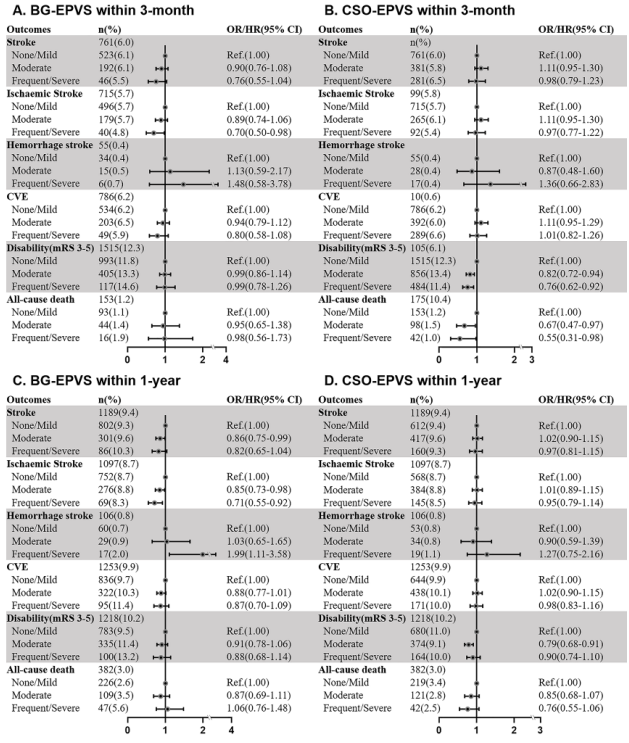
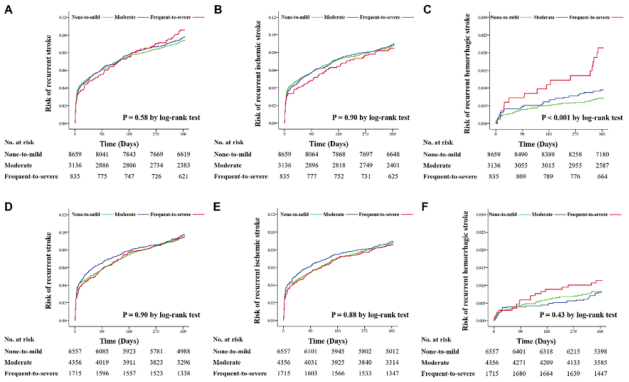
Background and aims: It remains unclear whether enlarged perivascular spaces (EPVS) predict recurrent events in patients with acute ischemic stroke (AIS) or transient ischemic attack (TIA).
Methods: Data were obtained from the Third China National Stroke Registry study. We estimated EPVS in basal ganglia (BG) and centrum semiovale (CSO) using a semi-quantified scale (Grade from 0 to 4). Using multivariable Cox and logistic regression analyses, associations of EPVS with 3-month and 1-year adverse outcomes (including recurrent stroke, ischemic stroke, hemorrhagic stroke, combined vascular event) were explored. Furthermore, sensitivity analyses of any association of cerebral small vessel disease (CSVD) at the baseline and development of a small arterial occlusion (SAO) were conducted.
Results: Among 12603 patients with AIS/TIA, their median age was 61.7 ± 11.6 years, and 68.2% were men. Frequent-to-severe BG-EPVS was associated with a decreased risk of recurrent ischemic stroke (HR 0.70, 95% CI 0.50–0.98, P = 0.04) but an increased risk of hemorrhagic stroke (HR 0.71, 95% CI 0.55–0.92, P = 0.01) at 1 year after AIS/TIA. Both frequent-to-severe BG-EPVS (HR 0.43, 95% CI 0.21–0.87, P = 0.02) and CSO-EPVS (HR 0.58, 95% CI 0.35–0.95, P = 0.03) were associated with a decreased risk of subsequent ischemic stroke in patients with SAO during 1-year follow-up.
Conclusions: BG-EPVS may increase the risk of hemorrhagic stroke in patients already with AIS/TIA within 1-year. Therefore, caution is recommended when selecting antithrombotic agents for secondary stroke prevention in patients with AIS/TIA and more severe BG-EPVS.







Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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PRE-STROKE PHYSICAL INACTIVITY IS CORRELATED WITH ADL DEPENDENCY 3 MONTHS AFTER STROKE

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Background and aims: Physical inactivity before stroke is associated with stroke severity, which, in turn, can cause disability. If physical inactivity before stroke is associated with dependency in basic activities of daily living (ADL) unknown.

The aim was to evaluate whether physical inactivity before stroke influences ADL dependency 3 months after stroke.

Methods: A registry study with data from patients with acute stroke, admitted to Sahlgrenska University Hospital between the November 9, 2014, and June 30, 2019. Baseline data were collected from the three stroke units, and self-reported questionnaires for 3-month follow-up data. Self-reported physical inactivity before stroke was the primary independent variable (Saltin–Grimby Physical Activity Level Scale). ADL dependency was a composite measure of three tasks: mobility, dressing, and toilet use. Binary logistic regression was applied.

Results: Data from 3472 patients were analysed, median age was 75 years, 49% were physically inactive before stroke, and 75% had a mild stroke. 1/3 were ADL dependent at follow-up. Physically inactive patients, had 2.35 times higher odds for ADL dependency 3 months after stroke (odds ratio 2.35 [95% confidence interval (CI) 1.94–2.86]). The model correctly classified 84% of the patients (AUC [95% CI 0.82–0.85]). Older age, prior stroke, prior dependency and stroke severity also contributed.

Conclusions: Physical inactivity before stroke is associated with dependency in basic ADL 3 months after stroke. The findings of this study suggest that patients who are physically inactive before stroke are more likely to be dependent in basic ADL 3 months after stroke.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Patient-reported outcome measures after ICH: a prospective multicenter validation study

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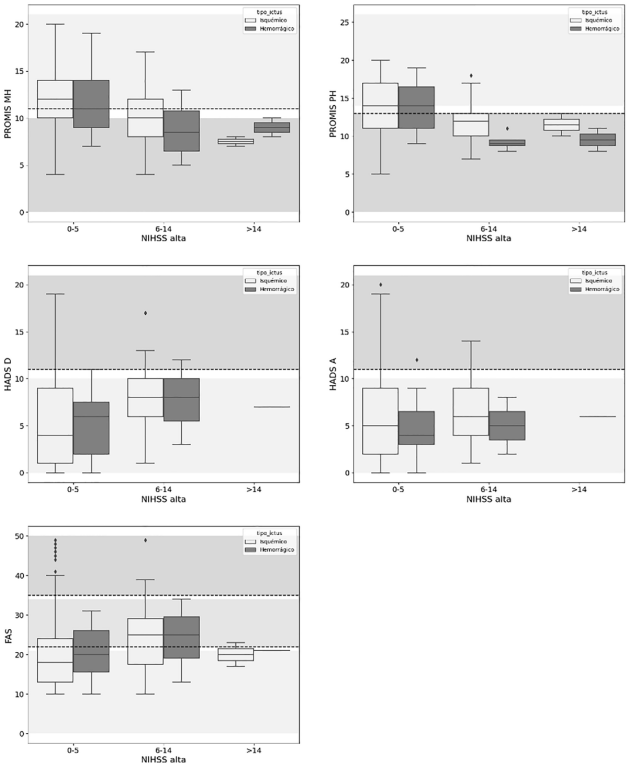
Background and aims: In Intracerebral hemorrhage (ICH) patients, long-term outcome is poorly evaluated by the modified Rankin Scale (mRS). Patient-reported outcomes (PROMs) are standardized metrics extensively validated in ischemic stroke patients (IS), that consider clinical outcomes from the patient-perspective. However, little is known about PROMS in ICH patients. Our aim was to describe PROMS in ICH patients and compare those with IS patients.

Methods: We evaluated consecutive stroke patients admitted in 5 academic hospitals that participated in HARMONICS (an EU-funded High-value Stroke care project in Catalonia) that implements a PROMs-through-App program (NORA, NoraHealth Barcelona Spain), from October 2021 to October 2022. We compared self-evaluated outcomes: the Hospital Anxiety and Depression Scale (HADS), the PROMIS-mental health, the PROMIS-physical health and the Fatigue Assessment Scale (FAS).

Results: Of a total of 2164 patients, 235 suffered an ICH. Demographics and risk factor profile were comparable among groups, except for more common HTA among ICH patients. At 3 months, rates of poor PROM-mental health (61 vs 43%, p= 0'1), PROM-physical health (56 vs 52%, p=0'26), HAD-anxiety (15 vs 15%, p=0'7), HAD-depression (13 vs 19%, p=0'6), FAS (40 vs 34%, p=0'7) were comparable between ICH and IS patients overall and subgroups according to baseline NIHSS and age. (graphic)

Conclusions: PROMs evaluation using a mobile-app-based communication system in ICH patients is reliable and doesn't show significant differences with IS patients. Further studies focused on the impact of PROMS in ICH warranted.



Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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ISCHEMIC AND HEMORRHAGIC STROKES IN YOUNG ADULTS: COMPARISON OF RISK FACTORS AND OUTCOMES

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Background and aims: Stroke in young adults accounts for only 15% of cases, but carries significant socioeconomic burden. Data regarding risk factors and functional outcomes for this population have been conflicting. We investigated differences in risk factors and outcomes for young adults with ischemic stroke (IS) and hemorrhagic stroke, specifically non-traumatic intracranial hemorrhage (ICH).

Methods: Young IS or ICH patients aged 18-50 years admitted to a comprehensive stroke centre from 2014-2021 were included. Baseline characteristics and outcome measures collected were modified Rankin Scale (mRS) on discharge and at 3-months, return to work (RTW) at 3-months and mortality.

Results: 459 patients were included with median time to follow-up of 15-months; 49.2% IS and 50.8% ICH, mean age 43±6 years, 71.5% male (n=328). Hyperlipidaemia, smoking and diabetes were more prevalent in IS than ICH (Table 1; 46.0% vs. 12.9%; 44.1% vs. 17.2%; 31.0% vs. 8.2%, respectively; p<0.001). ICH patients were more likely to have unfavourable shift in ordinal mRS on discharge (Figure 1; OR 7.5, CI 5.2-10.9, p<0.001) and 3-months (OR 6.4, CI 4.2-9.8, p<0.001), less likely to RTW at 3-months (36.3% vs. 54.4%, p=0.004), and higher mortality (12.0% vs. 2.5%, p<0.001). Although majority of IS patients (80.2%) had good functional outcomes (mRS≤2) at 3-months, only 54.4% RTW.

Conclusions: Young patients with IS have higher prevalence of modifiable atherosclerotic risk factors compared to young patients with ICH. Half of young stroke patients do not RTW at 3-months despite good functional outcomes. Further research is necessary to identify factors influencing RTW.

Disclosure of interest: No

Table 1. Baseline demographic and clinical characteristics according to cohort

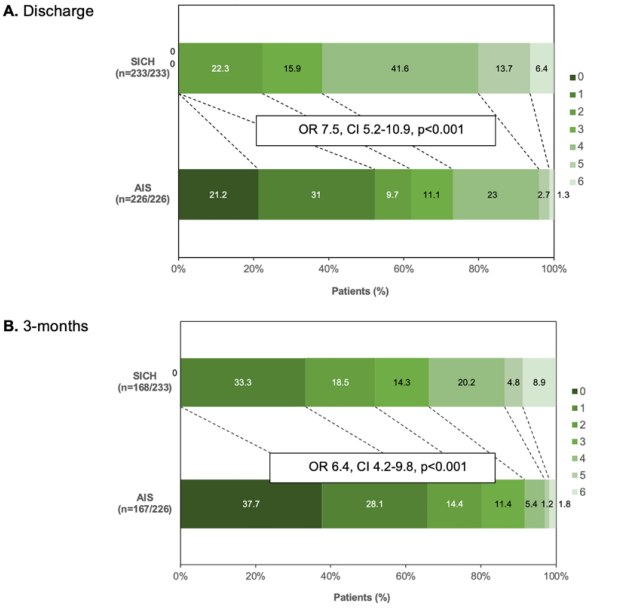
	All (n=459)*	IS (n=226)*	ICH (n=233)*	p value
Baseline Information				
Age, years (SD)	43.3 (5.7)	43.5 (5.5)	43.2 (5.9)	0.54
Male sex, %	328 (71.5)	158 (69.9)	170 (73.0)	0.47
Height (cm, SD)	164 (9.6)	163 (9.1)	165 (10.0)	0.062
Weight (kg, SD)	73.7 (18.0)	73.1 (17.4)	74.3 (18.7)	0.50
BMI (kg/m^2, SD)	27.3 (6.3)	27.3 (5.5)	27.2 (6.9)	0.81
Length of hospital stay, days	13.4 (17.2)	8.3 (9.0)	18.4 (21.4)	**<0.001**
Risk Factors				
Hypertension	254/459 (55.3)	130/226 (57.5)	124/233 (53.2)	0.40
Hyperlipidemia	134/459 (29.2)	104/226 (46.0)	30/233 (12.9)	**<0.001**
Smoking	118/410 (28.8)	78/177 (44.1)	40/233 (17.2)	**<0.001**
Diabetes	89/459 (19.4)	70/226 (31.0)	19/233 (8.2)	**<0.001**
Obesity	136/342 (39.8)	64/155 (41.3)	72/187 (38.5)	0.34
Prior IHD	29/459 (6.3)	24/226 (10.6)	5/233 (2.1)	**<0.001**
Prior stroke or TIA	32/459 (7.0)	22/226 (9.7)	10/233 (4.3)	**0.027**
History of AF	5/459 (1.1)	3/226 (1.3)	2/233 (0.9)	0.68
Outcomes				
Good functional outcomes on discharge	192/459 (41.8)	140/226 (61.9)	52/233 (22.3)	**<0.001**
Good functional outcome at 3-months	221/335 (66.0)	134/167 (80.2)	87/168 (51.8)	**<0.001**
Return to work at 3-months	117/260 (45.0)	68/125 (54.4)	49/135 (36.3)	**0.004**
Death	33/433 (7.6)	5/200 (2.5)	28/233 (12.0)	**<0.001**

IS, ischemic stroke; AF, atrial fibrillation; BMI, body mass index; IHD, ischemic heart disease; SD, standard deviation; ICH, intracerebral hemorrhage; TIA, transient ischemic attack.

Analyses performed using Pearson chi-square test (if expected values in all cells were more than 5), unless indicated.

*Represents total sample size. Data for certain variables not available in all patients, and have been indicated in table through the denominators.

Figure 1. Ordinal shift analyses for modified Rankin score on discharge and at 3-months



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SELF-PERCEIVED RECOVERY AND REMAINING DISABILITIES AFTER STROKE: STROKE IMPACT SCALE EVALUATION AT 3 MONTHS FOLLOW-UP

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Background and aims: With modern stroke care including thrombolysis and thrombectomy, recovery and remaining disabilities after ischemic stroke may have changed. We investigated patients' self-perceived health and daily life situation after stroke.

Methods: We included patients with acute ischemic stroke causing sensorimotor impairment from the local catchment area of Skåne University Hospital, Lund. At discharge from the acute hospital, the National Institutes of Health Stroke Scale (NIHSS) was examined. Participants were followed-up after three months with the Stroke Impact Scale (SIS)[1,2]. SIS includes eight domains; strength, memory/thinking, mood/emotions,

communication, daily activities, mobility, hand function, participation, and one question about recovery. The score for each domain is recalculated to a range 0-100%, where 100% means no remaining problems. We here report 3-months follow-up data for 68 patients.

Results: The participants' median age was 73 years, 57% were men, 16% had received thrombolysis, and 7% thrombectomy. At discharge from hospital, 93% had mild disability (NIHSS 0-4 points). At 3-months follow-up, participants reported most impact on mood/emotions and participation (SIS median scores 75% and 78%, respectively). Communication was least impacted (SIS median score 95%). Overall recovery median was 80% (Table 1).

Conclusions: People with acute ischemic stroke and initial sensorimotor impairment generally recover well after 3-months. Mood and emotions, as well as participation are more affected and important to follow up. Knowledge of remaining disabilities is essential for planning of future rehabilitation interventions.

[1] Duncan et al. Stroke. 1999;30:2131-2140.

[2] Duncan et al. Arch Phys Med Rehabil. 2003;84:950-963.

Table 1. Self-perceived impact on health and daily life and recovery according to the Stroke Impact Scale, SIS, 3 months after stroke onset

Domain 1 (strength in upper and lower extremities; n=68) Median (Q3-Q1)[1] %	81 (100-63)
Domain 2 (memory and thinking; n=68) Median (Q3-Q1) %	89 (100-75)
Domain 3 (mood, emotions; n=66)) Median (Q3-Q1) %	75 (92-63)
Domain 4 (communication; n=68) Median (Q3-Q1) %	95 (100-82)
Domain 5 (daily activities; n=68) Median (Q3-Q1) %	93 (100-80)
Domain 6 (mobility; n=68) Median (Q3-Q1) %	92 (100-76)
Domain 7 (hand function; n=68) Median (Q3-Q1) %	90 (100-75)
Domain 8 (participation; n=68) Median (Q3-Q1) %	78 (100-59)
Question 9 (recovery; n=68) Median (Q3-Q1)%	80 (91-66)

[1] Q3: Quartile 3, Q1: Quartile 1

Disclosure of interest: No

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ELEVATED SERUM SOLUBLE ST2 IS ASSOCIATED WITH POOR 1-YEAR OUTCOMES IN ACUTE ISCHEMIC STROKE

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Background and aims: Elevated soluble ST2 (sST2) has been a novel biomarker in cardiovascular and cerebrovascular diseases, with predictive value for poor outcomes. We aimed to investigate the associations between serum sST2 and poor 1-year outcomes in patients with acute ischemic stroke (AIS).

Methods: This was a prospective cohort study, enrolling AIS patients admitted within 24 hours of symptom onset. Serum sST2 level was obtained at admission. The primary outcome was a composite of major disability [modified Rankin Scale of 3-5] and death at 1 year. Secondary outcomes included major disability and death, analyzed separately, at 1 year. Logistic regression and restricted cubic spline analyses were used to examine the associations of serum sST2 levels at admission with the outcomes.

Results: Among 312 patients (median age 61 years, 28.5% females), 37 (11.9%) had a primary outcome, including 27 with major disability and 10 deaths. Elevated serum sST2 level at admission was significantly associated with the primary outcome [adjusted odds ratio (aOR) 1.58, 95% confidence interval (CI) 1.16-2.15; p=0.003] and major disability (aOR 1.53, 95% CI 1.09-2.16; p=0.014), and tended to be associated with mortality (aOR 1.65, 95% CI 0.98-2.76; p=0.059). Multivariate-adjusted restricted spline regression curves showed approximately linear relationships between serum sST2 levels and the risk of the primary outcome and secondary outcomes at 1 year ($p>0.05$ for nonlinearity).

Conclusions: Elevated serum sST2 in the acute stage could be as a promising predictor of poor outcomes at 1 year after an ischemic stroke.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Factors influencing recanalization after mechanical thrombectomy with first pass effect for acute ischemic stroke

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Background and aims: First pass effect (FPE) is increasingly recognized as a predictor of good outcome in large vessel occlusion (LVO). This study aimed to elucidate the factors influencing recanalization after mechanical thrombectomy (MT) with FPE in treating acute ischemic stroke (AIS).

Methods: Main databases were searched for relevant randomized controlled trials (RCTs) and observational studies reporting influencing factors of MT with FPE in AIS. Recanalization was assessed by the modified Thrombolysis in Cerebral Ischemia (mTICI) score. Successful (mTICI 2b-3) recanalization was observed. Risk of bias was assessed through different scales according to study design. I^2 statistic was used to evaluate the heterogeneity, while subgroup, meta-regression and sensitivity analysis were performed to investigate the source of heterogeneity.

Results: A total of 17 studies and 6186 patients were included. Among them, 2068 patient achieved recanalization with FPE. The results of meta-analyses showed that age (mean deviation (MD):1.21; p=0.012), female gender (odds ratio (OR):1.12,; p=0.046), diabetes mellitus (DM) (OR:1.17; p=0.032), occlusion of internal carotid artery (ICA) (OR:0.71; P=0.033), occlusion of M2 segment of middle cerebral artery (OR:1.36; p=0.019), duration of intervention (MD:-27.85; $p<0.001$), time of onset to recanalization (MD:-34.63; p=0.004), general anesthesia (OR:0.63; $p<0.001$) and use of balloon guide catheter (BGC) (OR:1.60; p=0.003) were significantly associated with successful recanalization with FPE.

Conclusions: Age, gender, occlusion site, anesthesia type and use of BGC were influencing factors for successful recanalization after first pass thrombectomy.

Disclosure of interest: No

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General anesthesia versus conscious sedation for endovascular therapy in acute ischemic stroke

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Background and aims: Endovascular thrombectomy (EVT) is the first-line treatment for patients with acute ischemic stroke (AIS). However, the optimal anesthetic modality during EVT is unclear. Therefore, this study is aimed to summarize the current literatures from RCTs to provide new clinical evidence of choosing anesthetic modality for AIS patients when receiving EVT.
Methods: Literature search was conducted in following databases, EMBASE, MEDLINE, Web of Science, and the Cochrane Library, for relevant randomized controlled trials (RCTs) comparing general anesthesia (GA) and conscious sedation (CS) for AIS patients during EVT. We used the Cochrane Collaboration criteria for assessment of risk bias of included studies. The heterogeneity of outcomes was assessed by I^2 statistic.
Results: 5 RCTs with 498 patients were included. GA was conducted in 251 patients and CS in 247 patients. EVT under GA in AIS patients had higher rates of successful recanalization (RR: 1.13, 95% CI: 1.04-1.23; $P = 0.004$; $I^2 = 40.6\%$) and functional independence at 3 months (RR: 1.28, 95% CI: 1.05-1.55; $P = 0.013$; $I^2 = 18.2\%$) than CS. However, GA was associated with higher risk of mean arterial pressure (MAP) drop (RR: 1.71, 95% CI: 1.19-2.47; $P < 0.01$; $I^2 = 80\%$) and pneumonia (RR: 2.32, 95% CI: 1.23-4.37; $P = 0.009$; $I^2 = 33.5\%$).
Conclusions: GA was superior over CS in successful recanalization and functional independence at 3 months when performing EVT in AIS patients. However, GA was associated with higher risk of MAP drop and pneumonia.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Predictors of in-hospital mortality after stroke at the Central Hospital of Maputo, Mozambique: a cross-sectional study

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Background and aims: Africa has some of the highest indices of stroke burden in the world. The increase in stroke burden is being driven by multiple factors acting across the lifespan. Stroke medicine has advanced, but substantial gaps remain in our understanding of stroke in Africa. The aim of this study was to identify predictors of in-hospital mortality in patients with acute stroke.
Methods: This was a single-center study of patients with acute stroke consecutively admitted to the Internal Medicine Department of a general hospital in Maputo during a six-months period. Data included variables related to sociodemographics, comorbidities, and medical complications, together with in-hospital mortality. Since mortality may impact differently by stroke subtype, sex and hospital length of stay, we proceeded to stratify by these variables.
Results: 149 patients were included. The hospital mortality rate was 24.2%. Stratifying by hospital stay (<7 and $\geqslant 7$ days), we observed that overall mortality was 15.9% versus 61.3% ($p < 0.0001$); by sex, we did not observe a worse result (p=0.546). And stratifying by stroke subtype, overall mortality in ischemic stroke was 18.7% versus 32.8% in cerebral hemorrhage (p=0.05). The main factors independently associated with hospital mortality were stroke severity (Glasgow Coma Scale < 9, odds ratio (OR): 3.2; 95%CI, 1.15-8.9), respiratory infections (OR: 4.7; 95%CI, 1.8-12.1) and intracranial hypertension (OR: 3.9; 95%CI, 1.6-10.1).
Conclusions: Stroke severity and potentially modifiable complications (respiratory infections) confer an increased risk of in-hospital death in both women and men, particularly during the second week of admission.
Disclosure of interest: No

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IMPACT OF RENAL FUNCTION VARIABILITY ON LONG-TERM PROGNOSIS IN ISCHEMIC STROKE PATIENTS WITH ATRIAL FIBRILLATION

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Background and aims: Although renal dysfunction is associated with poor clinical outcomes in patients with stroke and atrial fibrillation (AF), the impact of renal function variability on long-term prognosis remains unclear. We aimed to evaluate the associations of renal function variability with the risk of adverse clinical outcomes among transient ischemic attack (TIA)/ischemic stroke patients with AF.
Methods: Using a population-wide database in Hong Kong, we identified AF patients with acute ischemic stroke/TIA from 2016 – 2020. Renal function variability was assessed by calculating the coefficient of variation (CV) of the estimated glomerular filtration rates (eGFR) measured during follow up. Clinical endpoints included stroke, systemic embolism (SE), intracerebral hemorrhage (ICH) and extracranial bleeding, major adverse cardiovascular events (MACE), and all-cause mortality. Subdistribution hazard ratio (SHR) and hazard ratio (HR) were estimated by competing risk regression and Cox proportional hazards regression models.
Results: A total of 4,014 patients were included in the final analysis (mean age 80±11 years, 44% men). Greater eGFR variability was associated with a higher risk for stroke/SE (SHR: 1.08; 95% confidence interval: 1.01-1.16), ischemic stroke/SE (1.10;1.02-1.19), total bleeding (1.09; 1.02-1.16), MACE (1.24; 1.17-1.32), and all-cause mortality (HR:1.47; 1.42-1.52). In addition, greater eGFR variability was also significantly associated

with ICH (1.31; 1.14-1.51) in patients prescribed DOACs. In patients treated with warfarin, greater eGFR variability was only significantly associated with MACE (1.39; 1.19-1.62) and all cause-mortality (1.53; 1.36- 1.71).
Conclusions: Visit-to-visit renal function variability is independently associated with worse long-term clinical outcomes among AF patients with TIA/ischemic stroke.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Risk Factors for New Ischemic Cerebral Lesions after Carotid Artery Stenting

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Background and aims: New ischemic cerebral lesions (NICL) are commonly occur after carotid artery stenting (CAS) with an incidence rate ranging from 18 to 58% and are detected by diffusion-weighted imaging-magnetic resonance imaging (DWI-MRI). This study aimed to identify risk factors for NICL after CAS.
Methods: Relevant literature reporting risk factors for NICL after CAS were searched. Randomized controlled trials, case-control studies, or cohort studies were included in accordance with the pre-specified eligibility criteria. The risk of bias was assessed using the Cochrane Collaboration criteria and the quality of evidence was assessed with the corresponding scale.
Results: The final analyses included a total of 21 studies and 1,907 participants, including 764 NICL-positives and 1,143 NICL-negatives. Determinants for NICL-positivity were age (mean deviation (MD): 2.60; 95% confidence interval (CI): [1.53-3.68]), symptomatic carotid lesions (odds ratio (OR): 1.77; 95% CI: [1.39-2.25]) and smoking (OR: 0.74; 95% CI: [0.58-0.94]). For symptomatic patients, risk factors for NICL-positive included diabetes mellitus (OR: 1.76; 95% CI: [1.09-2.82]), but smoking (OR: 0.54; 95% CI: [0.31-0.93]) was a protective factor. Risk factors for centers with high NICL incidence were age (MD: 2.05; 95% CI: [0.93-3.17]) and symptomatic carotid lesions (OR: 1.77; 95% CI: [1.29-2.45]).
Conclusions: Older age and symptomatic carotid lesions are associated with an increased risk of post-CAS NICL whereas smoking is associated with a decreased risk. Risk factors for NICL in symptomatic patients is diabetes mellitus, while those for patients at centers with high incidence are age and symptomatic carotid lesions.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Antiplatelet vs. Anticoagulation in Cervical Artery Dissection

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Background and aims: The optimal management for cervical artery dissection (CAD) is uncertain. This study aimed to summarize the current randomized controlled trials (RCTs) to compare the efficacy and safety of antiplatelet and anticoagulation therapies for CAD.
Methods: A literature search was conducted in the major databases. Only the RCTs comparing the antiplatelet and anticoagulation therapies for the patients with CAD were included. Combined estimates of the relative risk (RR) of antiplatelet vs. anticoagulation were analyzed. Heterogeneity was measured using the I^2 statistical analysis. The analyses were performed in the intention-to-treat (ITT) and per-protocol (PP) population, respectively.
Results: Two RCTs involving 444 patients in the ITT population and 370 patients in the PP population were included. In the ITT population, compared with the patients in the anticoagulation group, the patients in the antiplatelet group showed a higher rate of ischemic stroke within 3 months (RR = 6.73, P = 0.029). No difference between these two treatment groups was found for the outcomes of transient ischemic attack (RR = 0.37, P = 0.181), intracranial hemorrhage (RR = 0.33, P = 0.494), major extracranial bleeding (RR = 0.31, P = 0.476), or the composite of these outcomes within 3 months. For the PP population, the results of the meta-analysis of outcomes between the antiplatelet and anticoagulation groups were consistent with the ITT population.
Conclusions: Compared with the antiplatelet group, the anticoagulation group has a lower risk of ischemic stroke without increasing bleeding risk when treating CAD.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Percutaneous transluminal angioplasty and stenting for vertebral artery stenosis

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Background and aims: To assess the safety and efficacy of percutaneous transluminal angioplasty, with or without stenting, combined with medical treatment (MT), compared to MT alone, in people with episodes of cerebral ischaemia due to vertebral artery stenosis (VAS).
Methods: We included all randomised controlled trials (RCTs) that compared endovascular treatment (ET) plus MT with MT alone in treating people aged 18 years or over with symptomatic VAS. We included all types of ET modalities. MT included risk factor control, antiplatelet therapy, lipid-lowering therapy.
Results: We included three RCTs with 349 participants with symptomatic VAS. There was no significant difference in 30-day post-randomisation deaths/strokes between ET plus MT and MT alone (risk ratio (RR) 2.33, 95% confidence interval (CI) 0.77 to 7.07). There were no significant difference between ET plus MT and MT alone in fatal/non-fatal strokes after 30 days post-randomisation to completion of follow-up (RR 0.51, 95% CI 0.26 to 1.01), ischaemic or haemorrhagic stroke during the entire follow-up period (RR 0.77, 95% CI 0.44 to 1.32), death during the entire follow-up period (RR 0.78, 95% CI 0.37 to 1.62), and stroke or transient ischaemic attack (TIA) during the entire follow-up period (RR 0.65, 95% CI 0.39 to 1.06).
Conclusions: This Cochrane Review provides low- to moderate-certainty evidence indicating that there are no significant differences in either short-or long-term risks of stroke, death, or TIA between people with symptomatic VAS treated with ET plus MT and those treated with MT alone.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Endovascular Therapy for Symptomatic Intracranial Artery Stenosis

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Background and aims: Intracranial artery atherosclerotic stenosis (ICAS) is one of the most common causes of stroke. Endovascular therapy including balloon angioplasty alone (BA), balloon-mounted stent (BMS), or self-expanding stent (SES) was an important alternative to treat symptomatic ICAS refractory to medical treatment, while none of the three subtypes has been established to be the primary option. We conducted this study to determine both the safety and efficacy and establish a hierarchy of different endovascular therapies on symptomatic ICAS.
Methods: Major databases were searched for studies comparing outcomes of three different endovascular approaches and other comparable non-endovascular therapies for symptomatic ICAS patients. Primary outcomes included short-term mortality or stroke rate (peri-procedural, or mean follow-up⩽3 months), and long-term mortality or stroke rate (mean follow-up⩾6 months). Pairwise and network meta-analyses based on the above systematic review were conducted.
Results: A total of 19 eligible studies involving 3386 patients treated with 4 different approaches (BA, SES, BMS, and medical treatment) were analyzed. For primary outcome, BA had the highest ranking (SUCRA value 78), followed by BMS (SUCRA value 21.5) and SES (SUCRA value 13.1). The short-term mortality or stroke rate was significantly lower in the BA group compared to SES (OR=2.50; 95% CI 1.12 to 5.57; p=0.026) or BMS (OR=0.43; 95% CI 0.19 to 0.96; p=0.038).
Conclusions: BA offers the highest level of safety outcomes in terms of short-term mortality or stroke in treating symptomatic patients with intracranial artery stenosis, compared to SES and BMS.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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PATTERNS OF HAEMORRHAGIC TRANSFORMATION AND FUNCTIONAL OUTCOME AFTER ACUTE ISCHAEMIC STROKE: RESULTS FROM THE ENCHANTED STUDY

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Background and aims: Haemorrhagic transformation (HT) may compromise functional recovery after thrombolysis for acute ischaemic stroke (AIS). We aimed to determine associations between patterns of HT (clinical and radiological categories) and functional outcome after AIS.
Methods: Data are from the international ENCHANTED study. Symptomatic intracerebral haemorrhage (sICH) was defined according to the Safe Implementation of Thrombolysis in Stroke-Monitoring Study (SITS-MOST) criteria, National Institutes of Neurological Diseases and Stroke (NINDS) criteria, and the European-Australian Cooperative Acute Stroke Study 2 (ECASS2) criteria. Asymptomatic intracerebral haemorrhage (aICH) was defined as any intracerebral haemorrhage but not classified as sICH. Radiological subtypes of HT were assessed by the Heidelberg Bleeding Classification: haemorrhagic infarction types 1 (HI1) and 2 (HI2), and parenchymal haematoma types 1 (PH1) and 2 (PH2). Logistic regression models were used to determine poor functional outcome defined as scores 3-6 on the modified Rankin scale at 90 days.
Results: Of 4370 included AIS patients, 779 (17.8%) developed any intracranial haemorrhage. sICH (odds ratio [OR] 22.26, 95%CI 8.70-56.96; p<0.001) and aICH (OR 2.18, 1.81-2.64; p<0.001) per SITS-MOST criteria were associated with poor functional outcome. Similar results were obtained for sICH and aICH per NINDS and ECASS2 criteria. HI1 (OR 2.40, 1.77-3.25; p<0.001), HI2 (OR 1.48, 1.05-2.09; p=0.027), PH1 (OR 2.45, 1.63-3.68; p<0.001) and PH2 (OR 5.05, 3.23-7.89; p<0.001) were associated with poor functional outcome.

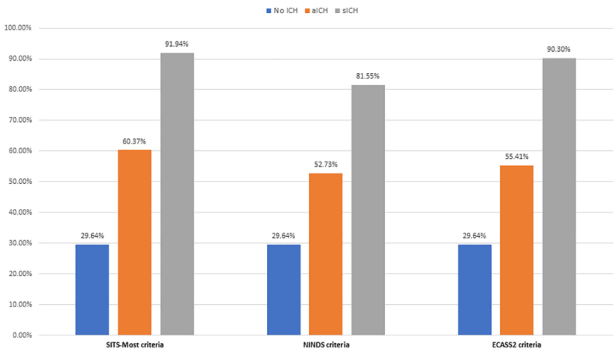

Figure 1. The percentage of poor functional outcomes (modified Rankin Scale 3-6) at 90 days based on different definitions of symptomatic intracerebral haemorrhage. ICH, Intracerebral haemorrhage; aICH, asymptomatic intracerebral haemorrhage; sICH, symptomatic intracerebral haemorrhage; SITS-MOST, the Safe Implementation of Thrombolysis in Stroke-Monitoring Study; NINDS, National Institutes of Neurological Diseases and Stroke; ECASS, the European-Australian Cooperative Acute Stroke Study.

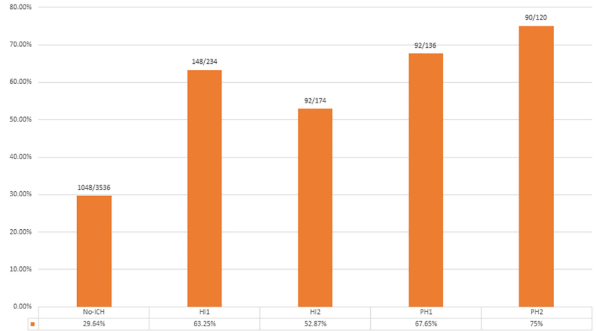

Figure2. The percentage of poor functional outcomes (modified Rankin Scale 3-6) at 90 days based on The Heidelberg Bleeding Classification. HI1, haemorrhagic infarction type 1; HI2, haemorrhagic infarction type 2; PH1, parenchymal haematoma type 1; PH2, parenchymal haematoma type 2.

Conclusions: All forms of ICH in relation to thrombolysis treatment for AIS predict poor functional outcome.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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High fibrin and platelet clot is associated with stroke recurrence after endovascular thrombectomy in patients with active cancer

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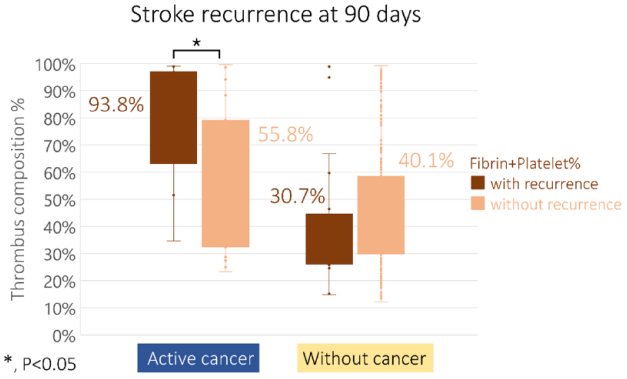
Background and aims: Fibrin and platelet-rich clot is characteristic of cancer related stroke. The correlation between clot composition and stroke recurrence in patients with active cancer is still unknown.
Methods: Acute ischemic stroke patients receiving endovascular thrombectomy between March 2015 and November 2021 were included, and were divided into active cancer, non-active cancer and without cancer groups. Clots underwent hematoxylin and eosin staining and the percentages of fibrin/platelet were quantified. Stroke recurrence was defined as newly developed neurological deficits 90 days from the index stroke event.
Results: A total of 420 patients with retrieved clots were included, which comprised of 50 patients with active cancer, 23 patients with non-active cancer and 347 patients without cancer. Higher rate of stroke recurrence and mortality at 90 days, as well as higher fibrin/platelet composition were observed in active cancer group compared to the other two groups (all P<0.001). The rate of stroke recurrence at 90 days was 38.9% with the median duration of 10 days after the index stroke in patients with active cancer. Furthermore, in patients with active cancer, fibrin/platelet percentage in retrieved clot was higher in those with stroke recurrence than those without (96.2% vs. 55.8%, P=0.011), while no such difference was observed in patients without cancer (**Figure**). After adjustment of clinical parameters, fibrin/platelet percentage was significantly associated with stroke recurrence in active cancer group [OR=1.06 (1.01-1.11), P=0.01].
Conclusions: Higher percentage of fibrin and platelet clot predicts stroke recurrence at 90 days among patients with active cancer after EVT.
Disclosure of interest: No



PROGNOSIS AND OUTCOME AFTER STROKE

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Susceptibility vessel sign, a predictor of long-term outcome in stroke patients treated with mechanical thrombectomy

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Background and aims: The absence of susceptibility vessel sign (SVS) in patients treated with mechanical thrombectomy (MT) is associated with poor clinical outcomes after three months. Underlying conditions, such as cancer, are assumed to influence the SVS status and could impact the long-term outcome. We aimed to assess the SVS status as an independent predictor of long-term outcomes in MT-patients.
Methods: SVS status was retrospectively determined in consecutive MT-patients at our stroke center between 2010 and 2018. Predictors of long-term mortality and poor functional outcome (modified Rankin Scale [mRS] ⩾ 3) were identified using multivariable cox and logistic regression, respectively.
Results: Out of the 558 patients included, SVS was absent in 13% (n=71) and present in 87% (n=487) on baseline imaging. Patients with absent SVS were more likely to have cancer (*P*=0.003) and diabetes mellitus (*P*<0.001) at the time of stroke. The median long-term follow-up time was 1058 days (interquartile range 533-1671 days). The absence of SVS was associated with long-term mortality (adjusted hazard ratio [aHR] 2.11, 95% CI 1.35-3.29, Figure 1) and poor functional outcome (adjusted odds ratio [aOR] 2.90, 95% CI 1.29-6.55, Figure 2). This was also the case for cancer (aHR 3.08, 95% CI 1.93-4.91, and aOR 3.97, 95% CI 1.53-10.28) and diabetes mellitus (aHR 1.78, 95% CI 1.19-2.64, aOR 2.85, 95% CI 1.39-5.85).
Conclusions: Patients with absence of SVS have a poorer long-term functional outcome. This could results from an underlying cancer, diabetes mellitus or other underlying conditions not identified yet.

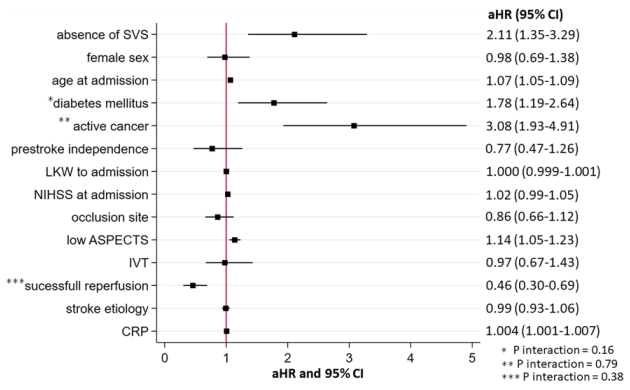

Figure 1.

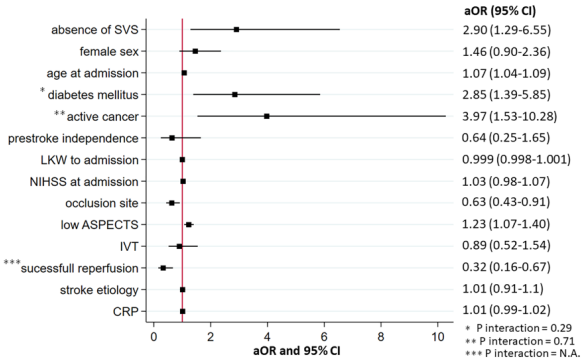

Figure 2.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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PULSATILITY INDEX AS A PROGNOSTIC MARKER OF COGNITIVE AND CLINICAL OUTCOME IN A COHORT OF PATIENTS WITH ACUTE NON-DISABLING STROKE AND TIA WITH DIFFERENT ETIOPATHOGENESIS

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Background and aims: to assess if cerebral hemodynamics represent a prognostic marker of clinical and cognitive outcome in acute Stroke/TIA patients

Methods: patients with TIA/minor stroke (MS) of anterior circulation were enrolled and clinical scales and cognitive tests were performed at: T1 (48-72h from onset), T2 (1 month follow up [FU]), T3 (6 months FU) and T4 (12 months FU). Vasomotor reactivity (VMR) and Pulsatility Index (PI) of MCA and PCA were registered at T1 and T3.

Results: 124 patients with acute MS/TIA were enrolled (median age 66 years, 71% men and 69,4% had a stroke). At T1, we found an inverse correlation between MCA PI and MMSE and MOCA and between PCA PI and MMSE and MOCA. A positive correlation was found between age and MCA PI and PCA PI, while an inverse correlation was registered between age and MMSE and MOCA. The same results were confirmed at T3. An inverse correlation was found between MCA PI at baseline and MOCA at T2, MMSE and MOCA at T3, MMSE and MOCA at T4. An inverse correlation was registered between baseline PCA PI and MMSE and MOCA at T2, MMSE and MOCA at T3, MOCA at T4. A positive correlation was observed between baseline MCA PI and mRS at T2, T3 and T4. VMR at T1 did not differ between stroke subtypes and was higher than T3.

Conclusions: MCA and PCA PI may play a key role in the acute phase of ischemic MS/TIA, predicting cognitive and clinical outcome.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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NEUROPSYCHOLOGICAL DEFICITS IN PATIENTS WITH FAVORABLE OUTCOME AFTER MIDDLE CEREBRAL ARTERY INFARCTION

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Background and aims: Functional outcome after stroke is measured by the modified Rankin Scale (mRS). Due to the right-left representation of neuropsychological functions in brain hemispheres, there might be a distortion between the classification of functional deficits on the mRS and the actual condition of patients. This study aimed to assess infarct volumes and neuropsychological symptoms in patients with left- and right-sided middle cerebral artery (MCA) infarction having a favourable mRS outcome at 3 months.

Methods: We included 105 patients with MCA infarction and mRS score 0-1 at 3 months. All patients received endovascular therapy during the acute phase due to proximal vessel occlusion. Infarct volumes were determined. Patients then received a follow-up examination via telephone interview and written questionnaires (SIS-16, SF-36). The 15 patients with largest infarct volumes were further assessed with neuropsychological test battery (TAP-M).

Results: Mean infarct volume was larger in patients with right-sided (23.3ml) compared to left-sided (8.5ml) MCA infarction ($p<0.05$). One in three patients with right-sided infarction stated to have permanently lost their work ability. Compared to age-dependent standard values, patients with right-sided infarction showed deficits in intrinsic and extrinsic alertness, divided and focused attention, whereas left-sided did not. Additionally, patients with right-sided infarction showed a subclinical neglect to the left.

Conclusions: The findings suggest the persistence of severe neuropsychological deficits and reduced quality of life in patients with right hemispheric stroke, although being categorized as "favourable functional outcome" on the mRS. The development of more sensitive outcome scales for neuropsychological dysfunction is urgently needed.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Prognosis reviewing by using geriatric nutritional risk index in acute ischemic stroke patients with intravenous thrombolysis

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Background and aims: To discuss the clinical characteristics in acute ischemic stroke (AIS) patients with intravenous thrombolysis under different nutritional status, and review the predictive value of geriatric nutritional risk index (GNRI) to prognosis.

Methods: The AIS patients with intravenous thrombolysis (n=311) hospitalized in neurology department of The Second Affiliated Hospital of Soochow University were retrospectively analyzed from Aug. 2018 to Aug. 2020. Patients with mRS$>$2 scores at discharge were considered as poor prognosis. With GNRI as nutritional screening tool, all patients were divided into high GNRI group (GNRI$>$98) and low GNRI group (GNRI$\leqslant$98).

Results: In univariate analysis, the high GNRI group was more likely to be older, and to have a history of atrial fibrillation and Coronary heart disease, the levels of hemoglobin, albumin, and glomerular filtration rate were lower, level of lactic dehydrogenase was high. The proportion of patients with poor prognosis in the malnutrition risk group was significantly higher than that in the non-malnutrition group.The results of multi-factor regression analysis showed that age, initial NIHSS score and atrial fibrillation were independent predictive factors of poor prognosis in AIS patients with intravenous thrombolysis. The ROC curve analysis showed that the predictive value of GNRI was high [AUC=0.826 (95%CI: 0.766-0.885, P<0.001)] .
Conclusions: Malnutrition is a risk factor for poor prognosis in acute ischemic stroke patients with intravenous thrombolysis. GNRI assessment of nutritional status is helpful to predict the prognosis of patients with acute ischemic stroke who are treated with intravenous thrombolysis.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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ASSOCIATION OF CHA2DS2-VASc WITH CARDIAC FUNCTION AND STROKE OUTCOME AFTER STROKE WITH ATRIAL FIBRILLATION

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Background and aims: Atrial fibrillation (AF) is associated with more grave outcomes than the other stroke subtypes. Left ventricular diastolic dysfunction (LVDD) is prevalent in the elderly people and is associated with AF risk. We investigated whether higher CHA_2DS_2-VASc score is associated with LVDD severity and stroke outcome in stroke with AF.
Methods: This is a retrospective analysis of prospectively collected data on consecutive AF-induced stroke patients <1 week from the onset with relevant MR imaging from March 2015 through February 2018. Patients were compared by median value (13.15) of LVDD. CHA_2DS_2-VASc was assessed by continuous variable, 3 strata (low-risk [a CHA_2DS_2-VASc score of 0–2], moderate-risk [3–4] and high-risk [5−9]), and its individual component. Stroke outcome was measured with modified Rankin Scale (mRS) at 3-month and poor outcome was defined as mRS ⩾3.
Results: A total of 177 patients (mean age, 74.1±9.83; male, 46.3%) were included. In multivariable analysis, CHA_2DS_2-VASc was independently associated with LVDD (OR 1.83, 95% CI: 1.37–2.45 for continuous model and 10.75, 2.90–39.75 for high-risk strata). Increasing CHA_2DS_2-VASc sore was associated with mRS ⩾3 (1.64, 1.17–2.31). Compared to the CHA_2DS_2-VASc 0–2, stepwise relationships were observed between increasing CHA_2DS_2-VASc strata and the risk of mRS ⩾3 (1.98, 0.51–7.71; 5.15, 1.16–22.89, respectively). Among individual components, diabetes (4.33, 1.31–14.27) and female sex (3.88, 1.17–12.85) remained as predictors of mRS ⩾3.
Conclusions: Higher CHA_2DS_2-VASc score might be a significant determinant of LVDD severity and 3-month functional outcome after stroke with AF.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Difference influence of renal hyperfiltration on short-term outcome in ischemic stroke patients according to the presence of reperfusion therapy

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Background and aims: Renal hyperfiltration (RHF) had poor short-term outcome after reperfusion therapy in ischemic stroke. However, impact of RHF on short-term outcome in ischemic stroke patients without reperfusion therapy was not revealed.
Methods: This cross-sectional study included 2,266 patients with reperfusion therapy and 1,977 patients without reperfusion therapy. A high and low eGFR were based on the Chronic Kidney Disease Epidemiology Collaboration equation and defined respectively as the 5th and 95th percentiles of age- and sex-specific eGFR. Occurrence of death within 6 months was compared between the groups according to their eGFR such as low, normal, or high eGFR.
Results: In patients with reperfusion therapy, 2,051 (90.5%) had a normal eGFR, 110 (4.9%) a low eGFR, and 105 (4.6%) a high eGFR. In patients without reperfusion therapy, 1770 (90.0%) had a normal eGFR, 102 (5.0%) a low eGFR, and 105 (5.0%) a high eGFR. Stroke severity and, the presence of large vessel occlusion were differed between two groups. After adjusting for variables with in the univariable analysis, 6-months mortality was independently associated with high eGFR (hazard ratio [HR] 2.22, 95% confidence interval [CI] 1.36–3.62, P=0.001) in patients with reperfusion therapy, but not in without reperfusion therapy (HR, 0.55, 95% CI, 0.22–1.39, P=0.207).
Conclusions: This finding suggested that the clinical impact of RHF could be stronger in the case of reperfusion. This finding may be contributed to the difference of stroke severity and the presence of large vessel occlusion.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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DEEP WHITE MATTER LESIONS INCREASE THE RISK OF STROKE RECURRENCE AT 90 DAYS

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Background and aims: The use of white matter lesions (WMLs) to predict poor prognosis in stroke patients has been previously reported, but the prognostic value of location and severity of WMLs on the prognosis of acute minor ischaemic stroke is unclear. The aim of this study was to investigate the impact of location (periventricular white matter, PVWM or deep white matter, DWM) and severity of WMLs on short-term recurrence of stroke.
Methods: A total of 2175 patients with acute minor ischaemic stroke with NIHSS <= 5 and presented to emergency room within 72 hours were prospectively included in the study. All patients enrolled had cranial MRI and CT completed. Baseline data and laboratory tests were collected. Trained radiologists evaluated the location and burden of WMLs by Fazekas scale. The primary outcome was stroke recurrence (ischaemic and haemorrhagic stroke) during 90-day follow-up. Multivariate Cox regression analysis assessed the relationship between WMLs and outcome.
Results: A total of 164 patients (8.5%) had a stroke recurrence. Overall presence of WMLs or PVWM did not significantly increase the risk of stroke recurrence. DWM with large confluent areas increased the risk of recurrence (HR 2.27, 95% CI 1.26-4.11 p=0.007). Increased Fazekas score may be associated with stroke recurrence (HR, 1.08, 95% CI 0.99-1.18).
Conclusions: Severity of DWM is associated with 90-day stroke recurrence in patients with minor stroke.
Disclosure of interest: No

Table 1. Relationship between WMLs and stroke recurrence

	n.total	n.event (%)	Crude HR 95%CI	P value	Adjusted HR 95%CI	P value
Presence of WMLs						
Without WMLs	446	27 (6.1)	1(Ref)		1(Ref)	
With WMLs	1509	137 (9.1)	1.48 (0.98~2.24)	0.063	1.25 (0.82~1.92)	0.302
PVWM						
absent	707	48 (6.8)	1(Ref)		1(Ref)	
"caps" or pencil-thin lining	736	64 (8.7)	1.25 (0.86~1.83)	0.238	1.16 (0.78~1.71)	0.466
smooth "halo"	459	43 (9.4)	1.42 (0.94~2.14)	0.097	1.31 (0.85~2.03)	0.216
irregular periventricular signal extending into the deep white matter	273	26 (9.5)	1.42 (0.88~2.29)	0.151	1.31 (0.79~2.2)	0.298
DWM						
absent	972	64 (6.6)	1(Ref)		1(Ref)	
punctate foci	696	67 (9.6)	1.49 (1.06~2.1)	0.022	1.4 (0.98~1.99)	0.064
beginning confluence	396	35 (8.8)	1.24 (0.81~1.88)	0.325	1.13 (0.72~1.78)	0.587
large confluent areas	111	15 (13.5)	2.17 (1.24~3.81)	0.007	2.27 (1.26~4.11)	0.007
Fazekas score, continuous	2175	181 (8.3)	1.09 (1.01~1.18)	0.029	1.08 (0.99~1.18)	0.076

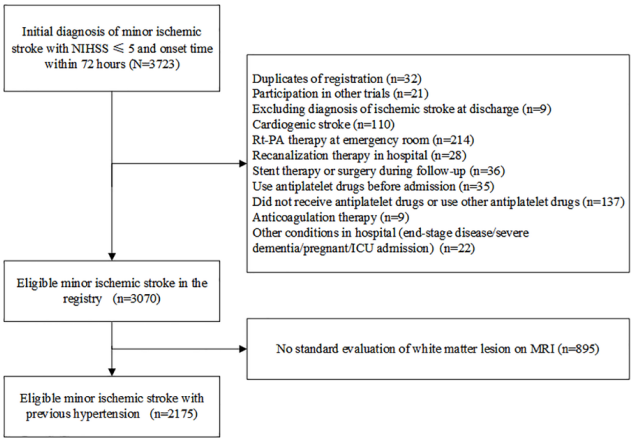

Figure 1. Flowchart of the study.

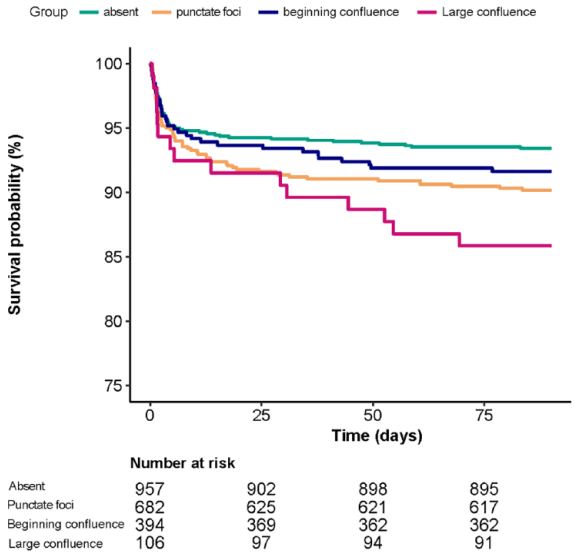

Figure 2. K-M curve of stroke recurrence among DWM groups.

PROGNOSIS AND OUTCOME AFTER STROKE

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Blood viscosity Associated with Stroke Mechanism and Early Neurological Deterioration in Middle Cerebral Artery Atherosclerosis

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Background and aims: Ischemic stroke with middle cerebral artery (MCA) atherosclerosis is caused by various mechanisms. Blood viscosity may affect stroke mechanism and early neurological deterioration. Here, we aimed to investigate the relationship between blood viscosity stroke mechanism and END in patients with MCA infarction.

Methods: We recruited consecutive patients with symptomatic MCA atherosclerosis (⩾50% stenosis). Blood viscosity (systolic and diastolic) was measured by scanning capillary-tube viscometer. These parameters were compared among patients with different mechanisms of symptomatic MCA disease (in situ thrombo-occlusion, artery-to-artery embolism, and local branch occlusion). END was defined as four points increase in the National Institutes of Health Stroke Scale (NIHSS) score from baseline during the first week. Associations between blood viscosity and END were evaluated.

Results: A total of 360 patients (76 in situ thrombo-occlusion, 216 artery-to-artery embolism, and 68 local branch occlusion) were investigated. Blood viscosity (systolic and diastolic) were highest in stroke due to in situ thrombo-occlusion, followed by artery-to-artery embolism, and local branch occlusion (p <0.001). Blood viscosity, initial NIHSS, and stroke caused by in situ thrombo-occlusion were independently associated with END in patients with MCA disease. In subgroups, diastolic blood viscosity was independently associated with END in patients with sMCA-IST (adjusted OR, 1.338; 95% CI, 1.010–1.771), sMCA-AAE (adjusted OR, 1.285; 95% CI, 1.010–1.634), and sMCA-LBO (adjusted OR, 1.524; 95% CI, 1.035–2.246).

Conclusions: Stroke caused by in situ thrombo-occlusion had highest blood viscosity. Blood viscosity was related to END in patients with stroke caused by MCA disease.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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BRAIN FRAILTY MEDIATES DISCREPANCIES BETWEEN FIV AND 90-DAY FUNCTIONAL OUTCOME IN PATIENTS WITH ISCHEMIC STROKE RECEIVING ENDOVASCULAR TREATMENT: A STRUCTURAL-EQUATION-MODELLING APPROACH

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Background and aims: Some patients have poor outcome despite small final infarct volume (FIV) after receiving endovascular treatment (EVT), while others with large FIV do better. We investigate the extent to which such discrepancies are mediated by imaging-determined brain-frailty.

Methods: This is a post-hoc analysis of the ESCAPE-NA1-trial in patients undergoing EVT. Brain-frailty, scored on non-contrast CT(NCCT), was defined by subcortical atrophy(cc-it ratio), cortical atrophy(GCA score), lacunes, chronic-infarctions and white-matter-disease(Fazekas). FIV was delineated on diffusion-weighted-magnetic-resonance-imaging(DWI-MRI) or 24h-NCCT. A structural-equation-model was applied to create a latent-variable([LV]="imaging-brain-frailty"). This LV was then included as possible mediator for the association between low/high-FIV(⩽7 mL/⩾92mL) and poor/good 90-day-outcome(mRS⩾3/mRS⩽2) respectively. Adjustments were made for age, vascular risk factors, pre-existing cancer, and serious-adverse-events(SAE)–variables previously shown to

be associated with FIV-mRS-discrepancies. Marginal contributions for each observed variable in the model were calculated.

Results: We included 1085/1105 patients; the median age was 71(IQR61-80), median ASPECTS 8(IQR7-9) and median baseline-NIHSS 17(IQR12-21). Brain-frailty mediated the relationship between small-FIV and 90-day-mRS3-5(ß-coefficient for the indirect pathway=0.02[95%CI=0.0002-0.03]), with subcortical atrophy as the main contributor (>30%pseudo-R-Squared), figure-1. However, brain-frailty did not significantly mediate the relationship between a large-FIV and 90-day-mRS0-2(ß=-0.005; 95%CI=-0.01; 0.004).

Conclusions: Imaging markers of brain-frailty significantly mediate discrepancies between FIV and 90-day-outcome only as it relates to patients ending up with a poor 90-day outcome despite a small FIV, with subcortical atrophy being the largest contributor. Studies examining EVT outcomes should account for differences in brain-frailty burden.

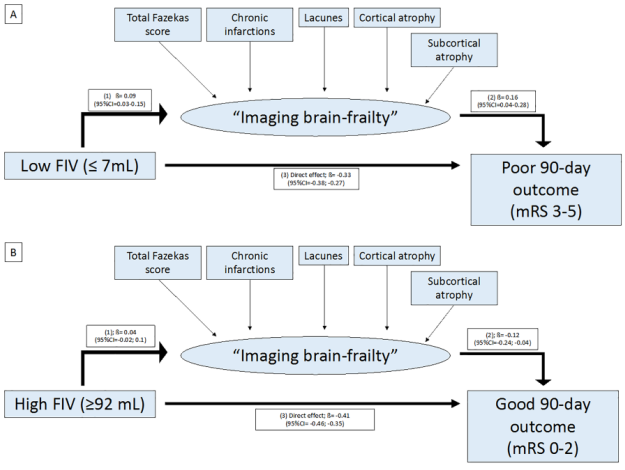

Figure 1. Causal pathway model.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

1411

Brush Sign is associated with better functional outcomes at 3 months in patients with ischemic stroke after mechanical thrombectomy

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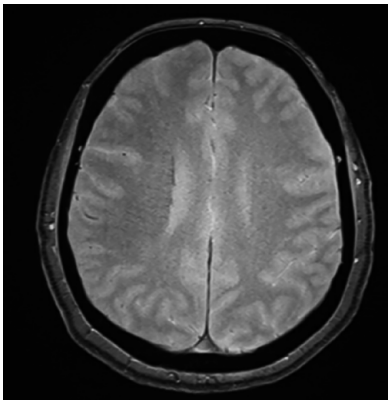
Background and aims: The Brush Sign (BS) is a radiological biomarker (MRI) showing subependymal and deep medullary veins and visible in paramagnetic-sensitive magnetic resonance sequences. It seems appear in proximal arterial occlusion of the anterior circulation. We aimed to assess BS on T2*-weighted sequences in prediction of functional prognosis in patients treated with mechanical thrombectomy (MT).

Methods: We included all consecutive patients with large artery occlusion (LAO) related stroke treated with MT between February 2020 and October 2022 at Reims University Hospital. Multivariable logistic regression models were used to investigate factors associated with BS and its impact on outcomes.

Results: Of the 244 included patients, 87 (35,6 %) had a BS on baseline MRI. Mean age was 72 ± 16 years and 52,5% (n=128) were female. In univariate analysis, patients with BS were more likely to be younger (68 vs 74; *p*=0.007), to have a higher NIHSS score (*p*=0.038), to have a proximal occlusion (p=0.012). In multivariate analyses, BS was associated with a younger age (OR: 0.977 (0,958 – 0,997)) and the presence of cortical veins signs (OR: 6.450 (3,428 – 12,137)). Regarding outcomes, the presence of a BS was independently associated with good outcomes (OR 2.186 (1,036 – 4,614) at 3 months but not with mortality nor with symptomatic ICH.

Conclusions: BS may represent a predictive factor of favorable evolution LAO related stroke after MT and might participate in the therapeutic decision. BS could be considered as a biomarker of physiological adaptation to cerebral ischemia, allowing prolonged viability of brain tissue.



Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

1514

Optical Coherence Tomography to Determine Thrombus as a Pathological factor of Intracranial Atherosclerotic Stenosis

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Background and aims: Thrombosis has been recognized as a factor in the development of atherosclerosis and a cause of heart attack and stroke. However, the frequency and clinical associations of thrombosis in intracranial atherosclerotic stenosis (ICAS) remains unclear. The purpose of this study was to determine the prevalence, characteristics and clinical significance of thrombosis in patients ICAS using optical coherence tomography (OCT).

Methods: A prospective study (NCT05550077) was conducted in 135 patients with intracranial arterial stenosis who underwent pre-intervention OCT. The enrolled patients were classified according to the presence of *in situ* thrombus defined by OCT. Clinical data, OCT characteristics and post-interventional outcome were compared between two groups.
Results: 82 patients were diagnosed as ICAS and finally enrolled. In situ thrombus was identified in 34 patients (41.5%). Patients with atherosclerotic thrombus are prone to have cerebral infarctions rather than TIA (44.1% vs 29.2%, *P*=0.022). Perioperative cerebral infarction (73.5% vs 43.8%, *P*=0.013) and in-stent restenosis (67.7% vs 39.6%, *P*=0.015) was more frequently to be observed in patients with thrombus.
Conclusions: This study achieved *in vivo* analysis of ICAS and revealed high incidence of *in situ* thrombosis for the first time. In addition, the *in situ* thrombus has significant influence on clinical events and outcomes of ICAS. Interventional treatment may produce additional cerebral infarction and higher incidence of in-stent restenosis in ICAS patients with *in situ* thrombus. However, anticoagulation therapy may provide an alternative strategy in ICAS when thrombus was detected *in vivo*.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

1522

Using artificial intelligence to predict the in-hospital mortality of malignant middle cerebral artery infarction patients receiving decompressive hemicraniectomy

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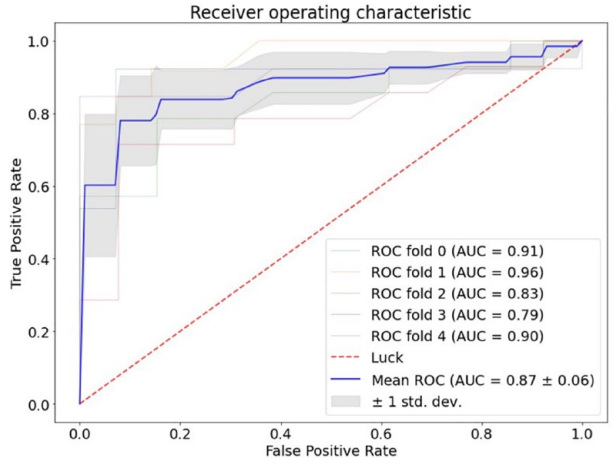
Background and aims: Malignant middle cerebral artery infarction (MMI) is a devastating complication that is usually observed in ischemic stroke patients with a large middle cerebral artery infarction. Though decompressive hemicraniectomy has been suggested as a lifesaving procedure, there are currently no practical tools to predict in-hospital mortality in MMI patients receiving decompressive hemicraniectomy. We aim to use machine learning and deep learning algorithms to construct models for predicting the in-hospital mortality of these patients.
Methods: A clinical dataset including consecutive 433 middle cerebral artery infarction patients
was assessed and 89 of them who fit the study criteria were further selected for machine and deep learning algorithms including XGBoost, Logistic Regression, Decision Tree, Random Forest, and Deep Neural Networks to construct predictive models. We then used metrics including accuracy, precision, recall, F1 score, and area under curve (AUC) to assess the performance of each model.
Results: Among all the applied machine learning and deep learning algorithms, Random Forest generated the best predictive model. The predictive model could achieve an average accuracy of 0.851, recall of 0.853, precision of 0.866, F1 score of 0.854, and AUC of 0.878. From every aspect, the predictive model could be considered good to excellent since all the indicators required were above 0.85.
Conclusions: In this study, we used machine learning algorithms to construct a successful model for the prediction of in-hospital mortality in MMI patients receiving decompressive hemicraniectomy, which could be clinically practical and further contribute to decision-making in the management of these critically-ill patients.
Disclosure of interest: No



PROGNOSIS AND OUTCOME AFTER STROKE

1551

DNA-Methylation and Stroke Prognosis: A EWAS Metanalysis

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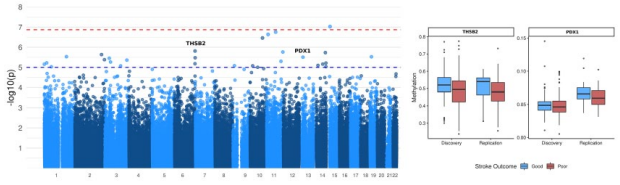
Background and aims: Stroke is the leading cause of adult disability. Although we know most of the clinical factors associated with stroke outcome, there is a significant variability between individuals that may be explained by genetics, including DNA methylation (DNAm). We aimed to study the association between DNAm and stroke prognosis.
Methods: We conducted a discovery study in patients with ischemic stroke (n=316) followed by a replication stage in an independent cohort (n=92), and a meta-analysis. We defined poor stroke outcome as a modified Rankin scale at 3 months higher than 2. DNAm was determined with the 450K and EPIC BeadChip in whole-blood samples (first 24 hours). After quality controls, we searched differentially methylated positions (DMPs) in 370,344 CpGs. Meta-analyzed DMP results were used to find differentially methylated regions (DMRs).
Results: In the discovery stage, we identified 29 CpGs nominally associated with stroke outcome (p-value $< 10^{-5}$), and two of them were replicated (Q-value < 0.05): one annotated to THBS2 gene (meta-analysis p-value=$6.45 \cdot 10^{-9}$) and the other to PDX1 gene (meta-analysis p-value=$4.46 \cdot 10^{-7}$). The meta-analysis of both cohorts revealed 10 nominally significant DMPs (p-value$<1 \cdot 10^{-5}$), two of which annotated to THBS2 gene. We subsequently identified 4 DMRs in patients with poor outcome, annotated to ZFP57, ALOX12, ABI3 and ALLC genes (p-value$<1 \cdot 10^{-9}$ in all cases).



Conclusions: Patients with poor outcome showed a differential methylation signal at THBS2 and PDX1 genes, which are involved in angiogenesis and glucose metabolism, respectively. Furthermore, the regions analysis revealed 4 DMRs annotated to genes related to atherogenesis and dementia.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

1643

WHITE MATTER HYPERINTENSITIES, ISCHEMIC PENUMBRA AND FUNCTIONAL OUTCOME IN PATIENTS WITH LARGE VESSEL OCCLUSION TREATED WITH THROMBECTOMY

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Background and aims: White matter hyperintensities (WMH) may affect functional outcome following mechanical thrombectomy (MT) in patients with acute ischemic stroke due to large vessel occlusion (AIS-LVO). We aimed to clarify this association and to explore potential underlying mechanisms.
Methods: We analysed data from patients with AIS-LVO treated with MT within 6 hours after symptom onset who achieved successful reperfusion included in the prospective FRAME study. WMH volume, infarct core volume and the mismatch (MM) ratio were measured on baseline MRI using automated quantitative methods. Haemorrhagic transformation (HT) was evaluated on 24-hours post-treatment imaging according to the ECASS I criteria. Poor functional outcome was defined as a modified Rankin scale >2 at 3 months. Multivariable logistic regression models were used to assess the association of WMH volume with functional outcome. We also evaluated the associations of WMH volume with baseline MM profile (MM ratio $\geqslant 1.2$ and MM volume >10 mL) and post-treatment HT.
Results: We enrolled 163 patients (median age 74.3 years; IQR 64.5 - 82.4), of whom 96 (59%) had a favorable clinical outcome. In multivariable analyses, increased WMH volume was independently associated with poor functional outcome (adjusted OR 1.57, 95% CI 1.05-2.58). We did not find any significant association between WMH volume and baseline MM profile or post-treatment HT.
Conclusions: In patients with AIS-LVO who achieved reperfusion, increased burden of WMH is associated with poor functional outcome. This association does not appear to be mediated by decreased ischemic penumbra or increased risk of HT.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Natural history of adverse non-motor outcomes after stroke: comprehensive systematic review and meta-analysis

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Background and aims: Large-scale data on the natural history of post-stroke adverse non-motor outcomes (anxiety, depression, fatigue, sleep disturbance, social participation, pain, bowel function, bladder function, and sexual dysfunction) after stroke are needed but current evidence is limited. In this comprehensive systematic review and meta-analysis, we investigated how the prevalence of adverse non-motor outcomes changes with time after stroke.
Methods: From PubMed, Embase, Medline via PubMed, and PsycINFO searches we identified observational, case-control, and prospective

studies published between January 1999, and December 2020. Data on the prevalence of adverse non-motor outcomes at different time points post stroke were pooled in a random effects meta-analysis. The time trends in prevalence for each post-stroke adverse non-motor outcome were assessed with adjusted meta-regression analysis.
Results: We identified 7,905 articles, of which 254 studies describing 105,358 adults with a follow up time point between 1 months to 10 years post stroke were included. We found no significant reduction in prevalence for anxiety (coefficient 0.015, p=0.341), sleep disturbance (coefficient 0.0020, p=0.377), social participation (coefficient 0.018, p= 0.486), depression (coefficient -0.013, p= 0.351), fatigue (coefficient -0.015, p=0.385), bowel function (coefficient= -0.017, p= 0.516) and bladder function (coefficient -0.024, p=0.516). But significantly reduced prevalence only for pain (coefficient -0.047, p= 0.052), and sexual dysfunction (coefficient -0.11, $p<0.0001$) was identified.
Conclusions: The prevalence of adverse non-motor outcomes after stroke remains high in 7 of 9 health domains between 1 months to 10 years after stroke. These findings suggest a persisting unmet clinical need for many years after stroke.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

1741

Usefulness of Geriatric Nutritional Risk Index (GNRI) as a Predictor of Outcome in Elderly Stroke Patients

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Background and aims: Nutritional status is known to be an outcome predictor in elderly stroke patients. However, even in patients with good nutritional status at onset, there are cases in which the outcome is poor due to the severity of stroke and recurrence or exacerbation after hospitalisation. Here we examined how GNRI changes and how it relates to outcomes.
Methods: We retrospectively reviewed 119 patients aged 65 years or older who were admitted to our hospital with acute stroke and were discharged via rehabilitation ward (Rehab).
Results: GNRIs at admission, transfer to Rehab, and discharge were 99.8 $\pm$ 9.7, 89.5 $\pm$ 10.6, and 90.6 $\pm$ 9.6, respectively. The no risk group, which accounted for 58% at admission, decreased to 17% at Rehab transfer, while the severe risk group, which was only 4% at admission, increased significantly to 26% at Rehab transfer. The total functional independent measure score (FIM/T) at discharge for each of the no, mild, moderate, and severe risk groups at Rehab transfer was 104.3 $\pm$ 18.4, 101.8 $\pm$ 31.4, 69.5 $\pm$ 34.6, and 58.1 $\pm$ 35.8, respectively. FIM/T was significantly lower in the moderate and severe risk groups than in the no and mild risk groups ($p < 0.001$). The rates of home discharge in each GNRI risk group at the Rehab transfer were 77.8%, 76.0%, 47.4%, and 39.3% in the no, mild, moderate, and severe risk groups, respectively ($p = 0.006$).
Conclusions: GNRI at Rehab transfer is useful as an outcome predictor for elderly stroke patients.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

1772

Outcome of reperfusion therapy for patients with both acute ischemic stroke and active cancer

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Background and aims: The benefit of recanalization therapy for acute ischemic stroke in patients with active cancer remains unknown. We investigated the prevalence of active cancer in stroke patients and examined indications and outcomes of intravenous thrombolysis (IVT) and mechanical thrombectomy (MT) for such patients.
Methods: Using a prospective multicenter stroke registry in Osaka, Japan, we identified patients with ischemic stroke who were admitted within 4.5 hours after symptom onset between April 2020 and September 2022. Patients were classified by the presence of active cancer, and rates and outcomes of IVT and MT were compared between those with and without active cancer. Outcomes were assessed by modified Rankin Scale (mRS) scores at discharge.
Results: Among 1402 enrolled patients with ischemic stroke, 311 (38% women, median age 77 years) were eligible for analysis. The median NIHSS score was 5. Eighty-two patients received IVT, and 70 received MT. Active cancer was present in 43 (14%), and 79% of them had distant metastasis. Patients with active cancer were less likely to receive IVT than those without cancer (12% vs. 29%, P=0.02), but cancer-status did not influence MT (28% vs. 22%, P=0.37). Although outcomes at discharge were worse in patients with active cancer (P=0.001), when restricted to patients receiving IVT or MT, outcomes did not differ between the groups.
Conclusions: Ischemic stroke patients with active cancer were less likely to receive IVT, but equally received MT. For patients who were able to undergo IVT or MT, outcomes were comparable regardless of cancer status.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

1782

FUNCTIONAL OUTCOMES IN PATIENTS WITH LARGE VESSEL OCCLUSION ANTERIOR CIRCULATION STROKES PRESENTING WITH LOW NIHSS SCORE WITH OR WITHOUT THROMBECTOMY TREATMENT

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[1]Western University of Health Sciences, College of Osteopathic Medicine of the Pacific Northwest, Lebanon, United States, [2]Providence Brain and Spine Institute, Providence Health and Services, Portland, United States

Background and aims: AHA/ASA stroke guidelines updated in 2019 recommend thrombectomy for patients with anterior circulation LVO presenting with NIHSS ³6. However, patients with NIHSS <6 may receive thrombectomy at their physician's discretion. Minimal published data evaluates efficacy and safety of thrombectomy in these patients. This study aims to describe outcomes in this population.
Methods: Data from patients discharged between October 2017-August 2022 with LVO and LKW £6 hours were abstracted from electronic medical records. Patients <18 with posterior circulation stroke or arrival NIHSS >5 were excluded. Patients were grouped by thrombectomy treatment. Outcomes were reperfusion scores (TICI), hemorrhagic complications, 90-day mRS, and discharge disposition. Analyses were performed using Chi-squared test, Fisher's exact test, or median test.
Results: 72 patients met inclusion criteria. 9 (12.5%) received thrombectomy and 63 (87.5%) did not. 38 patients had mRS scores documented at 90-days. Thrombectomy patients had worse median arrival NIHSS scores (4.00 [1.00,4.00] vs. 2.00 [1.00,3.00]). Racial and ethnic minorities did not receive thrombectomies (0, (0%) vs. 9 (100%)). All thrombectomy patients had TICI scores of ³2b. Hemorrhagic complications were found in both groups; treatment (1,11.1%) and non-treatment (3, 4.8%). No

patients required rescue thrombectomy. Two patients in the non-treatment group discharged to hospice. However, the median 90-day mRS was the same for the treatment (n=6, 1.00 [1.00, 1.50]) and non-treatment groups (n=33, 1.00 [1.00, 2.00]). No differences were found for comorbidities, pre-stroke mRS, and sex.
Conclusions: Patients with LVO and low arrival NIHSS had good clinical outcomes regardless of thrombectomy treatment.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

1823

Medial Medullary Infarction: Clinical Features and Follow-up Study

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Background and aims: Medial medullary infarction(MMI) is a rare type of posterior circulation stroke. We studied clinical, radiological and prognostic data of patients with MMI admitted to our stroke unit.
Methods: Medullary lesions were rostro-caudally classified as rostral, middle and caudal, and ventro-dorsally as ventral, middle and dorsal according to the method used by Kim and Han. Functional outcome was assessed with the modified Rankin Scale (mRS) on admission and at discharge. mRS between 0-2 was considered as good, mRS 3-5 as poor outcome.
Results: Forty-eight patients admitted between 1997-2022, [mean age 62,4 years (±13,1), 34 male] were evaluated. Median follow-up duration was 20 months (1-60). The most common risk factor was hypertension (%81) and 27% of the patients had history of previous stroke. Large vessel disease (LVD) was the most frequent cause seen in 57% of patients. Almost 1/3rd of the patients deteriorated in the first 48 hours. The most frequent infarct localization was rostral medullary region (30 patients) and caudal infarction was seen in 4 patients. In ventro-dorsal classification, ventral region was the most affected region, followed by the ventral-dorsal area. Two-thirds of the patients had poor outcome at discharge. Nine patients died during follow-up; 2 during hospital stay and 3 in the 3 months following discharge, only 2 patients had recurrent ischemic stroke at long-term follow-up.
Conclusions: MMI is a rare disease with unfavorable outcome. Considering that LVD was the most frequent underlying etiology, stroke recurrence(5%) was low in survivors of the index episode at long-term follow-up.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

1907

STROKE COLLATERALS: QUANTIFYING FLOW CHARACTERISTICS IN CORTICAL MICROVASCULAR NETWORKS WITH VARYING PENETRATING TREE DENSITIES

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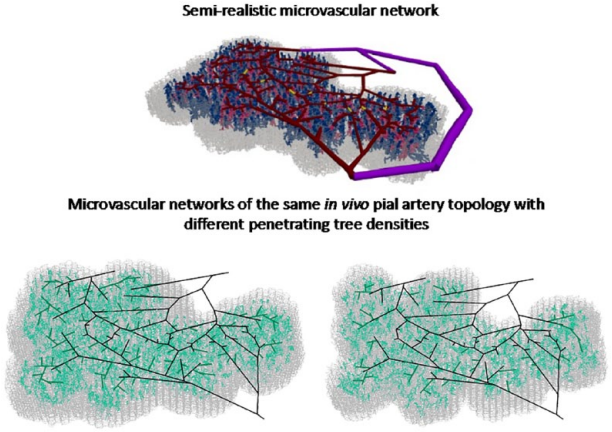
Background and aims: Leptomeningeal collaterals (LMCs) maintain perfusion to the ischaemic core region. However, the extent of LMCs varies across individuals, and their effect on blood flow redistribution during middle cerebral artery occlusion (MCAo) and reperfusion remains unclear. As collateralisation differs between mouse strains, *in vivo* studies in mice are well-suited to advance our fundamental understanding. Yet, the increased number of LMCs in mice goes hand in hand with a higher density of penetrating trees, i.e., vessels that connect pial vessels with capillaries. To quantify observations from mice with varying LMC densities, in-depth knowledge about the impact of these topological characteristics is crucial.
Methods: Computational models are powerful tools enabling studies of the isolated impact of specific parameters. Building on an existing *in silico* framework, we quantify how high and low penetrating tree densities affect flow characteristics in 10 semi-realistic networks derived from one *in vivo* pial artery topology of C57BL/6 mice with constant LMC status.
Results: The total inflow of the microvascular network increased for higher penetrating tree densities. Flow characteristics differed most at the capillary level. Both pressure drop and red blood cell velocity in the capillary bed tended to be higher for networks with lower penetrating tree density.
Conclusions: These characteristics are relevant for oxygen discharge and likelihood of capillary stalls and might contribute to differences in stroke outcomes between individuals with rich and poor collaterals. Our results show that penetrating tree density affects perfusion characteristics in collateral networks, and should therefore be considered when modelling stroke.



Microvascular networks of the same *in vivo* pial artery topology with different penetrating tree densities

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

1921

Risk factors for early mortality after endovascular stroke therapy

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Background and aims: Endovascular stroke therapy (EVT) improves functional outcome and reduces mortality in patients with large vessel occlusion. However, data on risk factors for early mortality after EVT are scarce. We aimed to investigate the effect of clinical factors, available at the time of stroke unit admission, on early (⩽7 days post-stroke) mortality following EVT.
Methods: We analyzed data from the nationwide Austrian Stroke Unit Registry (ASUR) covering consecutive stroke patients that had received EVT between 2013 and 2020. We used multivariable regularized regression analyses to identify factors associated with early mortality. We further tested the accuracy of a modified version of the "Predicting Early Mortality of Ischemic Stroke" (mPREMISE) score.
Results: 3710 patients (median age: 74.3 years, 52% female) had received EVT, of whom 253 (6.8%) died within 7 days after admission. Hierarchically, stroke severity at admission, higher age, incomplete recanalization (Thrombolysis in Cerebral Infarction scores ⩽2a), vertebrobasilar occlusion, chronic heart disease, pre-stroke disability (modified Rankin Scale >1) and diabetes mellitus were independently related to early mortality. The area under the receiver operating curve for the mPREMISE score was 0.73 (95% CI, 0.70-0.77). Patients with a score ⩾9 held a 52% (95% CI, 48%–56%) risk to die within the first days after EVT.
Conclusions: In this nationwide analysis, we identified easily assessable risk factors for early mortality after EVT. In this context, the mPREMISE score seems to be a particularly reasonable tool.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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The complex ways stroke survivors are supported beyond formal care in South London: A qualitative study

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Background and aims: As one of the leading causes of disability and death in the world (World Health Organisation, 2020), the financial and economic implications of stroke are of increasing concern. Following discharge from inpatient care, much of the care received by stroke survivors comes under 'informal care'. This paper aims to move beyond a solely numerical understanding of cost in relation to informal care to document and consider the complex ways stroke survivors are supported beyond formal care.
Methods: Through 40 semi-structured interviews with stroke survivors and caregivers we explored experiences of informal care. Drawing participants from the South London Stroke Register, a population register recording all first strokes for people in South London. Interviews were collected between June and September 2022, adopting a thematic analysis and inductive approach to analyse key themes.
Results: Three key themes emerged from the data; firstly, the study sought to compare one-off cost such as changes to the home/nursing equipment, to more routine cost such as travel/social expenses. Secondly, we examined the 'invisible' costs, exploring the mental health and emotional implications of stroke care. Finally, we explored the difficulties which individuals experienced in navigating the care system.
Conclusions: An economic and numerical understanding of informal care does not convey the complexities of 'costs' experience by both stroke survivors and caregivers. Research is needed to account for and document the diverse, longitudinal and often invisible costs in our financial and wider understandings of the impacts of stroke specifically and long-term conditions in general.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Serum microRNA miR-491-5p and miR-206 as Indicators for Unfavorable Outcomes and Spontaneous Hemorrhagic Transformation after Ischemic Stroke

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Background and aims: Evidence about whether miR-491-5p, miR-206, miR-21-5p or miR-3123 is associated with outcomes after acute ischemic stroke (AIS) is scant. We aim to explore the relationship between these four microRNAs and functional outcomes as well as spontaneous hemorrhagic transformation (HT).
Methods: We prospectively included AIS patients, collected blood samples and assayed for miR-21-5p, miR-206, miR-3123 and miR-491-5p. MiRNAs expression was measured by quantitative real-time polymerase chain reaction and log-transformed. Unfavorable functional outcome was defined as modified Rankin Scale score⩾ 3. Spontaneous HT referred to hemorrhage at ischemic site detected by follow-up imaging but not by admission imaging, without reperfusion therapies usage. Logistic regression generalized additive model and 2-piecewise regression model were used to explore the independent, dose-dependent relationship between miRNAs expression and outcomes.
Results: We included 215 patients (66.7 ± 14.5 years; Female 38.6%). Lower expression of miR-491-5p significantly increased the risk of unfavorable functional outcomes at 3 months (OR 0.81 [95% CI, 0.66–0.98], P=0.037) and 1 year (OR 0.76 [95% CI, 0.61–0.94], P=0.011). Higher expression of miR-206 significantly increased the risk of spontaneous HT (OR 1.64, 95%CI 1.17–2.30, P= 0.004). Nonlinear, dose-dependent manners were found with inflection points of 2.103(miR-491-5p and 3-month outcome), 2.180(miR-491-5p and 1-year outcome) and 2.037(miR-206 and spontaneous HT), respectively.
Conclusions: Lower miR-491-5p expression increased the risk of unfavorable functional outcomes. Higher miR-206 expression increased the risk of spontaneous HT. These two miRNAs may be as the potential biomarkers for functional outcomes and spontaneous HT after AIS.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Acute reperfusion treatments in ischaemic stroke beyond conventional time windows in a cohort of elderly and very elderly patients

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Background and aims: Although elderly and very elderly people (defined as ⩾ 80 and ⩾ 90 years old) account for over 30% of stroke admissions, they are under-represented in RCTs of reperfusion therapies, particularly in trials of extended time windows. In the last years, age limits to intravenous thrombolysis or mechanical thrombectomy were abolished but real-world data on safety and efficacy of acute reperfusion strategies beyond conventional time windows are lacking.

Methods: We retrospectively analyzed data of 171 consecutive patients treated beyond conventional time windows, from January 2020 to June 2022. The primary endpoint was favourable outcome, defined as 3-months mRS score 0-2. As we included selected patients with pre-stroke disability, for these patients a favourable outcome was defined as mRS score of 3.

Results: Elderly people had significantly lower chances of favorable outcome (OR: 4.82 95%, p<0.00), and higher risk of death (OR:8.47 95%CI [3.1-23.5]; p<0.00), whereas rates of complete or near complete recanalization and rates of symptomatic intracranial hemorrhage did not differ. In a multiple logistic regression analysis, age ⩾ 80 years old (OR: 3.74 95%, p<0.00) baseline NIHSS (OR:1.11, p=0.00) and baseline mRS (OR:3.15, p=0.02) were independent predictors of outcome.

Conclusions: This is the first real-word study verifying the functional outcome of reperfusion strategies beyond conventional time windows in elderly patients. Our results showed that age ⩾ 80 years old is a strong and independent predictor of long-term disability or death. Future analysis should clarify which patients may benefit most from late reperfusion treatments.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Systemic Immune-Inflammation Index as a Predictor of Early Neurological Deterioration in Acute Atherosclerotic Ischemic Stroke

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Background and aims: Although several systemic Inflammation indices have recently been correlated with stroke severity and functional outcome, the pathogenesis is largely unknown. This study investigated whether systemic immune-inflammatory index (SII) could predict early neurologic deterioration (END) by subtypes of acute ischemic stroke.

Methods: From Jan 2019 to Dec 2021, a total of 697 consecutive patients with acute ischemic stroke who were hospitalized within 72 hours from stroke onset were prospectively enrolled. The patients were divided into 4 groups by quartile of SII which was calculated as platelets x neutrophils/lymphocytes. END and stroke progression/recurrence were captured during the first 7 days after stroke onset by predetermined definitions. We performed logistic regression analysis to evaluate the association between SII and END, and examined the difference in the association according to the stroke subtypes.

Results: END occurs in 135 patients: 24 (3.4%) for Group I, 25 (3.6%) for Group II, 33 (4.7%) for Group III and 53 (7.6%) for Group IV. Among END subtypes, progression/recurrence of stroke was most common. In logistic regression model, an adjusted OR of END and stroke progression/recurrence for group IV was 2.80 (95% CI, 1.45-5.43) and 2.18 (95% CI, 1.10-4.32) respectively. Among stroke subtypes, group IV had significantly increased END (OR 4.24; 95% CI, 1.42-12.64) and stroke progression/recurrence (OR 4.13; 95% CI, 1.39-12.27) only in large artery atherosclerosis.

Conclusions: SII is an independent predictor of END in acute atherosclerotic ischemic stroke.

Disclosure of interest: No

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PATJ depletion induces endothelial activation and vascular inflammation through nuclear recruitment of YAP

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Background and aims: GWAS studies associated *PATJ* gene with ischemic stroke (IS) functional outcome. We recently shown that *PATJ* depletion in human cerebral microvascular endothelial cells (hCMEC/D3) induces endothelial to mesenchymal transition, mediated by Notch, TGFb, PI3K and Hippo signaling. The Hippo activator Yes associated protein (YAP) modulates vascular inflammation by interacting with the nuclear factor kB (NF-kB) suppressor TRAF6 (tumor necrosis factor receptor-associated factor 6). The aim of this study was to determine the interplay between PATJ and Hippo signaling in modulating endothelial activation.

Methods: *PATJ* knockdown (KD) cells were generated by infection of lentiviral particles carrying shRNA. The inflammatory profiles were determined by measuring cytokines levels using the multiplex Cytokine A Magnetic Luminex® Assay, and studying the expression of the adhesion proteins ICAM-1 and Selectin-E. The cellular localization of YAP, as well as the NF-kB activation, were studied by subcellular fractionation followed by WB.

Results: *PATJ* KD cells showed increased levels of interleukins (IL)-6 and IL-8 as well as higher expression of adhesion molecules. Lipopolysaccharide incubation exacerbated their inflammatory profile. YAP mostly located in *PATJ* KD cells' nucleus. Loss of cytosolic YAP increased TRAF6 ubiquitination, favoring NF-kB translocation to the nucleus and inflammatory phenotype activation.

Conclusions: In endothelial cells *PATJ* depletion favors a greater inflammatory response characterized by increased expression of adhesion

proteins and higher production of IL-6 and IL-8. As inflammatory reactions play multiphasic and complex roles in the progression of IS, further research is needed to elucidate the role of PATJ in functional outcome after IS.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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THE COMORBIDITY OF DEPRESSION BEFORE AND AFTER STROKE: A NETWORK ANALYSIS

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Background and aims: According to the network theory of depression, unravelling the symptom-level links between depression and stroke-associated deficits is essential to understand the comorbidity of depression and stroke. This study applies network analyses to map associations between single depressive symptoms, functional limitations, and memory deficits before and after first-ever stroke.

Methods: Data from 10,797 participants from the English Longitudinal Study of Ageing without a history of stroke at baseline (wave 1) was analyzed. 425 (3.94%) participants with first-ever stroke during the 12-year follow-up (waves 2-7) were matched to stroke-free controls using propensity scores. Symptom-differences between stroke cases and controls were computed using pairwise comparisons (FDR-corrected). Association networks and bridge statistics between single depressive symptoms, functional limitations, and memory, were estimated and plotted at several time points before and after stroke.

Results: Functional limitations and somatic symptoms of depression ("could not get going", "everything was an effort") increased at the assessment before stroke; memory deficits and affective symptoms additionally increased after stroke (Figure 1). Network analyses supported these findings and revealed that somatic symptoms play important role in bridging depressive symptoms and stroke-associated deficits (Figure 2).

Conclusions: The network approach highlights the unique role that somatic symptoms play in the comorbidity of depression and stroke, which arises even before incident stroke.

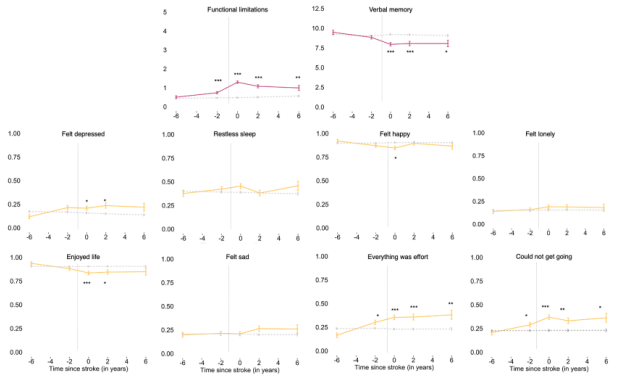

Figure 1. Frequencies of functional limitations, memory score, and single depressive symptoms, at time points before and after stroke.

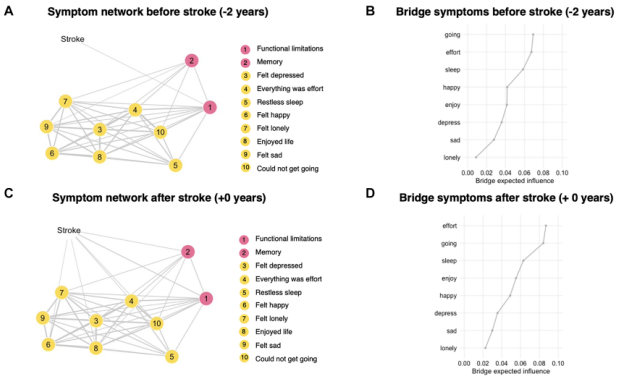

Figure 2. Symptom networks and bridge symptoms before and after stroke.

Disclosure of interest: No

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Plasma Brain-derived tau optimizes 90-day functional outcome prediction in acute ischemic stroke

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Background and aims: Available LVO-AIS prognosis scores are complex, time-consuming, and of heterogeneous performance. We investigated if an AIS blood-based multi-marker panel, could improve outcome prediction of successfully recanalized LVO-AIS patients.

Methods: We evaluated a prospective cohort of successfully recanalized (mTICI 2b-3) EVT-eligible LVO-AIS patients. Plasma was obtained at admission, after EVT, 24- and 72-hours. Brain derived-tau (BD-tau), glial fibrillary acidic protein (GFAP), neurofilament light chain (NfL), and total-tau (T-tau) were measured with single-molecule array (Simoa). Good outcome was defined as mRS$<$3 at 3-months.
Results: We enrolled 78 patients, and 35 (44.9%) presented good outcome. Upon admission, BD-tau, was significantly higher in bad functional outcome patients. At 24 hours all four biomarkers were significantly higher in the bad functional outcome group. There were no significant associations between biomarkers' variation rate and outcome, except for GFAP between admission and EVT ($p<0.001$). Among clinical, imaging, and biomarker predictors, BD-Tau presented the highest discriminative performance upon hospital admission (AUC=0.76, $p<0.001$). A multidimensional exploratory analysis defined the combination of age, BD-Tau at admission, and involvement of internal capsule or M5 ASPECTS regions at 24 hours CT scan as the best predictor (AUC=0.88, $p<0.001$).
Conclusions: Admission BD-tau presented the best discriminative performance for 90-day outcome prediction, outranking standard of care measurements such as NIHSS and ASPECTS. The integration of this assessment in a simplified outcome prediction model, including age and two ASPECTS regions, presented an excellent discriminative capacity. This 90-day functional outcome model is largely observer-independent and, therefore, minimizes human-related biases and potentiates inter-study comparability.
Disclosure of interest: No

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Association of cerebellar volumes with cortical excitability in chronic stroke

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Background and aims: Excitability of motor cortices is associated with residual motor function and recovery in stroke patients. Previous analyses linked microstructural properties of the dentato-thalamo-cortical tract, the main cerebellar outflow tract, to cortical excitability assessed by means of transcranial magnetic stimulation (TMS). The aim of this study was to expand the understanding of these findings by correlating measures of motor cortex excitability to distinct cerebellar volumes.
Methods: MRI-scans and TMS-data of 18 chronic stroke patients with supratentorial ischemic lesions were analyzed. Cortical excitability was estimated by calculating the maximum slope ($Slope_{max}$) of recruitment curves of motor evoked potential of the affected hemisphere. T1-weighted images were processed with volBrain32 and the CERES pipeline for cerebellum lobule segmentation and volumetric analysis. Linear regression models were fitted including age, excitability of the contralesional hemisphere and the integrity of the corticospinal tract as nuisance variables.
Results: Median age of stroke patients was 64 (inter-quartile-range 60-75), three stroke patients were female. $Slope_{max}$ was positively associated with larger volumes of the contralesional cerebellar hemisphere (P=0.007) and the total volume of the cerebellar lobule IV (P=0.019).
Conclusions: These findings expand the understanding of how the cerebellum influences the functional outcome of ischemic stroke patients and might serve as a potential target for invasive and non-invasive stimulation approaches.
Disclosure of interest: No

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INFLUENCE OF GEOLOCATIONAL FACTORS ON PATIENT OUTCOMES POST ENDOVASCULAR THERAPY : A POPULATION BASED ANALYSIS ACROSS THE LARGE PROVINCE OF SASKATCHEWAN

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Background and aims: Endovascular treatment (EVT) of acute stroke requires efficient transportation. While *probabilistic models have been developed to postulate the influence of distance and processing times in drip and ship models (1), real life data has not been well studied. We retrospectively analyzed a registry of acute ischemic stroke patients that underwent EVT in the province of Saskatchewan.* Outcomes, measured by modified ranking scale (mRS), were compared across rural and urban populations.
Methods: A linked registry was used to track patients who underwent EVT from August 2017 to December 2022. Regional postal codes and first imaging sites were used to determine where patients resided, where they were transported from, and distance from the comprehensive stroke center (CSC). Statistics were performed with Stata MP 16. Data visualizations were performed in Microsoft Power BI.
Results: Among 320 patients who underwent EVT, 52% lived in large urban areas, 27% lived in smaller urban areas, and 21% lived in rural areas. Those living in rural areas had significantly worse mRS scores compared to those living in large urban areas cOR 1.42 (CI 1.32-1.98). Larger distance from the CSC was positively correlated with transport times, and negatively correlated with independent functional outcomes.
Conclusions: Real world geographic factors influence time to treatment and larger distances pose a great challenge in achieving independent functional outcomes post EVT. Strategies should be implemented to improve access to endovascular treatment across the range of population including those that live in more remote communities.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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How relevant is the overestimation of pre-stroke functional status in stroke patients undergoing mechanical thrombectomy?

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Background and aims: The modified Rankin scale (mRS) is a clinician-reported classification of global functional impairment. It is frequently used in the emergency setting to estimate pre-stroke functional status in stroke patients who are candidates to acute revascularization therapies (ps-mRS). We aimed to describe the agreement between pre-stroke mRS evaluated in the ED (ED ps-mRS) and pre-stroke mRS evaluated comprehensively after admission (post-admission ps-mRS).
Methods: We conducted a retrospective study of consecutive ischemic stroke patients undergoing mechanical thrombectomy during a 4-year period, with available ED ps-mRS and post-admission ps-mRS. ED ps-mRS

was evaluated by the treating neurologist and documented in the emergent stroke treatment protocol. Post-admission ps-mRS was retrospectively evaluated based on information registered in the clinical records by treating physicians, case-management nurses and social service workers. Collection of demographic and clinical characteristics and 3-month outcomes. Groups with and without overestimated pre-stroke functional status (defined as an ED ps-mRS < post-admission ps-mRS) were compared.

Results: Among a final population of 422 patients (median age 77 years, 50% female patients, median NIHSS 14), concordance of ED ps-mRS and post-admission ps-MRS was found in 64% of patients (Cohen´s kappa=0.498, p<0.001). Overestimation of pre-stroke functional status was found in 103 patients (24%). Patients with overestimated pre-stroke functional status were older (p<0.001), more frequently presented diabetes (p=0.003) and less frequently presented 3-month functional independence (p<0.001).

Conclusions: Disagreement between ED ps-mRS and post-admission ps-mRS occurs in 1/3 of patients. Overestimation of pre-stroke functional status may induce a mismatch between expected and observed 3-month functional outcomes.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Prognostic role of serum ICAM-1 in patients with acute ischemic stroke

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Background and aims: Intracellular adhesion molecule-1 (ICAM-1) which is elevated in atherosclerosis and cardiovascular diseases is also an important inflammatory marker in patients with acute ischemic stroke. The aim of the study was to assess the correlation between ICAM-1 and the prognosis of acute ischemic stroke (AIS).

Methods: 86 patient were enrolled in this study. Fasting blood of all patients was collected within 24 hours of admission. Serum ICAM-1 concentration was measured by the enzyme-linked immunosorbent assay (ELISA). The modified Rankin Score (mRS) was used to determine the clinical outcome 3 months after stroke. According to the outcomes, patients were divided into two groups: patient with good and poor outcomes. The good prognosis was mRS < 3, while poor prognosis was mRS ⩾ 3.

Results: The serum ICAM-1 concentration of patients with poor prognosis were remarkably higher than that of patients with good prognosis. The levels of serum ICAM-1 in patients with AIS in the good prognosis group and the poor prognosis group were (122.4 ± 11.8) and (154.2 ± 12.8) pg/ml, respectively. According to the logistic regression analyses, the serum concentration of ICAM-1 is an independent predictor in patients with AIS (p = 0,007).

Conclusions: The serum ICAM-1 concentration in patients with AIS with poor prognosis was remarkably higher than that in the good prognosis patients. The baseline serum ICAM-1concentration can predict the prognosis of AIS.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Elevated Leukocyte Counts Are Associated With Worse Functional Outcomes in Patients with Large Vessel Occlusion

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Background and aims: Despite recent advancements in the treatment of acute ischemic stroke with large vessel occlusion (AIS LVO), recovery remains variable, suggesting other factors independent of circulation may influence outcomes. We sought to investigate the time-dependent impact of blood-derived leukocytes on functional outcomes in AIS LVO patients treated with endovascular thrombectomy (EVT).

Methods: A multi-center, retrospective analysis was performed on sequential AIS LVO patients presenting May 2016 to May 2019. Complete blood counts (CBC) were evaluated from venous blood collected at three different time frames: <24, 25-48 and 49-72 hours from last know well (LKW). A poor outcome was defined as a modified Rankin Score of ⩾3 at 90 days. Multivariable logistic regression was performed to evaluate the association between leukocyte counts and outcomes, adjusting for covariates.

Results: A total of 355 patients were included [male 51%; median age 68 (58-80)]. After adjusting for age, sex, stroke severity (presenting NIHSS), use of alteplase, percent recanalization with EVT and symptomatic intracranial hemorrhage, an elevated absolute monocyte count within 24 hours of LKW (OR=1.12 95% CI:1.03-1.23; p=0.01), as well as a greater neutrophil/lymphocyte ratio (OR=1.10 95% CI:1.03-1.17; p=0.01) post-EVT at 25-48 hours, was found to be associated with a poor outcome.

Conclusions: Based on our analytical cohort, a more robust inflammatory response post-stroke may be associated with worse outcomes in patients with LVO. Larger prospective studies are needed to better understand the time-dependent role of leukocyte subtype profiles, as well as identify other biomarkers involved in the inflammatory cascade post-stroke.

Table 1. Odds ratios associated with poor functional outcome at 90 days.

Patient Characteristics	Poor mRS (≥3) OR (95% CI)	p-value
Age (per year)	1.04 (1.02-1.06)	<0.01
Male	1.14 (0.67-1.93)	0.62
NIHSS (per point)	1.08 (1.04-1.12)	<0.01
Symptomatic ICH	4.89 (2.09-11.46)	<0.01
Received alteplase	0.49 (0.29-0.81)	0.01
mTICI Scale (per point)	0.46 (0.31-0.68)	<0.01

Abbreviations: OR = Odds ratio, CI= Confidence Interval, NIHSS = National Institute of Health Stroke Scale, mTICI =Modified Thrombolysis in Cerebral Infarction Scale, mRS = Modified Rankin Scale

Table 2. Time-dependent leukocyte counts and ratios associated with poor functional outcome at 90 days.

	Poor mRS (≥3) OR (95% CI)	p-value	Poor mRS (≥3) OR (95% CI)	p-value	Poor mRS (≥3) OR (95% CI)	p-value
Time frame from LKW	<24 hours		25-48 hours		49-72 hours	
Absolute Monocyte Count (per 100 cells)	1.12 (1.03-1.23)	0.01	0.99 (0.90-1.09)	0.87	1.06 (0.96-1.16)	0.28
Neutrophil/Lymphocyte Ratio	1.02 (0.99-1.05)	0.32	1.10 (1.03-1.17)	0.01	1.04 (0.99-1.09)	0.15
Lymphocyte/Monocyte Ratio	0.88 (0.75-1.03)	0.10	0.84 (0.65-1.07)	0.16	0.87 (0.66-1.14)	0.32

Abbreviations: OR = Odds ratio, CI= Confidence Interval, LKW = Last Known Well, mRS = Modified Rankin Scale

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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LASSO PREDICTION OF FUTILE RECANALIZATION AND TREATMENT RESPONSE IN PATIENTS WITH ANTERIOR LARGE VESSEL OCCLUSION STROKE RANDOMISED TO MECHANICAL THROMBECTOMY

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Background and aims: Mechanical thrombectomy (MT) is an effective treatment of large vessel occlusion (LVO) stroke. However, about 50% of patients remain functionally dependent despite successful revascularisation. We aimed at predicting futile recanalization (FR) in patients randomized to MT and identifying factors associated with treatment response.
Methods: We retrospectively analysed the MR CLEAN Trial data (n= 500) including 115 patients with anterior LVO strokes randomised to MT with successful recanalisation according to the modified thrombolysis in cerebral infarction (mTICI) score of 2b or 3.
FR was defined as modified Rankin scale (mRS) ⩾3 points three months after stroke. We predicted FR in a 5-fold cross validation using least absolute shrinkage and selection operator (LASSO) based on age, sex, systolic blood pressure, blood glucose, blood thrombocyte count, pre-stroke mRS, admission NIHSS, ASPECTS, collateral status and time from onset to MT. Logistic regression with interaction terms was used to assess different factors for enhancing treatment response.
Results: 56.5% of patients experienced FR, correctly predicted in 67% of cases (sensitivity of 76.9% and specificity of 52.0%). The area under the curve was 0.7 [0.603, 0.796]. Most important predictors were collateral status, pre-stroke mRS and admission NIHSS. Male sex ($p_{interaction}$ = 0.014) and better collaterals ($p_{interaction}$= 0.046) enhanced treatment response to MT.
Conclusions: Compared to observational data, investigating FR in stroke patients using data from randomised MT trials is less susceptible to treatment selection bias. Our model identified collateral status, pre-stroke mRS and admission NIHSS as most relevant predictors for FR.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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EXTERNAL VALIDATION OF RISK PREDICTION MODELS FOR POST-STROKE MORTALITY IN BERLIN

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Background and aims: Prediction models for post-stroke mortality are important tools to inform medical professionals' decision-making. Despite the abundance of published models, external validation studies that are critical to assess transportability to stroke patients outside the original settings are scarce. We aimed to evaluate the performance of two prediction models for post-stroke mortality in Berlin.
Methods: We used data from the "Berlin – SPecific Acute Treatment in Ischemic or hemorrhAgic stroke with Long term follow–up" (B-SPATIAL) registry, including patients from 15 Berlin stroke units between 2016-20. We assessed the performances of Bray et al.'s model for predicting 30-day all-cause mortality and Smith et al.'s model for in-hospital mortality. The latter was validated only in a subset due to data availability. Discrimination was assessed calculating c-statistics and calibration comparing decile groups of observed and estimated risks.
Results: For the 30-day all-cause mortality model, we included 7,667 patients and observed 746 (9.7%) deaths, compared to 662 (8.6%) predicted by the model. A c-statistic of 0.867 indicated good discrimination performance. In the calibration plot, predicted and observed risks were close for all decile groups. For the in-hospital mortality model, we observed 96 (5.8%) deaths among 1,660 patients, while the model predicted only 64 (3.8%) deaths with a corresponding c-statistic of 0.873. The calibration plot revealed an underestimation of the in-hospital mortality risk, especially among high-risk patients.
Conclusions: Both models showed good discrimination performance. While the 30-day all-cause mortality model was well-calibrated for the Berlin setting, recalibration of the in-hospital mortality model is advisable.
Disclosure of interest: Yes

PROGNOSIS AND OUTCOME AFTER STROKE

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Functional Outcome in Posterior Circulation Stroke Patients Presenting with Mild Symptoms

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Background and aims: Posterior circulation ischemic stroke patients may present with low National Institutes of Health Stroke Scale (NIHSS), however, a proportion of patients might be disabled at 3 months. We investigated prognostic factors associated with unfavourable outcomes in posterior circulation stroke patients presenting with low NIHSS.
Methods: Clinical data of consecutive posterior circulation ischemic stroke patients presenting with NIHSS<=5 were retrospectively analysed from the Basilar Artery Treatment and Management (BATMAN) registry. Clinical features were evaluated within 24 hours from symptom onset. Functional outcomes were defined as disability/death (modified Rankin Scale, mRS 2-6) and poor outcome (mRS 3-6).
Results: Overall 216 patients were included, mean age (±SD) 65 years (±15.8), median (IQR) NIHSS 2 (1-4), 67 (35%) had a large vessel occlusion. Intravenous thrombolytic was administered in 54 (24%) patients, 15 (7%) received endovascular treatment and 9 (4%) combined treatment. At three months, 52 (24%) of patients had disability/death, 26 (12%) had poor outcome. After logistic regression analyses adjusted for age, NIHSS (OR 1.47, 95%CI=1.20-1.80 for disability/death; OR 1.38, 95%CI 1.00-1.80 for poor outcome), bulbar symptoms (OR 3.90, 95%CI 1.40-11.10 for disability/death; OR 4.6, 95% 1.3-17 for poor outcome) and bulbar lesion (OR 3.20, 95%CI=1.20-8.70 for disability/death; OR 8.20, 95%CI 2.10-31.20 for poor outcome) were associated with unfavourable outcomes.
Conclusions: Approximately a fourth of posterior circulation stroke patients presenting with low NIHSS had disability at three months. Careful clinical examination of bulbar symptoms/signs in addition to the NIHSS may identify posterior circulation stroke patients at high risk of disability.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Symptomatic Steno-occlusion of Major Cerebral Arteries Increases The Risk of Stroke Recurrence In Acute Ischemic Stroke Patients With Atrial Fibrillation

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Background and aims: We aimed to elucidate whether symptomatic steno-occlusion (SYSO), common in acute ischemic stroke (AIS) patients with atrial fibrillation (AF), increases the risk of recurrent stroke.

Methods: From a prospective cohort of patients with AIS and AF in South Korea, we selected patients who underwent MR angiography and completed 3-year follow-up. SYSO was defined as (1) ⩾50% stenosis or occlusion of cerebral arteries relevant to acute infarction or (2) residual stenosis after endovascular treatment (EVT). Using cause-specific hazard models with non-stroke death as a competing risk, the risk of recurrent stroke was estimated.

Results: A total of 916 patients (mean age, 74.6 years; male, 54.4 %; median NIHSS, 6) were enrolled for this study. During the median follow-up of 1095 days, 150 recurrent strokes including _45 fatal strokes and 158 non-stroke deaths were observed. Patients with SYSO, compared to those without, were more likely to be older, be female, have hypertension, diabetes and more severe stroke and be on more antiplatelets and less likely to be on anticoagulants at discharge (*P's*<.05). The cumulative incidence of recurrent stroke in patients with and without SYSO was 20.6% and 8.4% at 1 month, 24.7% and 9.7% at 1 year, and 30.1% and 12.4% at 3 years, respectively (*P*<.001). SYSO increased the risk of recurrent stroke (adjusted hazard ratio [95% confidence interval]; 3.02 [2.15-4.24]; *p*<.001).

Conclusions: This study shows SYSO substantially increased the risk of recurrent stroke in patients with AF. Accordingly, SYSO should be considered in risk stratification for AF.

Disclosure of interest: Yes

PROGNOSIS AND OUTCOME AFTER STROKE

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Predictive validity of the Clinical Frailty Scale in a UK stroke population: comparison of baseline and day 90 outcomes in subacute and chronic stroke using data from the Frailty & INEquality in STroke (FINE-ST) study

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Background and aims: Frailty and INEquality in STroke (FINE-ST) was a prospective five-centre longitudinal pilot cohort study in the East Midlands. To evaluate predictive validity of frailty, we tested the Clinical Frailty Scale against commonly used stroke outcomes. The study was prospectively registered (ISRCTN11241011).

Methods: Baseline and day 90 data were collected from consecutive stroke participants in two groups: subacute (<6 weeks of TIA/stroke, face-to-face) and chronic (>6 weeks, questionnaire), assessing CFS, modified Rankin score (mRS), Barthel index (BI), fatigue assessment scale (FAS) and mood (Geriatric Depression Score (GDS) at baseline, Zung depression scale (ZDS) at Day 90). Data were analysed using Spearman's Rank Correlation coefficients.

Results: Acute group (n=72): mean time from index event (83% ischaemic; 11% haemorrhagic, 6% TIA) to consent 0.19 (SD 0.4) months, age 71 (SD 10.7), 38.9% female, 9% frail (CFS⩾5). Baseline CFS correlated significantly with day 90 mRS (rs=0.46, p=0.0002) and BI (rs=-0.44, p=0.0003) but not with FAS (rs=0.15, p=0.24) and ZDS (rs 0.18, p=0.15).

Chronic group (n=135): index event (81% ischaemic; 13% haemorrhagic, 7% TIA) to consent 11.0 (SD 7.8) months, age 72.5 (SD 11.1), 32.6% female, 17.8% frail. Baseline CFS, correlated significantly with day 90 mRS (rs=0.61, p<0.0001), BI (rs=-0.54, p<0.0001), FAS (rs=0.27, p=0.0029) and ZDS (rs=0.23, p=0.014).

Conclusions: In subacute stroke and TIA, baseline frailty correlated with day 90 dependency and disability but not with day 90 mood and fatigue. In contrast, baseline chronic stroke frailty correlated with day 90 dependency, disability, mood and fatigue.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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THE ASSOCIATION BETWEEN NEIGHBORHOOD SOCIO-ECONOMIC STATUS AND THE FUNCTIONAL OUTCOME OF PATIENTS TREATED WITH THROMBECTOMY FOR ISCHEMIC STROKE

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Background and aims: Previous studies have examined the association between neighborhood socio-economic status and outcome after stroke, however, few have focused on patients treated with endovascular thrombectomy (EVT). We aim to examine the association between neighborhood socio-economic status (nSES) and functional outcome in patients with ischemic stroke that were treated with EVT.

Methods: We performed a post-hoc analysis with data from the MR CLEAN-MED trial collected between 2018 and 2021. In this study, nSES was measured as an aggregated composite score of residents' household income, educational attainment and employment status (SES-WOA), as compiled by 'Statistics Netherlands' (CBS) and linked to each patient's zip code. The association of nSES with short-term (NIHSS at 24 hours) and long-term (mRS at 90 days) outcome was analyzed using linear regression and ordinal logistic regression respectively, adjusted for relevant patient characteristics, including baseline NIHSS and age, as well as study treatment allocation.

Results: A total of 515 patients (47% female, mean age 71.6, mean baseline NIHSS 14) were included in the analyses. The median SES-WOA score was -0.016 (IQR -0.23 - 0.14). nSES was not associated with NIHSS at 24 hours (β -0.067(95%CI -5.5, 0.32)), but patients with a higher SES-WOA score were more likely to have a more favorable mRS at 90 days (OR 1.34 (CI95% 1.03, 1.73)).

Conclusions: Although there was no significant association with short-term neurological outcome, a higher SES-WOA score was associated with a more favorable functional outcome at 90 days.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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OUTPATIENT VALIDATION OF THE POSTERIOR NATIONAL INSTITUTES OF HEALTH STROKE SCALE (POST-NIHSS)

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Background and aims: The NIH Stroke Scale (NIHSS) underestimates the severity of posterior circulation strokes by excluding items such as dysphagia and gait ataxia. The POST-NIHSS improved the identification of posterior circulation stroke in the acute hospital admission phase. This study aims to assess the interobserver agreement of POST-NIHSS in outpatients and whether the scale discriminates between anterior and posterior-circulation stroke.

Methods: We studied consecutive adult patients from a university-based stroke outpatient clinic who suffered an ischemic stroke within the last two years. We excluded patients with stroke located in both anterior and posterior circulations, NIHSS⩾10, or dysphagia attributed to other causes. Two independent examiners evaluated all participants, blinded to which circulation was affected by the stroke.

Results: We included 20 participants: 16 with anterior and 4 with posterior stroke. Mean age was 54 (standard deviation - SD±17) and median NIHSS was 3 (interquartile range – IQR=2.8-4.2). POST-NIHSS was 0 (IQR 0-3.2) for both examiners. The interobserver agreement was 55% (weighted kappa=0.35, 95% confidence interval – 95%CI -0.05-0.75, p-value=0.09). The POST-NIHSS score for posterior and anterior circulation strokes were similar for both examiners (first examiner median difference=2.2, 95%CI -3.6 to 8.0; second examiner median difference=2.9, 95%CI -2.7 to 8.6).

Conclusions: In the outpatient setting, POST-NIHSS showed weak interobserver agreement and discriminated poorly between anterior and posterior circulation stroke. Improvements in posterior circulation symptoms over time may justify lower performance in outpatients compared to previous acute phase data.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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FUTILE RECANALIZATION PREDICTION WITH MACHINE LEARNING BASED DECISION TREE MODEL IN STROKE PATIENTS TREATED WITH THROMBECTOMY

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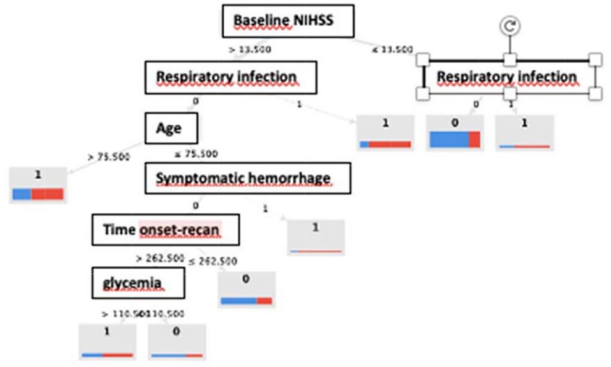
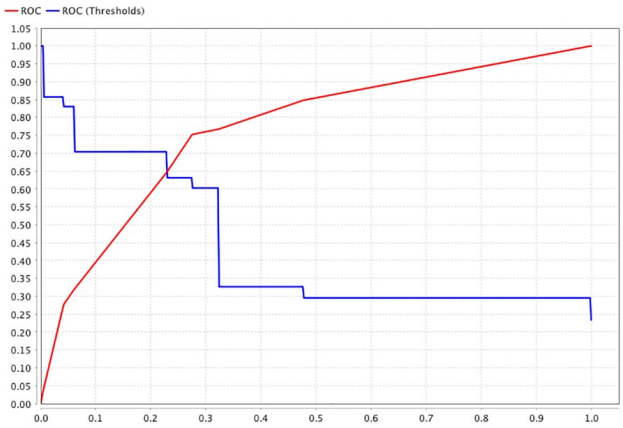
Background and aims: Despite complete recanalization (TICI ⩾2b) with endovascular treatment (EVT), functional independence at 90 days (mRS⩽2) is not achieved in half of large vessel occlusion strokes (futile recanalization: FR). The aim of this study was to create a decision tree model with machine learning (ML) techniques to predict FR in stroke patients treated with EVT

Methods: Retrospective analysis of a multicentric (12 hospitals) prospective registry of patients treated with EVT from 1/1/17 to 31/12/21 (NORDICTUS registry, Spain). Baseline, demographic and procedural variables were included.

Machine Learning algorithms were generated with RapidMiner Studio v.10 software. 75% of the cohort was used for model construction. Then, a cross-validation was performed in the reminder 25% to assess generalizability and accuracy of the model.

Results: The study included 3554 completely recanalized patients (TICI ⩾2b). FR was observed in1632 patients (45.9%), mean age was 72.8 (sd=12.6) and 53.8% were male.
The main observed predictors (Figure 1) and its weight were: respiratory infection (0.285), baseline NIHSS (0.219), serum glycemia (0.172) age (0.124), symptomatic hemorrhagic transformation (0.102) and time from onset to recanalization (0.091). The accuracy of the model was 73.76% for the validation cohort and the AUC 0.769 (Figure 2).
Conclusions: Machine learning based algorithms can build easy-to-use predictive models for FR in strokes treated with EVT that could be implemented for risk assessment in daily clinical practice.





Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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USING STRUCTURAL CONNECTIVITY INFORMATION FOR PROGNOSTICATION OF POST-STROKE APHASIA: TOWARDS A CLINICAL IMPLEMENTATION

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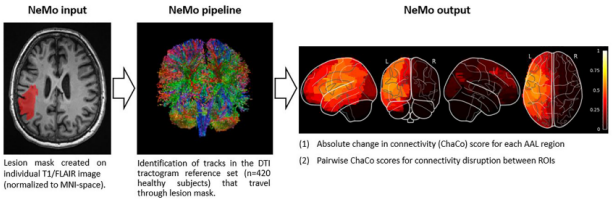
Background and aims: Prognostication of post-stroke language function may be important for clinicians to develop individualized treatment plans for aphasic stroke patients. The use of connectome disruption information for the prognosis in clinical practice is limited by the need to acquire diffusion tensor imaging (DTI) data, which is usually not part of clinical imaging protocols. We present a model-based approach to quantify connectome disruption with minimal user interaction, exclusively relying on routinely collected MR-images.
Methods: Language function at baseline and follow-up was assessed in 76 aphasic stroke patients, using the Boston Naming Test (BNT), Token Test (TT), and Semantic Verbal Fluency test (sVF). The Network Modification tool was used to calculate change in connectivity (ChaCo) scores as estimates of structural connectivity disruption for 13 left-hemispheric grey matter regions and right-hemispheric homologues by superimposing individual infarct masks onto a DTI tractogram reference set. Machine-learning multivariate prediction models were developed.
Results: Prediction models explained 46.4%-60.4% of variance at baseline and 60.1%-81.8% at follow-up. Baseline language and cognitive function were the most important variables to predict language function at follow-up, reducing the prediction error by 35.7%-38.1% and 19.0%-42.4%, respectively. ChaCo scores explained up to 12.5% additional variance, with left superior temporal gyrus (9.9%) and right angular gyrus (12.5%) as most important network nodes.
Conclusions: Connectome disruption estimates improve prediction accuracy of post-stroke language function in addition to baseline language and cognitive function. Model-based connectivity analysis using routine morphological MRI might be a useful method for clinical prognostication of the individual patient's recovery trajectory.

Figure 1: Pipeline of the Network Modification (NeMo) tool.



The user inputs a mask of white matter pathology, which is then transformed into MNI space. The diffusion tensor imaging tractogram reference set, consisting of 420 healthy subjects, is searched for streamlines traveling through the lesion mask. The NeMo output consists of Change in Connectivity scores, i.e. regional as well as global connectivity changes in form of the weighted proportion of tracts connecting to a region which travel through the lesion mask. Figure adapted from Kuceyeski *et al.*, 2013. NeMo: Network Modification, FLAIR: Fluid-attenuated inversion recovery, MNI: Montreal Neurological Institute, DTI: Diffusion tensor imaging, ChaCo: Change in Connectivity, AAL: Automated anatomical labelling, L: Left hemisphere, R: Right hemisphere.

Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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FOLLOW UP LESION VOLUME IS ASSOCIATED WITH WORSE FUNCTIONAL OUTCOME IN PATIENTS WITH BASILAR ARTERY OCCLUSION: RESULTS FROM THE BASICS TRIAL

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Background and aims: Final ischemic lesion volume (FLV) is an important surrogate marker for 90-day functional outcome in patients with anterior circulation large vessel occlusions (LVOs). However, the association between FLV and functional outcome in basilar artery occlusion (BAO) stroke is unknown.

Methods: We analyzed 168 patients from the Basilar Artery International Cooperation Study (BASICS) Trial which assessed the benefit of endovascular treatment (EVT) in patients with BAO. Ischemic lesion was manually delineated on follow-up NCCT imaging. Primary outcome was assessed with the 90 day modified Rankin Scale (mRS) and secondary outcome was functional independence (mRS⩽2). We performed uni- and multi-variable regression analysis to assess the association between FLV and outcome.

Results: We included 107 patients based on availability and quality of the follow-up NCCT scan. Fifty-five (51%) patients were randomized to EVT. Overall, 34 (32%) patients achieved favorable functional outcome. Median FLV was 8.5 (1.3-27)ml and was significantly higher for patients with worse outcome (Figure 1). FLV was associated with worse functional outcome (OR: 0.96 (95%CI: 0.94-0.98), p<0.01; aOR: 0.95 (95%CI: 0.93-0.97); p<0.01; per ml) and reduced functional independence (OR: 0.95 (95%CI: 0.91-0.98), p<0.01; aOR: 0.94 (95%CI: 0.89-0.97); p<0.01; per ml). Treatment allocation did not significantly influence this association (OR: 0.99 (95%CI: 0.95-1.03), p=0.58, Figure 2).

Conclusions: Similar to anterior circulation LVO, in patients with a BAO, FLV is associated with worse functional outcome. FLV can provide valuable insights on tissue viability and could potentially be a surrogate marker for functional outcome in BAO patients.

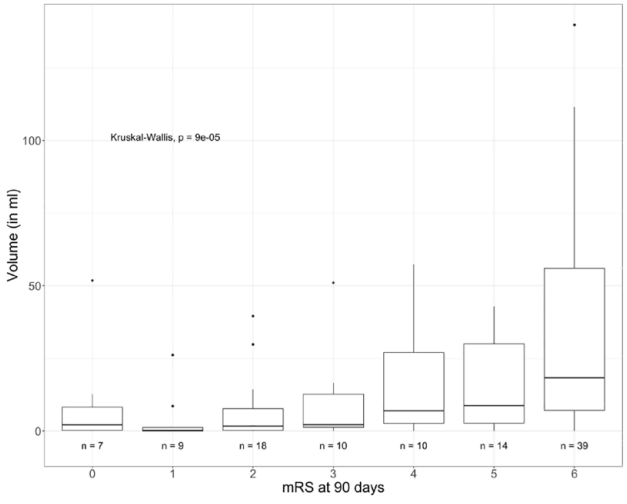

Figure 1: Follow-up lesion volume per 90-day modified Rankin Scale (mRS) category

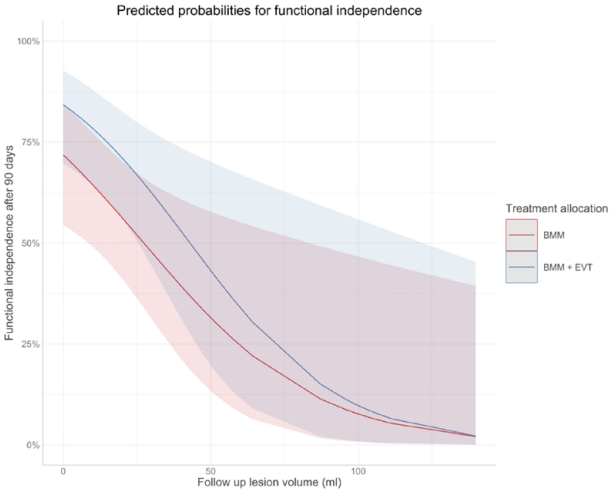

Figure 2: Binary interaction analysis to demonstrate the effect of EVT on the association of final lesion volume and functional independence (mRS≤2 after 90 days). (BMM: best medical management; EVT: Endovascular treatment)

Disclosure of interest: Yes

PROGNOSIS AND OUTCOME AFTER STROKE

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Concomitant COVID-19 infection during endovascular therapy does not affect long-term functional outcome, while short-term outcome is affected

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Background and aims: Previous studies suggest worse outcome after endovascular therapy (ET) in large vessel occlusion stroke (LVOS) patients with concomitant COVID-19 infection. However, functional outcome is inconsistently defined and control groups are frequently missing or reflect pre-pandemic conditions. We therefore aim to investigate the long-term functional outcome in comparison with a matched contemporary control group.

Methods: Leveraging the German Stroke Registry – Endovascular Treatment trial, an observational multicenter cohort of LVOS patients, we analyzed 4010 patients receiving ET between 02/2020 and 12/2021. Baseline characteristics, procedural parameters and functional outcome at 90 days were compared between patients with concomitant COVID-19 infection and matched controls and multivariable ordinal regression analysis was performed.

Results: COVID-19 patients (n=72, 1,8%) undergoing ET were more severely affected compared to patients without COVID-19. Median NIHSS and mRS were higher both after 24 hours (NIHSS: 14.5

[interquartile range 9-22] vs. 12 [6-18.75], p=0.015; mRS: 5 [4-5] vs. 5 [3-5], p=0.004) and at discharge in comparison to matched controls (NIHSS: 12 [6.75-16.75] vs. 6 [2-13], p=0.001; mRS: 5 [4-5] vs. 4 [2-5], p=0.023). Surprisingly, functional outcome at 3-month follow-up was similar (mRS: 4 [4-6] vs. 4 [2-6], p=0.34). Adjusted for potential confounders, COVID-19 was associated with worse functional outcome at discharge with a common odds ratio of 0.40 (95% CI 0.19–0.80, p=0.011), but not at 3-month follow-up (cOR 0.72, 95%CI 0.32–1.60, p=0.43).
Conclusions: COVID-19 should not deprive eligible patients of ET, as COVID-19 only affected short-term, but not long-term functional outcome in LVOS treated with ET.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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VESSEL OCCLUSION DETECTABLE ON IMAGING AND ITS ASSOCIATION WITH FUNCTIONAL OUTCOME IN PATIENTS WITH ATRIAL FIBRILLATION PRESENTING WITH ISCHAEMIC STROKE

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Background and aims: Embolic vessel occlusion is a key mechanism of ischaemic stroke in patients with atrial fibrillation (AF). We explored the prevalence of any vessel occlusion detectable on imaging and its association with functional outcome.
Methods: We studied patients with AF presenting with ischaemic stroke who underwent CT-/MR-angiography on admission and were enrolled in the prospective Swiss Stroke Registry (2014-2021). We built multivariable logistic regression models to assess the association of any vessel occlusion with functional outcome as per modified Rankin Scale (mRS) score at 90 days.
Results: The analysis included 10,164 patients (median age 81.5 years, 47.8% female, median NIHSS 6; 14.7% on a vitamin K antagonist [VKA], 27.5% on a direct oral anticoagulant [DOAC], 57.8% not receiving oral anticoagulation). Angiography showed any vessel occlusion in 5,190 patients (51.1%), with the anterior circulation affected in 87.4%. In the total cohort, 2,960 (29.2%) and 2,990 patients (29.4%) received thrombolysis and endovascular treatment, respectively. The proportion of patients with mRS 3-6 at 90 days was 60.6% and 42.7% in patients with and without vessel occlusion, respectively. In adjusted analyses, vessel occlusion was associated with mRS 3-6 at 90 days (odds ratio [OR] 1.94, 95% confidence interval [CI] 1.71-2.22). Consistent results were obtained in subgroups according to oral anticoagulation use (VKA, OR 1.98, 95% CI 1.40-2.80; DOAC, OR 2.34, 95% CI 1.82-3.01; none, OR 1.76, 95% CI 1.48-2.09).
Conclusions: Vessel occlusion detectable on imaging is common in patients with AF presenting with ischaemic stroke and is associated with poor functional outcome.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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AGE AND SUBGROUP SPECIFIC ASSOCIATIONS OF PRIOR MULTIMORBIDITY WITH POST-STROKE MORTALITY: A POPULATION-BASED STUDY

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Background and aims: Multimorbidity is common in patients with stroke, and is associated with excess post-stroke mortality. However, it is uncertain how predictive value differs in relation to age, stroke severity, aetiological subtype, prior disability and common vascular risk factors.
Methods: In a population-based incidence study (Oxford Vascular Study), we studied stroke patients ascertained from 2002-2017 and followed until 2020. Pre-stroke multimorbidity was quantified using the Charlson Comorbidity Index (CCI-weighted/unweighted) and related to 10-year all-cause, vascular, and non-vascular mortality using regression models adjusted for potential confounders. Predictive value was stratified by age, stroke severity (NIH Stroke Scale-NIHSS), aetiological subtype (TOAST), premorbid disability (modified Rankin Scale-mRS), deprivation, and history of vascular risk factors (hypertension, hyperlipidaemia, atrial fibrillation, smoking, anxiety/depression).
Results: Among 2454 patients (2194/86.5% ischemic; mean/SD age 74.1/13.9; 1201/48.9% male; mean/SD NIHSS 5.7/7.0), 1375/56.0% had at least one CCI comorbidity. Multimorbidity (unweighted-CCI$\geqslant$2vs0) was associated with premorbid disability (mRS$\geqslant$3: aOR 2.76, 95%CI 2.13-3.60) and several vascular risk factors (hypertension-1.56, 1.25-1.95; hyperlipidaemia-2.58, 2.03-3.28; atrial fibrillation-2.31; 1.78-2.98; smoking-1.37, 1.01-1.86), but remained independently predictive of all-cause death after adjustment (aHR 1.56, 1.37-1.78), driven mainly by non-vascular death (aHR 1.89, 1.55-2.29). Predictive value was greatest in patients with lower expected mortality, such as those aged $<$75 (HR 3.46, 2.67-4.48), those without premorbid disability (2.26, 1.94-2.64), and in minor stroke (2.83, 2.38-3.37). Results were similar using the weighted-CCI.
Conclusions: Although multimorbidity was associated with multiple potential confounders, it independently predicted long-term post-stroke mortality, particularly for non-vascular death and in otherwise lower risk groups.
Disclosure of interest: No

STROKE COMPLICATIONS

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Psychosocial health issues in stroke patients with Epilepsy : Impact on Happiness quotient

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Background and aims: To study effectiveness of two cognitive-behavioral-therapies(CBT), Guided-Mental-Imagery(GMI, Cognitive-Restructuring-Technique(CRT), in changing negative thinking/mind-set of stroke-patients-with-epilepsy in developing-nations. Psychosocial-health status crucial in treatment-outcome. Limited scientific literature/data available on this burning issue.
Methods: four-year longitudinal quasi-experimental research-design. Target: stroke patients-with-epilepsy, 30-65 years, N=118. Control n=50. With aid of inventory of negative thought scale, information collected pre/post training on: Occurrence/frequency of negative-thoughts in response to diagnosis, Incidence of negative-statements as result of automatic dysfunctional-thoughts, underlying-beliefs, incidence of headaches/migraine. Correlation of epilepsy with depression evaluated. Training/data collection for psycho-analysis done by psychiatrists. 14-item structured questionnaire contained : items on characteristics/knowledge of respondents on risk-factors, symptom, Rx-outcomes, current stress levels, beliefs, fear, despair, suicidal-tendencies, family-support, depression-level. epileptics went through counselling-sessions of CRT/CBT.
Results: applied statistical-methods. 80% Subjects received GMI/CR training able to notice/monitor their unhelpful thinking patterns than controls [multivarie-annova] & able to control them better when compared with control-group. [improving-QOL-quotient]. 74% Participants better-equipped to cope with stress/despair [74%], reduced Occurrence/frequency of negative-thoughts [85%], decreased negative statements[90], reduced incidence of headaches/migraine[92%].
Conclusions: CBT/CRT techniques in watering seeds of happiness are efficacious in epileptics. This underscores need to train health-care-professionals these psychological-techniques. Our-study shows importance of ability to cope, Psycho-social support, understanding Emotions, relief of acceptance of Belief System, positive-thinking. future such study with greater sample-size & more QOL-factors needed.
Recommendations: More participation of developing-nations in such research needed. Treatment-modalities limited to few resourceful-patients. OurNGO-project helps patients in better-recovery & is helpful in better happiness-quotient this improving QOL in stroke-related-epilepsy-patients.
Disclosure of interest: No

STROKE COMPLICATIONS

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Cortical haemorrhagic changes after mechanical thrombectomy for cerebral large vessel occlusion increase risk of post-stroke seizure

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Background and aims: Post-stroke seizure (PSS) is a major complication of stroke in patients with large vessel occlusion. Although haemorrhagic transformation is a risk for PSS, there are no studies of detailed characterisation of haemorrhagic changes after mechanical thrombectomy (MT) for risk of PSS.
Methods: Consecutive patients who received MT from January 2014 to October 2022 were enrolled. We performed post-procedural MRI during admission and evaluated any intracranial haemorrhages (any-ICH) including symptomatic haemorrhage (sICH), cortical haemorrhagic transformation (cHT) and cortical superficial siderosis (cSS). PSS was defined as a symptomatic seizure requiring clinical treatment, regardless of timing.
Results: Of the 541 patients (median age 77 years, 42.5% female), PSS were observed in 33 (6.1%) patients. The PSS group had lower ASPECTS (median [interquartile range]; 7 [6-8] vs. 8 [6-9], $p<0.05$), higher NIHSS score after MT (15 [15-21] vs. 6 [2-15], $p<0.001$), and worse mRS at 90 days (4 [3-5] vs. 3 [1-4], p=0.002). The incidence of PSS was higher in patients with any-ICH (78.8% vs. 36.7%, $p<0.001$). Regarding the characteristics of haemorrhagic changes, cHT and cSS were significantly more common in the patients with PSS than without (72.7% vs. 28.9%, $p<0.001$; 36.4% vs. 8.3%, $p<0.001$, respectively). In contrast, sICH was not statistically associated with incidence of PSS. In a multivariable logistic analysis, cHT and cSS were still associated with PSS (adjusted odds ratio, 95% confidence intervals; 6.19, 2.89-19.8; 7.31, 2.93-22.9, respectively).
Conclusions: ICH, especially cHT and cSS, may be a promising imaging biomarker of PSS in patients receiving MT.
Disclosure of interest: No

STROKE COMPLICATIONS

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NATURAL HISTORY OF DEPRESSION UP TO 24 YEARS AFTER STROKE: THE SOUTH LONDON STROKE REGISTER

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Background and aims: Limited data are available on the long-term natural history of post-stroke depression. We aim to determine the prevalence, incidence, cumulative incidence, duration, persistent and recurrent rates of depression up to 24 years after stroke.
Methods: Data were from first-ever stroke patients registered in the South London Stroke Register. The Hospital Anxiety and Depression scale was used to assess patients for depression symptoms. Depression was defined as a cut-off score >7. Inverse probability weighting was used to deal with missing data.
Results: The prevalence of depression was stable at approximately 30% at any time up to 15 years after stroke, with a slight increase to 40% from 15-year onwards. Cumulative incidence of depression was 60%. Over 50% of patients had their first episodes within 1 year after stroke and about 90% within 5 years after stroke. 47% of the patients with depression at 3 months had recovered at 1 year. New onset and persistent depression were less common in later years, with recurrent cases comprising the largest proportion of depressed patients from 5-year onwards. Prevalence was higher in patients with severe physical disability, severe stroke, pre-stroke depression or cognitive impairment (40% vs 30%).
Conclusions: PSD featured had early onset, short duration and high recurrence, with recurrent depression comprising the greatest proportion of patients after 5 years. The prevalence of PSD was 10% higher in patients with defined risk factors. More medical resource should be allocated to those who ever depressed in monitoring recurrence in the long term.
Disclosure of interest: No

STROKE COMPLICATIONS

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In-stent restenosis after vertebral artery origin stenosis stenting: a nomogram for risk assessment

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Background and aims: To propose a nomogram for individual risk assessment of in-stent restenosis (ISR) after vertebral artery origin stenosis (VAOS) stenting.
Methods: We included 793 patients with VAOS treated with stenting from October 2006 to May 2013, with a median follow-up of 27.8 months. Cox regression and the least absolute shrinkage and selection operator (LASSO) regression were adopted for variable selection. The nomogram was formulated and validated by concordance indexes (C-indexes) and calibration curves. An in-stent restenosis risk table (ISR-RT) was subsequently generated for risk stratification. Differences between low-, intermediate-, and high-risk levels were shown by Kaplan-Meier curves and compared by log-rank test.
Results: The training and validation set included 594 and 199 patients, with a mean ISR rate of 37.2% and 35.2%. Stent type (HR=1.64, 95%CI 1.26 to 2.14), stent diameter (HR=2.48, 95%CI 1.77 to 3.48), history of peripheral vascular disease (HR=2.17, 95%CI 1.17 to 4.00), history of transit ischemic attack (HR=1.45, 95%CI 1.05 to 2.14), and left-side involvement (HR=1.33, 95%CI 1.04 to 1.69) were included in the nomogram. The C-indexes at 6 and 12 months were 0.650 and 0.611 in the training set, and 0.713 and 0.603 in the validation set, respectively. Compared with low-risk patients, the intermediate- and high-level group had 1.46 ($p=0.0235$) and 2.28 ($p<0.0001$) higher chances of developing ISR in 2 years.
Conclusions: A nomogram and a risk evaluation table were developed with good predictive ability for in-stent restenosis among patients with VAOS, which could serve as a practical approach for individualized risk evaluation.
Disclosure of interest: No

STROKE COMPLICATIONS

1416

Epilepsy in Stroke Patients

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Background and aims: We evaluated the relationship between stroke and the subsequent development of epilepsy within 10 years follow-up.
Methods: This study included a cohort of 42,925 patients who were first diagnoses as stroke between 2019 and 2021. To match each stroke patient, 218,478 control subjects were selected from the data-base.
Results: In this cohort, the prevalence of stroke was higher in female(62%) than in male(38%). The diagnosis of epilepsy was done at averagely 20 months after the diagnosis of stroke. Cox regression analysis showed that the HR of epilepsy was 7.658 times greater for patients with stroke (95% CI: 7.402-7.923) than for control group after adjusting for other risk factors. The HR of epilepsy was 1.08 (95% CI: 1.045-1.116) in female patients, 1.66(95% CI: 1.607-1.715) in diabetic patients, 1.679(95% CI: 1.625-1.734) in hypertensive patients, 1.831(95% CI: 1.626-2.062) in chronic kidney disease and 1.647(95% CI: 1.593-1.703) in hypercholesterol patients.
Conclusions: Our findings suggest that stoke may be independent risk factor for epilepsy in elderly patients(HR 7.658, 95% CI: 7.402-7.923). So we need to control and pay attention to epilepsy in elderly stroke patients.
Disclosure of interest: No

STROKE COMPLICATIONS

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A need for holistic and standardised assessment and management of patients in stroke follow-up clinic

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Background and aims: NICE guidelines recommend that all stroke follow-up clinic appointments should encompass discussions surrounding:

1) General wellbeing and effect on interpersonal relationships
   - Friendships
   - Family
   - Sexual relationships
2) Post-stroke complications (motor and non-motor)
   - Weakness
   - Falls
   - Pain
   - Mood
   - Cognition
   - Fatigue
   - Incontinence
   - Sleep
   - Appetite
3) Lifestyle modifications
   - Smoking cessation
   - Alcohol intake
   - Dietary
4) Return to driving, leisure activities and/or work

We investigated whether such discussions had taken place, therefore documented, in stroke follow-up clinic letters.

Methods: Authors pre-defined topics that should be discussed at follow-up clinic based on NICE guidelines. Follow-up clinic letters after ischaemic stroke at a large hyperacute stroke unit in UK from 1/1/20 to 30/6/20 were retrospectively analysed.
Results: 137 consecutive discharges were identified and 95 patients (69.3%) were followed-up in clinic [median time 134 days (120-155)]. General wellbeing was discussed in 66.3% of patients but return to work, interpersonal or sexual relationships (where applicable), were not discussed at all. Less than half the patients had a documented discussion on falls, fatigue, sleep, mood, cognition, or memory. Post-stroke pain and discussions on alcohol, appetite and dietary modifications or smoking were discussed in <10% (Figure 1).

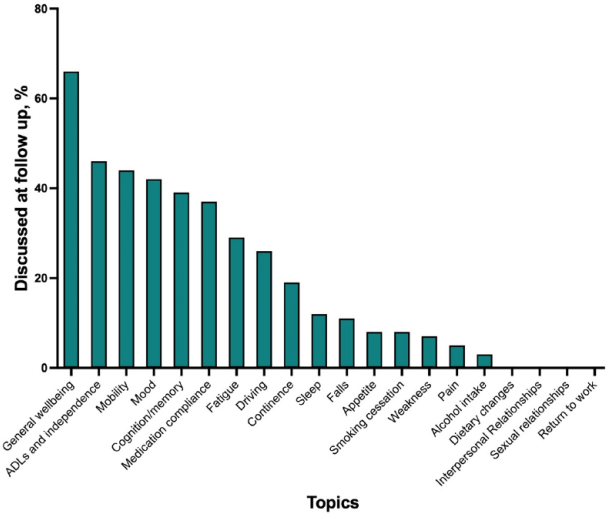

Figure 1. Topics discussed in stroke follow-up clinic.

Conclusions: Recommended topics are not being adequately discussed or documented at stroke follow-up clinic, particularly non-motor complications after stroke. The evaluation of patients at follow-up clinic needs to be standardised to ensure appropriate assessment and management of physical and cognitive sequalae post-stroke.
Disclosure of interest: No

STROKE COMPLICATIONS

1808

DECLINE IN ESTIMATED GLOMERULAR FILTRATION RATE AND RISK OF RECURRENT STROKE: RESULTS OF THE PROGRESS TRIAL

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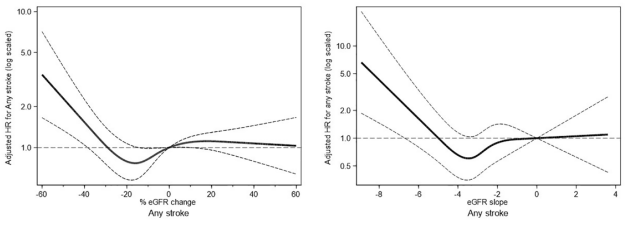
Background and aims: Studies of the relationship between declining kidney function according to %change or slope in estimated glomerular filtration rate (eGFR) and recurrent stroke are scarce. We examined the association of %change/slope of eGFR and recurrent stroke in the Perindopril Protection Against Recurrent Stroke Study (PROGRESS).
Methods: We set the baseline and follow-up period as 2 and 3 years, respectively. %change (<-30%, ⩾-30 to <0%, ⩾0 to <30 % and ⩾30%) and slope (<-5, ⩾-5 to < -3, ⩾-3 to <-1 and ⩾-1 ml/min/1.73m^2/year) in eGFR and recurrent stroke were examined in Cox proportional hazard models, with Harrel's C and net reclassification index (NRI) used to evaluate model improvement. Restricted cubic splines were used to assess the functional form of % change/slope of eGFR and recurrent stroke.
Results: During follow-up of 4591 patients, 233 had recurrent stroke. Using %change of ⩾-30 to <0% and slope of ⩾-5 to <-3 as the reference, the risk of recurrent stroke was elevated toward both sides. %change <-30%, adjusted hazard ratio (HR) (95% confidence interval) 1.86 (1.24-2.79); ⩾-30 to <0% % 1.43 (1.03-1.98); ⩾30% 1.34 (0.70-2.56). Slope <-5: 2.76 (1.57-4.86); ⩾-3 to <-1 1.32 (0.95-1.82); ⩾-1 1.69 (0.95-2.99). U or reverse J-like relationships were observed using restricted cubic spline.
Conclusions: Independent U or reverse J-like shape relations between declining kidney function and recurrent stroke. Adding kidney indicators significantly improved the model prediction for recurrent stroke at 1 and 2 years.



Disclosure of interest: No

STROKE COMPLICATIONS

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Intact endothelial cell autophagy attenuates outcomes of acute ischemic stroke in mice

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Background and aims: Acute ischemic stroke (AIS) deprives cerebral artery endothelial cells (ECs) of nutrients which decreases mTORC1 activity to initiate autophagic flux. We hypothesized that depletion of EC autophagy worsens outcomes of AIS.
Methods: First, adult male C57Bl6 mice consumed standard diet (control) or chow supplemented with the mTORC1 inhibitor rapamycin. After 3-weeks, phosphorylated ribosomal S6 / total S6 was greater ($p<0.05$) in liver segments of rapamycin vs. control fed mice, indicating mTORC1 repression. AIS was induced by transient middle cerebral artery occlusion (tMCAO, 60-min).
Results: tMCAO followed by reperfusion (R, 23 h) increased infarct volume, neurobehavioral deficits, and motor dysfunction, to a greater extent ($p<0.05$) in control vs. rapamycin-supplemented mice. Second, adult male C57Bl6 mice with intact EC autophagy-related protein 3 (*Atg3*^{WT}) or inducible depletion of EC ATG3 (*Atg3*$^{EC-/-}$) completed tMCAO+R. ATG3 colocalization with VE-Cdh5 increased ($p<0.05$) after tMCAO+R in ipsilesional vs. contralesional hemispheres of *Atg3*^{WT} but not *Atg3*$^{EC-/-}$ mice. Neutrophil infiltration, cell death, microglia and astrocyte activation, and neurodegeneration, were greater ($p<0.05$) in ipsilesional hemispheres of *Atg3*$^{EC-/-}$ vs. *Atg3*^{WT} mice. Further, infarct volume was greater ($p<0.05$), and motor and neurobehavioral performance were worse ($p<0.05$), in *Atg3*$^{EC-/-}$ vs. *Atg3*^{WT} mice. Third, tMCAO+R evoked infarct volume was less severe after rapamycin feeding in *Atg3*^{WT} but not *Atg3*$^{EC-/-}$ mice, underscoring the importance of EC autophagy.
Conclusions: Intact EC autophagy is protective concerning AIS, potentially via enabling: (i) recycling of damaged proteins; (ii) nutrient generation from degraded substrates; and / or (iii) arterial vasodilation for nutrient delivery. Supported by R01HL141540(JDS), AHAPRE1025910(SM).
Disclosure of interest: No

STROKE COMPLICATIONS

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EEG for monitoring of post-stroke delirium

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Background and aims: Establishing the diagnosis of post-stroke delirium (PSD) remains challenging, The EEG parameter relative delta power (RDP) has been associated with the presence of postoperative delirium. It remains unclear whether these results can be extrapolated to patients with PSD. The aim of this study was to explore whether RDP may differentiate between patients with and without delirium after ischemic stroke located in the middle cerebral artery (MCA) territory.

Methods: In a dataset of 514 patients with acute ischemic stroke, we used a chart review based on DSM-5 criteria to diagnose PSD. A subset of 60 patients was randomly selected, all with MCA infarction: 30 with left MCA infarction (15 with and 15 without delirium) and 30 with right MCA infarction (15 with and 15 without delirium). For each patient, the first 8 artifact-free epochs of 8 seconds were selected and RDP (0,5-4Hz) was computed using a fast Fourier transformation and averaged over all channels and epochs. RDP was compared using a Mann-Whitney-U-test.
Results: Median RDP among all channels and epochs, was significantly higher in patients with PSD (0.573; IQR 0.224) compared to patients without PSD (0,380; IQR 0,156) (p-value $<$0.001). When studying differences in RDP between patients with and without PSD among all derivations (channel against average reference), RDP in P3-Avg was associated with the lowest p-value ($<$0,001).
Conclusions: Preliminary results suggest that RDP significantly differs between patients with and without PSD after MCA infarction, implicating a potential role of this EEG parameter for objective PSD monitoring.
Disclosure of interest: No

STROKE COMPLICATIONS

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Incidence and Factors Associated with Venous Thromboembolism in Acute Stroke

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Background and aims: Investigate the yield of universal screening for deep venous thrombosis (DVT) among patients with acute stroke (AS) admitted to a comprehensive stroke center neurocritical care unit. Variation in local protocols used for DVT screening may explain the dissimilar rates reported in literature.
Methods: A quality improvement process was implemented at our institution for the early identification of DVTs. This retrospective study included consecutive patients admitted with AS between years 2020-2021 who underwent lower extremity Doppler ultrasonography within 24h of admission and twice weekly thereafter. Baseline demographics, clinical characteristics and outcomes were compared between participants with and without acute DVT. Poor outcome was defined as mRS $\geqslant$3. Statistical analyses were done in SPSS, with p for significance $<$0.05.
Results: A total of 346 patients were included; mean$\pm$SD age was 62$\pm$15 years, with 53% males. DVTs were seen for 33(9.5%) of cases. All cases were asymptomatic. DVT cohort had higher admission stroke severity (mean$\pm$SD NIHSS, 10$\pm$2 vs 8$\pm$1) and higher proportion of mechanical ventilation (55% vs 36%). Screening within 24 hours from admission identified DVTs in 85% cases. Diagnosis resulted in the placement of an inferior vena cava filter or the use of anticoagulation in 77% of the cases. DVT presence increased twice the risk of poor outcome at discharge (OR=2.2, 95% CI=1.1-4.6, p=0.03).
Conclusions: Aggressive DVT screening can result in the identification of a significant proportion of cases that can be preexistent or occur on the day of admission, albeit asymptomatic, and are associated with poor outcome.
Disclosure of interest: No

STROKE COMPLICATIONS

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The potential role of Ultrasensitive CRP and Serum Amyloid A taken at baseline as a predictor of haemorrhagic transformation at 24 hours in stroke patients. Results from an interim analysis of the clinical section from the NIMBLE study

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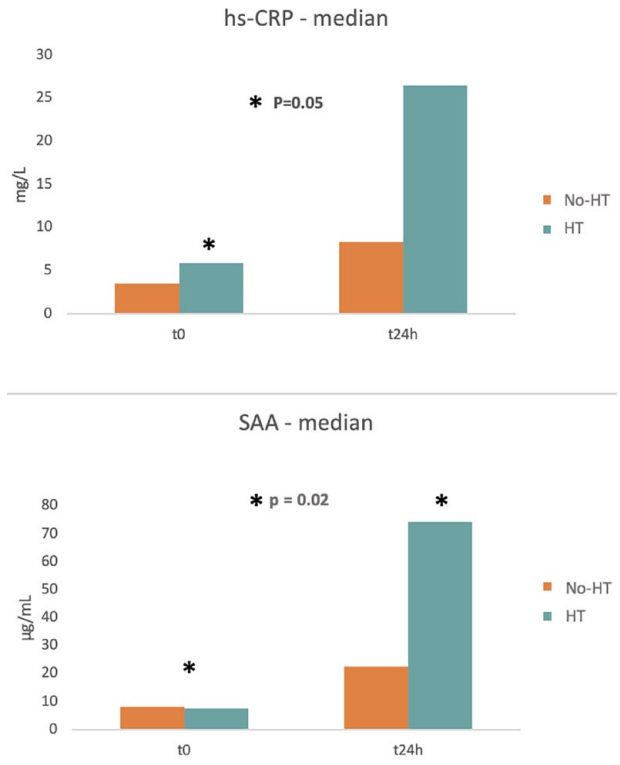
Background and aims: Haemorrhagic Transformation(HT) and Brain Edema(BE) represents the most feared complications of ischemic stroke(IS). In this study we planned to perform joint research on humans and animal stroke-model to investigate interactions between circulating and neuroimaging-biomarkers. In this preliminary analysis we aimed to evaluate the association between blood biomarker obtained from humans and the occurrence HT at 24-hours after stroke. Preclinical mouse model methods and preliminary results will be described in a dedicated abstract.
Methods: Ongoing monocentric prospective observational study conducted in Careggi University-Hospital enrolling patients with acute ($<$12hours) IS of anterior circulation irrespective of reperfusion therapies. Brain CTscan and blood samples were performed at baseline and 24-hours after onset. In this preliminary analysis we included the following serum biomarkers: Serum-Amyloid-A(SAA), alfa-2 macroglobuline, ultrasensitive CRP (hsCRP)), S100 and Neuron-Specific Enolase. The main outcome of the univariate logistic regression was occurrence of any HT
Results: Among the 142 patients included in the analysis (mean age 76.20$\pm$6.9, 44% women, mean baseline NIHSS=11.8), hsCRP and SAA obtained at baseline were significantly associated with the occurrence of HT within the first 24 hours (p=0.05 and p=0.02 respectively) [figure]. hsCRP and SAA baseline values significantly correlated with stroke severity, assessed by NIHSS on admission (p=0.02 and p=0.03 respectively).
Conclusions: Baseline serum level of hsCRP and SAA seems to be higher in patients with severe stroke and a promising predictor of HT. the completion of the enrollment, the execution of further analyzes and the study of the animal model could clarify and strengthen our preliminary results.



Disclosure of interest: No

CEREBROVASCULAR MANIFESTATIONS OF COVID-19 AND OTHER INFECTIONS

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PREVALENCE AND POST-COVID INCIDENCE OF MRI MARKERS OF CEREBROVASCULAR DISEASE IN HOSPITALIZED PATIENTS WITH COVID-19

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Background and aims: During the pandemic, patients with COVID-19 were reported to have an increased risk of ischemic stroke. We assessed the prevalence of silent cerebral ischemia and other MRI markers of cerebrovascular disease in COVID-19 patients and the occurrence of new lesions three months later.
Methods: CORONIS (CORONavirus and Ischemic Stroke) is an observational cohort study in adult hospitalized patients with COVID-19 and matched controls. Participants underwent questionnaires and brain MRI. MRI markers included ischemic (DWI+) lesions, previous infarction, microbleeds, white matter hyperintensities (WMH), intracerebral hemorrhage, meningeal and cranial nerve enhancements. MRI was repeated after three months in a subset of patients. The prevalence ratio of MRI markers of cerebrovascular disease was assessed with logistic regression adjusted for confounders (i.e., age, sex, hypertension, hypercholesterolemia, smoking).
Results: Between April 2021 and October 2022, 125 COVID-19 patients (median age 60 years, 40% female) and 48 controls were scanned. 27 patients (21.6%) had been admitted to an intensive care unit. COVID-19 patients had more WMH compared to controls (adjusted OR 3.46 [1.29-9.71]). DWI+ lesions were found in a single patient (1%). Prevalence of microbleeds did not differ between groups (28.8% in patients vs. 22.9% in controls). In 8 of 97 patients (8.2%) new lesions were observed three months later.
Conclusions: COVID-19 was associated with a higher prevalence of WMH but not with an increased risk of DWI+ lesions. MRI after three months revealed new lesions in about one of every ten patients, which might suggest an ongoing inflammatory process due to COVID-19.
Disclosure of interest: No

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Characterization of ischemic stroke in patients with infectious bacterial endocarditis: A systematic review and meta-analysis

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Background and aims: Ischemic stroke (IS) is a common complication of infectious bacterial endocarditis (IE). Our aim was to characterize the frequency, clinical and pathological features, and outcomes of patients with stroke due to infectious endocarditis.
Methods: We searched PUBMED from database inception to October 2022 for observational studies on patients with infectious endocarditis who had a stroke and did a meta-analysis.
Results: We included 108 studies with a total of 271,926 patients. Ischemic stroke occurred in 20,654 (12.0%) of 172,318 and haemorrhagic stroke in 4,460 (2.9%) of 157,354 patients. Mitral valve endocarditis compared to IE of other valves was most likely to cause stroke (28.7% of all mitral valve IE) and was detected in 60.7% of all strokes. In aortic valve IE ischemic stroke occurred in 21.7% and was detected in 44.5% of all strokes. Patients with infectious endocarditis with stroke compared to no stroke had a higher mortality (18% vs 12.5%).
Pathogens most frequently associated with IS were Enterococcus and Staphylococcus (17.1% and 16.8%). Staphylococcus or Streptococcus were most frequently detected in patients with IE with stroke (27.2% and 20.0%). Stroke occurred less frequently in patients on antiplatelet inhibitors or oral anticoagulation (11.0%) compared to those without antiplatelets or anticoagulation (14.1%).
Conclusions: Ischemic stroke occurs frequently in patients IS (12%) and is relevant to the outcome The comparably high association of enterococcal IE and stroke has not been reported previously. Specific data on stroke in IE patients from a neurological viewpoint is sparse and should be further investigated.
Disclosure of interest: No

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HIGH LEVELS OF CELL-FREE HEMOGLOBIN AND IRON IN CLOTS OF COVID-19 STROKE PATIENTS: NOVEL MECHANISM ASSOCIATED WITH THE SARS-COV-2 INDUCED PROTHROMBOTIC STATE

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Background and aims: The underlying mechanisms of COVID-19-associated hypercoagulability and thrombotic events are not fully defined. To increase knowledge on the pathogenesis for the increased clotting during SARS-CoV-2-infection, we analyzed the histological and ultrastructural characteristics and protein expression and metal composition of clots retrieved during mechanical thrombectomy from COVID-19-infected (n=6) and uninfected (n=6) stroke patients.

Methods: Histological composition and architecture of thrombi were determined by immunohistochemical staining and transmission electron microscopy, respectively. Clots were further subjected to comparative proteomics analysis by tandem mass spectrometry coupled to liquid chromatography (LC-MS/MS) using SWATH data-independent acquisition and total reflection X-Ray fluorescence (TXRF) evaluation for the presence of 13 metals. Demographic data vascular risk factors, clinical and radiological characteristics and hematological findings were recorded for each subject.

Results: No relevant differences in red blood cell, neutrophil and Neutrophil Extracellular Traps (NETs) content were found between COVID-19 clots and control clots however, thrombus samples from infected patients showed diffuse staining for CD68 (monocyte/macrophage marker), decreased platelet density, and random distribution of fibrin throughout the clot. Furthermore, TRXF and the quantitative proteomic analysis revealed significantly higher levels of iron, hemoglobin alpha, beta, gamma, and delta subunits, immunoglobulins, and redox signaling enzymes and lower expression of proteins involved in platelet activation/aggregation- in COVID-19 cases compared to controls. In addition, complements C1, C4, and C5 were only found in COVID-19 thrombi.

Conclusions: These findings provide interesting information on a possible new mechanism underlying thrombotic phenomena in COVID-19 disease, involving cell-free haemoglobin and iron.

Disclosure of interest: No

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STROKE OUTCOME IS WORSE IN PATIENTS DEVELOPING COVID-19 DURING ADMISSION THAN IN PATIENTS WHO ALREADY HAVE COVID-19 AT THE ONSET OF THEIR STROKE

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Background and aims: Active infection with COVID-19 at stroke onset results in more severe strokes with a worse outcome. Our objective was to see whether developing COVID-19 during hospital admission has a similar adverse influence over outcome.

Methods: We collected data from 24 hospitals in the UK. We compared three groups of patients admitted to hospital with stroke due to ischaemia or haemorrhage: those with COVID-19 at Stroke Onset (CSO), those who first developed COVID-19 During Admission (CDA) and those with No COVID-19 (NC). Categorical variables were compared using chi-square tests.

Results: The 2391 stroke patients reported included 220 CSO, 84 CDA and 2087 NC patients. The proportion of Asian patients in the CSO group (18.7%) was higher than in the NC group (8.4%, $p<0.001$). However, there was no statistically significant difference in the proportions of Asians in the CDA and NC groups (10.0% vs 8.4%, p=0.6). The proportion of patients with intracerebral haemorrhage was higher in the CDA group (21.4%) than in the CSO group (9.1%, p=0.004). The proportion who were dead or disabled (mRS 3-6) at the end of their admission was higher in the CDA group (83.1%) than in the CSO group (69.0%, p=0.01).

Conclusions: Patients developing COVID-19 during their admission had a particularly poor outcome, worse than in patients with COVID-19 at stroke onset, reinforcing the importance of protecting stroke inpatients from COVID-19. Patients admitted with intracerebral haemorrhage appear to be at particularly high risk of acquiring COVID-19 during admission.

Acknowledgements
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Disclosure of interest: No

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CEREBRAL HAEMODYNAMICS AMONG COVID-19 SURVIVORS WITH COGNITIVE IMPAIRMENT TWELVE MONTHS AFTER HOSPITAL DISCHARGE

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Background and aims: Neurologic sequelae are frequent among COVID-19 survivors, with cognitive impairment being the most frequent. Until now, the potential role of the cerebral microvascular alterations that these patients may develop and their role in this outcome remains unknown. Here we aim to assess the frequency and characteristics of cognitive impairment among COVID-19 survivors and the cerebral microvasculature alterations measured by transcranial Doppler ultrasound measured by cerebral vascular reactivity tests.
Methods: Cross-sectional study evaluating the cerebral haemodynamics of hospitalised COVID-19 survivors 12 months following hospital discharge. The study was conducted from March 1, 2021, to October 30, 2022. The cognitive evaluation was performed using the revised Addenbrooke´s cognitive assessment, and cerebral haemodynamics were evaluated by transcranial Doppler ultrasound (TCD) using the respiratory retention index (IRR) by voluntary apnoea test.
Results: In total, 279 patients were analysed, 122 female and 157 males (median age 55 years [IQR 45–64 years]); 30.1% developed cognitive impairment. Diabetes was more frequent among patients with cognitive impairment. There was no difference in the inflammatory or thrombotic inflammatory response biomarkers analysed. No differences were found in the measurements or the IRR. In a logistic regression model, the IRR was not associated with the development of cognitive impairment. The factors associated with this outcome included diabetes and the development of in-hospital delirium, with mechanical ventilation being a protective factor.
Conclusions: The frequency of cognitive impairment 12 months after hospital discharge is 30%. Alterations in cerebral vasoreactivity were not associated with cognitive impairment.

TABLES

Table 1. Cerebral haemodynamics

Variable	Total (N = 279)	No cognitive impairment (n = 195; 69.9%)	Cognitive impairment (n = 84; 30.1%)	*p*
RMCA MFV basal (cm/s)	46.91 (37–56)	44.67 (36.33–54.67)	49.33 (39.5–57.83)	0.047
Right PI basal	0.88 (0.76–0.98)	0.89 (0.77–1)	0.84 (0.72–0.94)	0.02
Right RI basal	0.56 (0.51–0.59)	0.56 (0.51–0.6)	0.54 (0.48–0.58)	0.02
RMCA MFV apnoea (cm/s)	60.33 (49.11–70.44)	58.67 (48.67–70.13)	61.67 (50.17–71.67)	0.376
Right IRR	0.92 (0.67–1.34)	0.98 (0.71–1.46)	0.84 (0.6–1.12)	0.008
Right % MFV change	27.7 (20.15–40.24)	29.46 (21.27–43.73)	25.28 (18.05–33.74)	0.008
ACMI VM basal (cm/s)	46.66 (37.23–56)	44.67 (36.86–55)	50.5 (42–56.83)	0.035
Left PI basal	0.84 (0.72–0.94)	0.85 (0.73–0.96)	0.82 (0.71–0.92)	0.279
Left RI basal	0.54 (0.49–0.58)	0.54 (0.49–0.59)	0.53 (0.48–0.57)	0.3
LMCA MFV apnoea (cm/s)	85 (70–102)	83 (67–100.75)	89 (75.23–102)	0.201
Left IRR	0.69 (0.35–1.13)	0.74 (0.32–1.2)	0.64 (0.39–1.09)	0.519
Left % MFV change	20.74 (10.6–33.76)	22.06 (9.65–36)	19.35 (11.78–32.82)	0.519
Global % MFV change	26.08 (17.48–35.03)	27.43 (17.74–39.78)	22.68 (17.28–30.83)	0.067
Altered IRR, n (%)	96 (34.4)	61 (31.3)	35 (41.7)	0.094

Abbreviations: IRR, respiratory retention index; MCA, middle cerebral artery; PI, pulsatility index, RI, resistance index; MFV, mean Flow velocity.

Table 2. Logistic regression results.

	OR (95% CI)	*p*	aOR (95% CI)	*p*
Female sex	0.86 (0.51–1.43)	0.551	0.77 (0.43–1.39)	0.389
Age ≥ 55 years	2.45 (1.45–4.12)	< 0.001	0.55 (0.29–1.02)	0.059
Diabetes	1.89 (1.06–3.37)	0.3	2.23 (1.18–4.21)	0.014
PaO_2/FiO_2, mmHg	1.0 (0.99–1.1)	0.322	0.99 (0.99–1.01)	0.279
N-L index ≥ 9	1.11 (0.67–1.85)	0.686	1.25 (0.65–2.39)	0.501
Invasive mechanical ventilation	0.67 (0.35–1.27)	0.217	0.12 (0.03–0.44)	0.001
Delirium	1.86 (0.98–3.54)	0.057	8.34 (2.26–30.85)	0.001
Altered IRR	1.57 (0.93–2.66)	0.095	1.24 (0.66–2.33)	0.504

Abbreviations: IRR, respiratory retention index; N-L, neutrophil to lymphocyte.

Disclosure of interest: No

CEREBROVASCULAR MANIFESTATIONS OF COVID-19 AND OTHER INFECTIONS

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INTRACRANIAL VESSEL WALL ENHANCEMENT AFTER COVID-19 INFECTION

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Background and aims: COVID-19 is associated with an increased risk of ischemic stroke. Inflammation of intracranial vessels could be a potential underlying cause. We aimed to investigate the frequency of intracranial vessel wall enhancement on MRI as a possible sign of inflammation in patients with subacute COVID-19 infection.
Methods: We included hospitalized patients with COVID-19 with or without clinically overt stroke from the prospective CORonavirus and Ischemic Stroke (CORONIS) cohort study. 3T MRI including vessel wall imaging was performed within 3 months after positive PCR and repeated 3 months later. We assessed the frequency of vessel wall enhancement and assessed possible risk factors with univariate logistic regression analyses.
Results: 128 patients (6 with ischemic stroke) were included at a median of 41 days after infection. Mean age was 58 years and 60.2% was male. Thirty-four (28%) patients without stroke and three patients (50%) with stroke had vessel wall enhancement on MRI. In 4 patients multiple sites of vessel wall enhancement were found. Of 41 enhancing lesions, 23 were located at a site with other vessel wall abnormalities (atherosclerosis, stenosis/occlusion, irregularities) on pre-contrast T1. After 3 months 5 new sites of enhancement had developed and one had disappeared. Male sex (OR: 3.25 95%CI: 1.34-7.86), age (OR: 1.08 95%CI: 1.03-1.12), hypertension (OR: 3.30 95%CI: 1.49-7.29), hyperlipidemia (OR:3.47 95%CI: 1.56-7.69) and history of stroke or TIA (OR: 5.68 95%CI: 1.34-24.09) were associated with vessel wall enhancement.
Conclusions: Intracranial vessel wall enhancement is frequently present in patients with COVID-19 with or without stroke.
Disclosure of interest: No

ATHEROSCLEROSIS & STROKE

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Morphological features of intracranial atherosclerotic disease are associated with the recurrence of ischemic stroke

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Background and aims: Stroke in Chinese is unique, in which intracranial arterial disease (ICAD), rather than extracranial carotid stenosis, accounts for the pathophysiology. The hospital-based study aimed to explore the clinical relevance of morphological features of ICAD evaluated by high-resolution magnetic resonance imaging (HRMRI) in Chinese stroke patients.
Methods: Consecutive patients with acute ischemic stroke were included. Bilateral middle cerebral artery (MCA), vertebral artery (VA) and the basilar artery (BA) were examined to identify the presence of arterial lesions. Three-tesla MRI was used to do vessel wall imaging before and after contrast administration. Vascular stenosis, plaque burden, plaque eccentricity and plaque enhancement index and signal intensity were assessed. Regular follow-up was performed within one year after stroke onset.
Results: A total of 132 patients were included with 293 ICAD lesions (86 symptomatic, 207 asymptomatic) identified in intracranial arteries. Symptomatic ICAD had higher degree of stenosis (73.75±18.27% vs. 61.78±21.07%, $p<0.001$) and plaque burden (84.82±10.58% vs. 77.48±11.58%, $p<0.001$) compared to asymptomatic ICAD. The prevalence of eccentric plaque in symptomatic ICAD was slightly higher than that in asymptomatic ICAD (70.9% vs. 59.9%, p=0.075). The enhancement index were similar between symptomatic and asymptomatic lesions. During 1-year follow-up, 11 patients had recurrent stroke. Hyperintensive signal was found less prevalent in ICAD in patients with recurrent stroke (11.5% vs. 35.2%, p=0.014).
Conclusions: Luminal stenosis and morphological features of individual lesions may play a synergetic effect on the occurrence and recurrence of stroke.
Disclosure of interest: No

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The Association Between Bone Mineral Density and Intracranial Atherosclerosis in Stroke Patients

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Background and aims: Intracranial internal carotid artery calcifications (ICAC) are a common radiologic finding in ischemic stroke. A relationship between poor bone health and atherosclerosis has been documented for various vascular beds in the body including the extracranial ICA, coronary arteries, and aorta. Herein, our aim was to determine whether a similar interplay exists for the intracranial vasculature, primarily from the perspective of carotid arteries.
Methods: A consecutive series of acute ischemic stroke patients (n=250, 46% female) were prospectively enrolled in the study. The presence and type of intracranial ICAC on both sides were evaluated on admission CT-angiography source images. Bone mineral density measurements were performed from the femoral region, and its association with intracranial ICAC was evaluated by univariate and multivariate analyses.
Results: A total of 65 (26%) patients had no calcifications, while 102 (41%) had predominantly intimal, 48 (19%) had predominantly medial and 35 (13%) had a mixed calcification pattern. Older age and history of diabetes mellitus were consistently associated with any type of calcifications. A lower femoral bone T-score was associated with intimal calcifications (OR 0.67; 95%CI 0.47-0.95; p=0.026), when adjusted for age and cardiovascular risk factors. No association of bone mineral density measures was evident for other types of calcifications.
Conclusions: A low femoral T-score was significantly associated with presence of intimal-type intracranial ICAC, but not with medial-type calcifications. Our findings extend previous observations highlighting the relationship between poor bone health and atherosclerosis to the intracranial carotid artery system. *(The study was funded by TUBITAK grant-218S753)*
Disclosure of interest: No

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PROINFLAMMATORY BIOMARKERS LEVEL IN PATIENTS WITH CAROTID ATHEROSCLEROTIC STENOSIS

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Background and aims: Inflammatory activity is integral indicator of the development of carotid atherosclerosis and its complications. Inflammatory factors such as adhesion molecules participate in induction of atherosclerotic disease. Lipoprotein-associated phospholipase A2 (Lp-PLA2) also one of the markers of inflammatory activity in atherosclerosis.
Aims - to evaluate serum level biomarkers of atherosclerosis E-selectin and association with Lp-PLA2 in patients with carotid atherosclerotic stenosis (CAS) with different clinical manifestation
Methods: 106 patients with CAS (74 men and 32 women, mean age 62.6±0.9) were included: with acute ipsilateral atherothrombotic stroke (35), history of stroke and carotid endarterectomy (41) and 30 with asymptomatic CAS. The control group consist of 20 health subjects. All participants underwent duplex sonography. E-selectin and Lp-PLA2 was measured using commercially available (ELISA) kit.
Results: The level of E-selectin in the study patients was significantly higher 7.653±0.246 pg/ml than in the control group 3.101±0.503 pg/ml, $p<0.05$. The level of Lp-PLA 2 in patients was significantly higher 55.664± 3.537 ng/ml than in the control group 9.296± 0.935 ng/ml, $p<0.05$. The correlation of Lp-PLA2 with E-selectin, was significant (R=0.365664, p=0.00085). The logistic regression model showed that combination of E-selectin and Lp-PLA2 allows to predicting the stroke development with 70 % of the accuracy in patients with CAS.
Conclusions: The level of E-selectin in study patients was significantly higher than in control group. Study show that the levels of E-selectin and Lp-PLA2 have a significant impact on the development of stroke in patients with CAS and can be used to predict it.
Disclosure of interest: No

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Albumin-globulin ratio and common carotid artery intima-media thickness in patients with ischemic stroke

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Background and aims: The relationships between serum albumin, albumin-globulin (A/G) ratio, globulin and atherosclerosis in the setting of ischemic stroke are unclear. We aimed to evaluate the associations between serum albumin, A/G ratio, globulin levels and carotid atherosclerosis in patients with ischemic stroke.
Methods: A total of 1,339 ischemic stroke patients were enrolled. Admission A/G ratio was divided into quartiles, and serum albumin and globulin levels were also categorized. Carotid atherosclerosis was identified by measurement of common carotid artery intima-media thickness (cIMT), and abnormal cIMT was defined as having a mean cIMT and maximum cIMT value⩾1 mm. Multivariable logistic regression models were used to assess the relationships between A/G ratio, albumin, globulin and abnormal cIMT.
Results: In the multivariable-adjusted analysis, the highest A/G ratio quartile (Q4) was associated with a 59% (OR 0.41; 95% CI 0.29-0.60) decreased risk of having abnormal mean cIMT and 58% (OR 0.42; 95% CI 0.30-0.60) decreased risk of having abnormal maximum cIMT in comparison to Q1, respectively. Moreover, decreased albumin and increased globulin levels were associated with abnormal mean cIMT and maximum cIMT. In addition, the A/G ratio provided incremental predictive capacity beyond established risk factors, and the C-statistic of A/G ratio for abnormal cIMT is larger than globulin ($P<0.01$).
Conclusions: Decreased serum A/G ratio, albumin and elevated serum globulin were independently associated with abnormal cIMT in patients with ischemic stroke. Moreover, the A/G ratio appeared to be a better predictor of abnormal cIMT.
Disclosure of interest: No

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SYSTEMIC INFLAMMATORY MARKERS ASSOCIATED WITH PROGRESSION OF SYMPTOMATIC INTRACRANIAL ATHEROSCLEROTIC STENOSIS UNDER MEDICAL TREATMENT

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Background and aims: Patients with symptomatic intracranial atherosclerotic stenosis (sICAS) have a considerable risk of recurrent stroke or lesion progression despite medical treatment. We aimed to investigate the associated blood biomarkers.
Methods: Patients with 50-99% sICAS confirmed by CT angiography (CTA) at baseline, who were scheduled for a follow-up CTA at 1 year, were enrolled. All patients received guideline-recommended medical treatment. We analyzed the associations of complete blood counts, blood lipids and chemistry markers at baseline and during follow-up, with sICAS progression, defined as recurrent relevant ischemic stroke/transient ischemic attack (TIA) within 1 year, or an increase in luminal stenosis by >10% on 1-year versus baseline CTA. Sensitivity analyses were conducted in patients without stroke/TIA recurrence.
Results: Among 55 patients, 15 (27.3%) patients had sICAS progression within 1 year, 9 with stroke/TIA recurrence and 6 with increased luminal stenosis only. Baseline level of none of the blood biomarkers was associated with sICAS progression. However, mean levels of white blood cell (adjusted odds ratio 2.69, 95% confidence interval 1.24-5.84), neutrophil (6.61, 1.83-23.84), neutrophil/lymphocyte ratio (3.95, 1.55-10.04), monocyte (2.26, 1.01-5.06) and high-density lipoprotein (0.41, 0.18-0.96) during follow-up were independently associated with sICAS progression. Sensitivity analyses showed positive linear correlations of mean neutrophil and monocyte levels during follow-up with change in the percent luminal stenosis over 1 year.
Conclusions: The findings indicated the potential effects of long-term systemic inflammation on stroke relapse or lesion progression in sICAS, which could be a new therapeutic target, on top of the current secondary prevention regimens.
Disclosure of interest: No

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Higher pulse wave velocity ratio is independently associated with ischemic stroke due to large artery atherosclerosis

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Background and aims: Increased pulse wave velocity (PWV), a marker of arterial stiffness, is a risk factor and prognostic factor of ischemic stroke. PWV is also associated with carotid artery atherosclerosis. Previous studies on difference in PWV between etiological types of ischemic stroke are inconsistent. Moreover, there are no data on differences of a newly described aortic-brachial stiffness ratio in ischemic stroke subgroups. The aim of our study was to compare PWV and PWV ratio between subjects with ischemic stroke due to large artery atherosclerosis (LAA) and non-LAA ischemic stroke patients.
Methods: Carotid-femoral PWV (cfPWV) and carotid-radial PWV (crPWV) were measured using SphygmoCor® device in ischemic stroke subjects at day 6 ($\pm$2) of hospitalization in Department of Adult Neurology, Gdańsk, Poland. PWV ratio was defined as cfPWV/crPWV. Appropriate diagnostic investigations were performed to determine the aetiology of ischaemic stroke.
Results: In the recruited 188 patients, aged 62.4$\pm$12.0 years, 66% males, National Institutes of Health Stroke Scale (NIHSS) score of 5 (3–8), 41 (21.8%) had stroke due to LAA. In the univariate analysis, patients with LAA had higher cfPWV (11.5m/s vs. 10.1m/s, p=0.01) and PWV ratio (1.37 vs. 1.17, $p<0.01$) than non-LAA patients. crPWV was similar in the analysed groups (8.6m/s vs. 8.8m/s, p=0.54). After adjustment for confounders, including sex, baseline NIHSS score, systolic blood pressure, higher PWV ratio, but not cfPWV, remained significantly associated with stroke due to LAA (OR:2.90, 95%CI:1.09–7.73, p=0.03).
Conclusions: Higher PWV ratio, but not cfPWV, is independently associated with ischemic stroke due to LAA.
Disclosure of interest: No

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Novel targets for molecular imaging of inflammatory processes of carotid atherosclerosis: a systematic review

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Background and aims: Conventional neuroimaging and 18F-fluorodeoxyglucose (18F-FDG) positron emission tomography (PET) have known clinical value when evaluating patients with carotid atherosclerosis. In this systematic review, we will focus on the role of novel molecular imaging tracers in that assessment and their additional strengths to stratify stroke risk.
Methods: We systematically searched PubMed, Embase, the Web of Science Core Collection and Cochrane Library for articles reporting on molecular imaging to non-invasively detect or characterize inflammation in carotid plaques in relation to atherosclerosis. We summarized and mapped the selected studies to provide an overview of the current clinical development in molecular imaging in relation to risk factors, imaging and histological findings, diagnostic and prognostic performance and treatment.
Results: We identified 31 articles in which the most utilized tracers to visualize carotid wall inflammation were ultrasmall superparamagnetic iron-oxides (USPIO's) (n=11), somatostatin subtype-2 (SST2)- (n=5), CXC-motif chemokine receptor 4 (CXCR4)- (n=3), choline (n=2), translocator protein (TSPO)- (n=2) and aVβ3 integrin-ligands (n=2). Tracer uptake correlated with traditional cardiovascular risk factors. We identified discrepancies between tracer uptake and grade of stenosis, plaque calcification and FDG uptake, which could suggest added value. Immunohistochemical analysis linked tracer uptake to markers of macrophage infiltration and neovascularization. Some trials advocated a promising role of molecular imaging as a specific intermediary (bio)marker for outcome.
Conclusions: Molecular imaging using USPIO, SST2-, TSPO- and choline-ligands show promise for identification of high-risk plaque inflammation. These tracers may become possible candidates for larger prospective longitudinal outcome studies to monitor disease activity and treatment response.
Disclosure of interest: No

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Density of carotid plaque calcifications and vulnerable plaque in patients with embolic stroke of undetermined source

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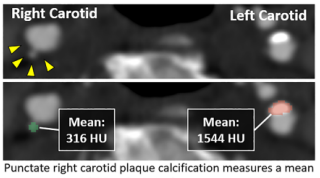
Background and aims: Despite the ubiquity of calcifications in carotid plaque, features leading to plaque vulnerability are unclear. Dense ossified versus faint mineralizing calcifications may be stabilizing versus destabilizing, respectively. Associations between degree of plaque calcification densities with intraplaque hemorrhage (IPH) in patients with embolic stroke of undetermined source (ESUS) were investigated.
Methods: Carotid bifurcation calcific plaques were identified on neck CTAs from a retrospective dataset comprised of patients meeting criteria for ESUS and with unilateral anterior circulation stroke. Using 3D-Slicer and blinded to stroke side, each plaque calcification was manually segmented to measure mean attenuation coefficients (Hounsfield Units, HU_{calc_mean}; Figure). Semi-automated plaque segmentation software (Elucid Bioimaging) quantified IPH volumes. Spearman's rank correlation coefficients tested IPH_{vol} and HU_{calc_mean} correlations. Linear regression and McNemar tests examined associations between IPH_{vol} and plaque calcification counts (calcification-cluster) with respect to stroke side.
Results: Thirty-nine CTAs (N=78 carotid arteries; N=17 women; age_{mean}=70.1years) met criteria. Per-calcification analysis revealed a negative correlation between IPH_{vol} and plaque calcification HU_{calc_mean} (r=-0.19, p=0.01). Scatterplot analysis suggested a threshold inflection point between 200-400HUs with increasing IPH_{vol}. Calcifications measuring ⩽200HU-500HU showed significant correlations with IPH_{vol} (Table). Per-plaque analyses showed associations between IPH_{vol} and larger calcification-clusters measuring ⩽300HU (p=0.01) and ⩽400HU (p=0.04). IPH_{vols} were different between carotid plaques ipsilateral versus contralateral to stroke side with and without calcifications measuring ⩽300HU (p=0.006).
Conclusions: Calcifications measuring ⩽$300HU_{calc\_mean}$ and calcification-clusters in carotid plaques were associated with higher IPH_{vol} in patients with ESUS and may be an imaging biomarker for vulnerable plaque.

Figure: CTA Neck with Examples of Carotid Plaque Calcifications of Different Attenuation Coefficients



Punctate right carotid plaque calcification measures a mean Hounsfield Unit (HU_{mean}) of 316 (green segmentation) compared to a left carotid plaque calcification with 1544 HU_{mean} (rose segmentation). Note a subtle suggestion of noncalcified soft plaque around the right carotid calcification (yellow arrowheads).

Table: Correlation Analyses of Plaque Calcification Attenuation Coefficients and Plaque Intraplaque Hemorrhage Volume

Plaque Calcification Attenuation Coefficient (HU)	Spearman's Correlation Coefficient	P-value
≤200HU	0.40	0.005**
≤300HU	0.29	0.02*
≤400HU	0.20	0.05*
≤500HU	0.18	0.05*
≤600HU	0.05	0.57

Abbreviations: HU, Hounsfield Units.
** p<0.01; *p≤0.05

Disclosure of interest: No

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Background Plaque Inflammation Assessed by Positron Emision Tomography is Associated with Progression of Asymptomatic Carotid Stenosis

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Background and aims: For patients with asymptomatic carotid stenosis ⩾60%, carotid revascularization may be considered in the presence of complementary markers of vulnerability. Stenosis progression is a well-known marker of increased risk of late stroke. We hypothesized that plaque inflammation imaged by ^{18}F-fluorodeoxyglucose positron emission tomography (^{18}FDG-PET) was associated with the risk of progression.
Methods: Prospective study of consecutive patients with a recent ischemic stroke/TIA and carotid stenosis (2016-2019). Participants underwent carotid ^{18}FDG-PET/CT ⩽14 days after recruitment. For the present analysis we identified patients with contralateral asymptomatic

carotid stenosis (30-99%). The whole-vessel average of each standardized uptake value (WV-SUV) of the internal carotid artery measured over fifteen slices (1mm), was calculated. We studied the association between the WV-SUV and the risk of progression during the follow-up, defined as an increase of at least one category by doppler or CT-angiography: mild (<50%), moderate (50-69%), severe (70-99%) and occlusion (100%). Multivariable logistic regression analysis was performed.

Results: We included 57 patients (mean age 73.2±10.3 years, 13 [22.8%] were women). There were 13 patients with an asymptomatic stenosis ⩾50% and the remainder presented mild stenosis. After a median follow-up of 18 months (IQR 12-36), information about plaque progression was available for 50 patients and 10 (20%) presented progression. Baseline inflammation was higher in these patients (median WV-SUV=2.4[2.2-2.9] vs. 2.1[1.8-2.4] g/mL; p=0.039). In multivariable logistic regression analysis WV-SUV was independently associated with the risk of stenosis progression.

Conclusions: Plaque inflammation is associated with the risk of progression of asymptomatic carotid stenosis.

Disclosure of interest: No

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Intracranial atherosclerotic plaque and wall enhancement as a marker of arterial inflammation according to circulating monocyte populations

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Background and aims: Intraplaque post-contrast enhancement (PCE) on high-resolution magnetic resonance imaging (HR-MRI) could help stratify patients' risk of patients with intracranial atherosclerotic disease (ICAD). It unclear whether PCE is related to the inflammatory activity within the intracranial plaque. We aimed to analyze whether plaque and wall PCE is related to the circulating monocyte populations, focusing on the proportion of monocytes expressing CCR5 receptor, which allows them penetrate into the atheromatous lesions.

Methods: Designed a prospective, longitudinal including symptomatic ICAD and asymptomatic subjects with a very-high vascular risk. Participants underwent artery-wall HR-MRI and flow cytometry performed on fresh blood samples. Repeating after 3 months in symptomatic subjects. Subjects were classified according to the presence of enhancement in: no enhancement, arterial wall enhancement, and plaque enhancement. Flow cytometry identify monocyte populations Mon1, Mon2 and Mon3, using the markers CD14, CD16, HLA-DR, CCR2 and CCR5.

Results: We included 12 symptomatic ICAD and 34 asymptomatic subjects. All symptomatic and 53% of asymptomatic subjects showed intracranial plaque and/or arterial wall PCE. Symptomatic showed a higher proportion of Mon2 and Mon3 expressing CCR5+. Among asymptomatic, a higher proportion of Mon3 CCR5+ was observed in those showing intraplaque or wall enhancement. Participants with intraplaque or wall enhancement had a higher proportion of Mon3 CCR5+ than those with no enhancement. A significant correlation was found between Mon3 CCR5+ proportion and the number of intracranial arteries showing wall enhancement.

Conclusions: Intracranial plaque and artery-wall PCE is associated with a higher proportion of monocytes expressing CCR5 in ICAD patients.

Disclosure of interest: No

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Carotid endarterectomy and the risk of perioperative stroke

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Background and aims: Perioperative stroke is a known complication of carotid endarterectomy (CEA). We aimed to investigate the risk factors of perioperative ischemic cerebrovascular symptoms (iCVE) in carotid stenosis (CS) patients undergoing CEA in a large tertiary center.

Methods: HeCES2 (Helsinki Carotid Endarterectomy Study 2) is a cross-sectional longitudinal prospective and consecutive study of symptomatic or asymptomatic CS patients scheduled for CEA.

Results: Of all 488 operated CS patients 33 (4%) had an iCVE of which 21 (2%) suffered a stroke. Amaurosis fugax (AFX) as the index symptom (1/3%, p=0.028) was associated with fewer perioperative iCVEs (p=0.028) whereas stroke (14/42%, p=0.069) predicted iCVEs. Severe contralateral stenosis (6/18%, p=0.020) was also associated with perioperative iCVEs. Naive antithrombotic medication users had less perioperative iCVEs (226/48%, p=0.104) whereas any change in antithrombotic medication predicted more perioperative iCVEs (11/73%, p=0.015). In Cox regression analysis, severe contralateral stenosis (OR 3.21, 95%CI 1.28-8.03), left-sided CEA (OR 2.67, 95%CI 1.24-5.71), medication change (OR 2.42, 95%CI 1.16-5.07), history of coronary heart disease (OR 2.29, 95%CI 1.08-4.89) and ischemic stroke as an index symptom (OR 2.45, 95%CI 1.19-5.05) were independent predictors of perioperative iCVE.

Conclusions: As shown in earlier studies, severe contralateral stenosis, coronary heart disease, ischemic stroke as an index symptom and left sided CEA are risk factors for perioperative iCVEs. As a new finding, a change in the antithrombotic medication prior to CEA was associated with the risk of perioperative iCVEs. Studies on the timing of antithrombotic medication implementation and changes prior to CEA may be warranted.

Disclosure of interest: No

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ACCURACY OF DIAGNOSTICS OF VULNERABLE AND STABLE ATHEROSCLEROTIC PLAQUE IN CAROTID ARTERIES USING NONINVASIVE IMAGING METHODS COMPARED TO HISTOLOGY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and aims: Carotid atherosclerosis is responsible for up to 30% of all stokes. The aim of the study was to estimate accuracy of diagnostics of vulnerable and stable plaque using noninvasive imaging methods (ultrasound – US, computed tomography – CT, magnetic resonance imaging – MRI) when compared to histology in adult patients with symptomatic and asymptomatic carotid plaques.
Methods: We searched Medline Ovid, Embase, Cochrane Library Wiley, and Web of Science, supplemented by Google Scholar search and citation searching of key studies without any search limitation, for diagnostic accuracy of noninvasive imaging methods in the detection of 1) vulnerable/stable plaque, and 2) vulnerable/stable plaque characteristics compared to the gold standard of histology.
Results: We included 36 vulnerable plaque and 5 stable plaque studies in our diagnostic test accuracy meta-analysis, and of 208 plaque characteristics from remaining studies, we classified 166 as vulnerable and 42 as stable characteristics (overall 28 CT, 118 MRI, 103 US studies). In the univariate meta-analyses, we found that MRI has a higher accuracy (90%; 95% confidential interval [CI]: 82–95%) in diagnostics of vulnerable plaque compared to CT (86%; 95% CI: 76–92%) and US (80%; 95% CI: 75–84%) but the differences did not reach statistical significance. CT has a non-significantly higher diagnostic accuracy to visualize characteristics of vulnerable or stable plaques (89%/90%) compared to MRI (86%/89%) but significantly higher compared to US (77%/82%; $p<0.05$).
Conclusions: CT and MRI are comparable methods for vulnerable and stable plaque diagnostics.
Disclosures: Supported by grants NV19-04-00270/NU22-04-00389/SGS11/LF/2022/SGS18/LF/2022.
Disclosure of interest: No

ATHEROSCLEROSIS & STROKE

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Underlying ICAD is associated with worse outcomes in acute large vessel occlusion after thrombectomy

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Background and aims: Data on large vessel occlusion (LVO) management due to underlying intracranial atherosclerotic disease (ICAD) are scarce. We hypothesized that patients with ICAD have worse clinical outcomes following mechanical thrombectomy (MT) than those without ICAD.
Methods: We performed a retrospective analysis of consecutive patients who underwent MT for LVO in an academic comprehensive stroke center. We compared in-hospital and 90-day mortality, and 90-day modified Rankin Scale (mRS) scores between those with and without ICAD, in unadjusted and adjusting logistic regression models.
Results: Among 215 patients (mean age 67.1±16.0 years; 60.5% female; 80.5% Black, median NIHSS score 16), ICAD was present in 38 patients (17.7%). Diabetes and dyslipidemia were more common in those with ICAD (57.9% vs. 38.4%, p=0.027 and 29.0% vs. 14.7%, p=0.035, respectively). Substantial reperfusion (TICI ⩾2b) was achieved less often (84.2% vs. 94.4%, p=0.031) but symptomatic ICH was also less common in ICAD patients (0% vs. 9.0%, p=0.054). In-hospital and 90-day mortality were more common (36.8% vs. 15.8%, p=0.003 and 52.6% vs. 26.6%, p=0.002, respectively) and favorable functional outcome (mRS 0-2) at 90 days was less common (7.9% vs. 33.9%, p=0.001) in ICAD patients. After adjusting variables, ICAD was independently associated with in-hospital mortality (OR=4.1, 95% CI 1.7-9.7), 90-day mortality (OR=3.7, 95% CI 1.6-8.6), and poor functional outcome at 90 days (OR=5.5, 95% CI 1.6-19.4).
Conclusions: Symptomatic ICAD in a predominantly African American cohort is associated with increased odds of mortality and poor functional outcome at 90 days in patients with LVO undergoing MT.
Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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Characterization of ischemic stroke in patients with bacterial meningitis: A cohort study and meta-analysis

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Background and aims: Cerebrovascular complications contribute to worse outcomes after bacterial meningitis. However, the pathophysiological background and characteristic findings are not well understood. Hence, we aimed to characterize clinical, imaging, and laboratory features of patients with bacterial meningitis with stroke.

Methods: In a single-center retrospective study, we analyzed 102 patients with bacterial meningitis of which 19 had ischemic stroke. Additionally, we searched PUBMED for studies on stroke in patients with bacterial meningitis, and performed a meta-analysis to investigate the frequency and timing of stroke as well as its effect on mortality.

Results: In our cohort, 15 (78.9%) patients with stroke had an mRS $\geqslant$3 at discharge compared to 33 (39.8%) in patients without stroke ($p<0.01$). Of 1,692 patients with bacterial meningitis from 15 cohort studies included in our meta-analysis, cerebral infarcts were found in 332 (16%; 95%CI 0.13-0.20) patients. The occurrence of stroke was strongly associated with a higher mortality (OR2.38; 95%CI 1.70-3.34; $p<0.0001$). There was no association of any specific causative pathogen with the occurrence of stroke. Infarcts were mainly distributed in territories of arteries located in the vicinity to the infection focus and peaked at 3-7 days and 2 weeks after meningitis. In patients with stroke vasculitis was found in 52.6% and additional intracerebral hemorrhage in 21.1%.

Conclusions: This study found that stroke due to bacterial meningitis is caused by an inflammatory stimulus to the brain vessels located in the vicinity of the infection focus, and that the time course of infarctions might enable a therapeutic intervention.

Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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MASS-SPECTROMETRIC EXPLORATION OF BRAIN BIOPSY PROTEOME IN PATIENTS WITH PRIMARY CNS VASCULITIS

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Background and aims: Primary CNS Vasculitis (PCNSV) is a rare inflammatory condition which severely affects vessel walls of the brain, spinal cord & meninges. There are no specific diagnostic biomarkers with brain biopsy being gold standard. We aim to identify differentially expressed proteins in CSF, brain tissues and blood samples using mass spectrometry (MS) analysis.

Methods: We performed an unbiased discovery phase proteomic analysis using MS comparing the brain biopsy profiles of patients with PCNSV (n=3) and autopsy controls (n=4).

Results: A total of 1,995 proteins were identified where 466 proteins had statistically significant differential regulations in PCNSV, with 208 upregulated and 258 downregulated proteins with fold change >2 & $p<0.05$. Pathway enrichment analysis showed significant enrichment of processes involving mitochondrial electron transport and the KEGG pathways. Complement protein, C3 was found to be significantly upregulated in PCNSV patients. Apart from C3, other significantly altered proteins include CLU, A2M, SERPING1, MAPK1, IGHG, IGHM, SEPTIN2. Also, the enrichment for cell adhesion molecules were found to be altered by proteins like NRCAM, PTPRF & APP which were significantly downregulated in PCNSV individuals compared to controls.

Conclusions: Based on our preliminary findings in brain biopsy samples, some novel proteins are found significantly dysregulated in PCNSV and need to be further validated in CSF and blood samples. Involvement of complement protein, C3 is novel in addition to previously reported CSF proteomic study by Caleigh Mendel (2019) suggesting the role of alternative complement pathway in the pathogenesis of PCNSV.

Funding: ICMR, Government of India

Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

939

Stroke in patients with benign gynecological diseases: A multicenter study in Japan

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Background and aims: Gynecological diseases such as uterine fibroids, endometriosis, and adenomyosis are common in women of reproductive age. Case reports and small case series have reported ischemic stroke in women with such benign gynecological diseases. However, stroke etiology and prognosis are not well known. The aim was to assess the stroke

mechanisms related to benign gynecological diseases using hospital-based clinical data.
Methods: We retrospectively identified consecutive female patients with benign gynecological diseases diagnosed with ischemic stroke/transient ischemic attack (TIA) between the ages of 20 and 59 years admitted to 10 stroke centers in Japan between 2017 and 2019. The clinical features were compared between patients with conventional stroke mechanisms (CSMs) (large-artery atherosclerosis, small-vessel occlusion, cardioembolism, and other determined etiology) and non-CSMs (cryptogenic and causes related to hypercoagulability such as nonbacterial thrombotic endocarditis and paradoxical embolism).
Results: Of the 470 female patients with ischemic stroke/TIA, 39 (8%) (37 ischemic stroke and 2 TIA) had benign gynecological diseases. Twenty patients (51%) were assigned to the non-CSMs group, and 19 patients (49%) were assigned to the CSMs group. Adenomyosis and endometriosis were more frequent in the non-CSMs group than in the CSMs group ($p<0.05$). CA125 ($p<0.05$) and D-dimer ($p<0.05$) levels were higher in the non-CSMs group than in the CSMs group. No stroke recurrence or death was observed within 3 months after discharge in both the CSMs and non-CSMs groups.
Conclusions: In patients with benign gynecological diseases, hypercoagulopathy may play a role in the pathogenesis of ischemic stroke/TIA without CSMs.
Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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Predictors of acute symptomatic seizures in cerebral venous thrombosis patients – A multicenter cohort study

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Background and aims: Patients with cerebral venous thrombosis (CVT) occasionally experience acute symptomatic seizure (ASS). We aimed to identify predictors for ASS in CVT patients.
Methods: Prospective CVT databases from three academic centers were retrospectively analyzed. CVT patients with and without ASS within seven days from presentation were compared.
Results: Out of the 404 included patients (mean age 41.8 years, 33% male), 90 (22.2%) had ASS. CVT patients with ASS had higher rates of focal neurological deficits (48% vs. 24%, $p<0.001$) and chronic hypertension (16% vs. 7%, $p = 0.036$) but lower rates of headache (67% vs. 86%, $p<0.001$) and papilledema (15% vs. 30%, $p<0.007$) at presentation. Radiological variables associated with ASS included superior sagittal sinus (SSS) thrombosis (59% vs. 35%, $p<0.001$), isolated cortical vein thrombosis (25% vs. 9%, $p<0.001$), presence of intracerebral hemorrhage (ICH) (47% vs. 10%, $p<0.001$) and venous infarction (34% vs. 6%, $p<0.001$). ASS patients had lower rates of favorable outcomes, as measured by 90-day-mRS 0-1 (82% vs. 92%, $p < 0.001$).
On multivariate analysis, ICH (OR 5.278, 95%CI 2.8-10, $p = 0.001$), SSS involvement (OR 2.48, 95%CI 1.37-4.5, $p = 0.003$) and isolated cortical thrombosis (OR 2.08, 95%CI 1-4.52, $p = 0.05$), were independent predictors of ASS. Conversely, presentation with either papilledema (OR 0.44, 95%CI 0.2-0.95, $p = 0.039$) or headache (OR 0.51, 95%CI 0.26-0.98, $p = 0.046$) were negative predictors for ASS.
Conclusions: ASS has unique clinical and radiological predictors in CVT patients suggesting a different course of disease and required treatment paradigm.
Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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ASSOCIATION BETWEEN SMOKING AND CRYPTOGENIC ISCHEMIC STROKE IN YOUNG ADULTS

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Background and aims: In this prospective SECRETO case-control study, we aimed to explore the association between smoking and young-onset cryptogenic ischemic stroke (CIS), with subgroup analyses stratified by sex and age.
Methods: We enrolled 509 patients aged 18-49 years (median age 41 years; 47% women) with a recent CIS and 509 age- and sex-matched ($\pm$5 years) stroke-free controls. We explored the CIS risk for current smoking, per 5 years of smoking, and in 4 subgroups (never-smoking, 1-10 years, 11-20 years, and over 20 years of smoking). Conditional logistic regression was used to assess independent association between current smoking and years of smoking, and CIS, adjusting for age, level of education, hypertension, diabetes, alcohol consumption, obesity, and physical inactivity.
Results: Current smoking was associated with CIS in the entire cohort with an adjusted odds ratio (aOR) of 2.52 (95% confidence interval [CI] 1.68-3.78) and in men (aOR 4.05; 2.16-7.62), but not in women. In the entire cohort, every 5 years of smoking increased the risk of CIS by 19% (aOR 1.19; 1.08-1.30). Compared to never-smokers, aOR was 1.35; 0.89-2.03 for 1-10 years of smoking, 1.99; 1.22-3.26 for 11-20 years of smoking, and 2.40; 1.37-4.21 for over 20 years of smoking. In sex- and age-specific analyses, similar dose-depending associations were seen in men and in younger women (<41 years), but not in women $\geqslant 41$ years.
Conclusions: Current smoking and particularly total years of smoking were significantly associated with young-onset CIS with a dose-response manner, except for slightly older women.
Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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ASSOCIATION OF METHAMPHETAMINE AND OTHER SUBSTANCE ABUSE WITH ISCHEMIC AND HEMORRHAGIC STROKES IN YOUNG ADULT POPULATION IN A PRIMARY STROKE AND THROMBECTOMY CAPABLE CENTER IN CALIFORNIA

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Background and aims: Over the last 2 decades, the incidence of strokes in the young adult population has increased significantly. Concurrently, prevalence of substance abuse and more specifically, methamphetamine abuse has been on the rise. Despite the well-documented link between methamphetamine use and strokes, there is a lack of studies examining the direct number of strokes specifically associated with methamphetamine use in this demographic.
Methods: A retrospective observational study was conducted on all patients aged 49 years and younger who were admitted with a diagnosis of stroke between January 2019 and December 2020 at a large Stroke and thrombectomy capable center in California. The study population was divided into two groups: ischemic and hemorrhagic stroke. Data on baseline characteristics and outcomes was collected using electronic medical record and descriptive analysis performed. Substance abuse was determined using a positive drug screen or a documented history of current substance abuse.
Results: Of the 818 acute stroke patients admitted to the hospital, 106(12.9%) were under 49 years of age, with 61(10.03%) ischemic and 45(21%) hemorrhagic strokes. Among the ischemic stroke patients, 26.2% were using methamphetamine and 8.1% were using cocaine. Among the hemorrhagic stroke patients, 22.2% were using methamphetamine and 4.4%, cocaine.
Conclusions: Methamphetamine abuse is strongly linked to acute strokes in the young adults, both ischemic and hemorrhagic. With methamphetamine use rising, especially since the pandemic, it has become one of the major risk factors for strokes in this population and must be part of routine screening and secondary stroke prevention strategies.
Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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THE IMPACT OF REVASCULARISATION SURGERY ON HEADACHE AND CEREBROVASCULAR REACTIVITY IN PATIENTS WITH MOYAMOYA ARTERIOPATHY

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Background and aims: Significant headache in moyamoya arteriopathy is not uncommon but its pathophysiology is poorly understood. We aimed to investigate if headache in moyamoya patients improves after revascularization surgery and whether this is associated with improvement in cerebrovascular reactivity (CVR).
Methods: For this single-center retrospective study, adult patients with moyamoya arteriopathy who underwent uni- or bilateral extracranial-intracranial (EC-IC) bypass surgery between January-2010 and September-2022 were selected from a database with consecutive patients who had CVR-MRI for steno-occlusive disease. Clinical data including a headache history and imaging data were collected through systematic chart review. We assessed the association between headache and cerebrovascular reactivity before and after revascularization surgery.
Results: Fifty-one patients were included (mean age 42±13 years, 37 women (73%)). Thirty-three patients (65%) had bilateral moyamoya arteriopathy of whom 16 (48%) underwent bilateral EC-IC bypass surgery.
Thirty-five patients (69%) reported headache pre-surgery. Features included: episodic headache (96%), preceding aura (12%), predominantly throbbing headache (47%), nausea/vomiting (39%) and/or photo/phonophobia (15%); 48% of patients lost workdays because of headache.
Headache improved in 24/35 (69%) patients after surgery with reduction in pain severity (median VAS from 7 to 3; p0.01) and sick leave (48% to 19%). CVR improved in 26/45 (58%) patients who had pre- and post-surgery CVR-MRI, which was associated with headache improvement (OR:13;95%CI:1.3-124). Younger age was also associated with headache improvement post-surgery (OR:0.88; 95%CI:0.81-0.96).
Conclusions: Headache in moyamoya arteriopathy improved in most patients after revascularization surgery and was associated with improvement in cerebrovascular reactivity, supporting the hypothesis of a vascular origin.
Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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Predictive Value of Pediatric Stroke Diagnoses in a National Registry of Patients

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Background and aims: The aim of this study was to examine the positive predictive value(PPV) of pediatric stroke diagnoses in the Danish National Registry of Patients(DNRP).
Methods: We included all children registered with stroke or stroke-related diagnosis in the DNRP between January 2017 through December 2020. By medical record review, two researchers validated all cases. Kappa statistics was used to investigate the level of interrater agreement. Robustness of the PPVs was tested across three stroke definitions; the definition by the American Heart and American Stroke Association(AHA/ASA), the definition in the International Classification of Disease 11th version(ICD-11) and the definition by the World Health Organization (WHO).
Results: A total of 309 children registered with stroke or a stroke-related diagnosis were included. PPV varied across stroke subtypes from 0.85(95%CI: 0.55–0.98) for cerebral venous thrombosis, 0.83(95%CI: 0.71–0.92) for ischemic stroke(AIS), 0.57(95%CI: 0.37–0.76) for unspecified stroke to 0.42(95%CI: 0.33–0.52) and 0.07(95%CI: 0.01–0.22) for intracerebral hemorrhage and subarachnoid hemorrhage, respectively.

Among confirmed AIS cases, 36% were identified in non-AIS code groups. The overall interrater agreement was considered excellent(κ=0.86) but interrater agreement varied across stroke subtypes(range: κ=0.47-1.00). PPV varied significantly across stroke definitions with the highest for the AHA/ASA definition(PPV=0.39, 95%CI: 0.34-0.45) and the lowest for the WHO definition(PPV =0.29, 95%CI: 0.24-0.34).

Conclusions: The DNRP tends to overestimate the number of children with stroke while AIS is underestimated. In comparison of trend studies, differences in pediatric stroke incidence may reflect differences in stroke definitions or interrater variation in the diagnosis of stroke.

Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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SECONDARY PREVENTION IN ANTIPHOSPHOLIPID ANTIBODY RELATED STROKE PATIENTS

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Background and aims: The optimal treatment for antiphospholipid antibody-related stroke (aPL-stroke) is not established. Although current guidelines recommend warfarin in patients with confirmed antiphospholipid syndrome, data from clinical trials is limited to high-risk patients. To confirm the adequacy of warfarin for secondary prevention, we assessed the recurrence of arterial or venous thrombotic events in aPL-stroke patients receiving antiplatelet or anticoagulation therapy.

Methods: Patients visiting Seoul National University Hospital diagnosed with ischemic stroke and positive for an antiphospholipid antibody were identified. High-risk patients were those triple positive for anticardiolipin, lupus anticoagulant, and beta-2-glycoprotein I, or those with a high titer of anticardiolipin (> 80), or beta-2-glycoprotein I (> 80). Data for recurrent arterial or venous thrombosis events, baseline risk factors, and medication were collected, and analysis was done via a Cox proportional hazards model.

Results: Of 185 patients, 28 patients (15.1%) were high-risk and 157 patients (84.9%) were mild-moderate risk. In the mild-moderate risk patients, 4 patients (19.0%) receiving warfarin, 8 patients (17.8%) receiving single antiplatelet therapy, and 8 patients (10.4%) receiving dual antiplatelet therapy had a recurrent vascular event. After adjustment for age, sex, and other risk factors, there was no significant difference of recurrent vascular events between warfarin and single antiplatelet therapy (HR=0.86; CI=0.22-3.34) or dual antiplatelet therapy (HR=0.55; CI=0.14-2.21).

Conclusions: In this small sized retrospective study, treatment with antiplatelets showed a nonsignificant but lower trend of recurrent vascular events compared with warfarin in mild-moderate risk aPL-stroke. Large scale clinical trials are required to confirm these findings.

Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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Ischaemic and haemorrhagic strokes in patients with left ventricular assist device (LVAD) - a retrospective cohort study at a tertiary care center

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Background and aims: In the era of modern left ventricular assist devices (LVAD), ischaemic and haemorrhagic strokes remain frequent complications of complex aetiology. We aimed to investigate prevalence, risk factors and clinical courses of strokes after LVAD implantation at an experienced academic LVAD center.

Methods: Patient files and imaging of 249 patients who received a LVAD (HeartWare n=120; HeartMate3 n=119, others n=10) between 01/2015 and 08/2020 were retrospectively screened for the occurrence of cerebrovascular events using imaging and documented clinical data. Mean follow up was 1377 (659 to 2116) days after implantation. Cardiovascular risk factors, severity of heart failure (INTERMACS classification), postoperative courses, therapy and outcomes were recorded.

Results: 82 cerebrovascular events were identified in 54 of 249 (22%) patients after LVAD implantation (ischaemic strokes n=59, TIA n=6, ICH n=13, SAH n=3, SDH n=1). In 36 of 54 patients (67%) these occurred in an early peri- or postoperative setting. Device (HM3 vs. HW, p=0.255), severity of preoperative heart failure (INTERMACS score, p=0.648), or cardiovascular risk profile (CHAD2VAS2-Score, p=0.124) were not associated with early events. Instead, in multivariable analysis, kidney failure with need for dialysis after LVAD-implantation (OR 3.9; 95%CI: 1.4-11.2; p=0.011) and cardiac decompensation (OR 4.9; 95%CI: 1.4-16.5; p=0.009)

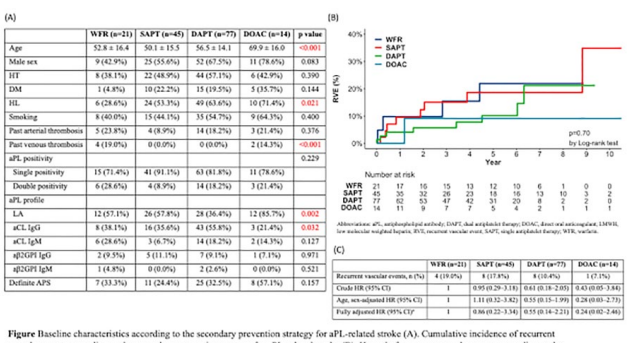
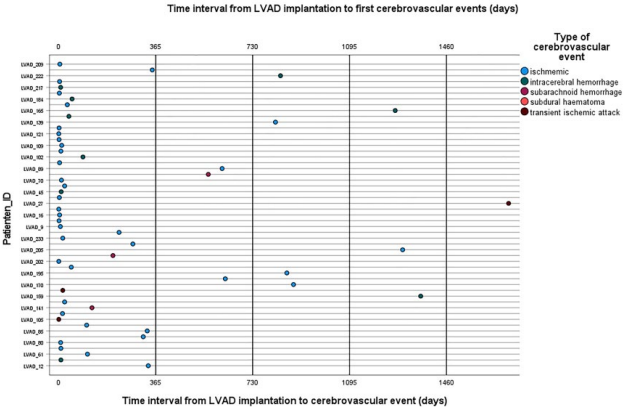


Figure Baseline characteristics according to the secondary prevention strategy for aPL-related stroke (A). Cumulative incidence of recurrent vascular events according to the secondary prevention strategy for aPL-related stroke (B). Hazard of recurrent vascular events according to the secondary prevention strategy for aPL-related stroke (C).



were independent risk factors for peri- and postoperative CVE. At hospital discharge after LVAD implantation functional outcome was worse in patients with stroke (mRS 3.3±1.4 vs 2.8±1.4; p=0.023)

Conclusions: Stroke remains a frequent complication under LVAD therapy, with a particular vulnerability in the peri- and postoperative phases of LVAD implantation.

Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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Safety and efficacy of endovascular treatment in extracranial and intracranial artery dissections presenting with acute ischemic stroke

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Background and aims: Extracranial(EADs) and intracranial artery dissections(IADs) are the leading cause of acute ischemic stroke(AIS) in young adults. Optimal endovascular therapeutic approach at AIS onset is currently discussed. Our aim is to report our experience in endovascular treatment(EVT) of AIS caused by EADs and IADs.

Methods: A retrospective single-centre analysis of EADs and IADs who underwent MT prospectively included in a registry between 2017-2021 was performed. Primary variables analysed were age, sex, NIHSS, ASPECTS, intravenous thrombolysis(IVT), MT technique, antiaggregant drugs and use of stent. Safety (symptomatic intracerebral haemorrhage-sICH) and efficacy (successful recanalization(TICI 2b-3) and functional outcome(mRS⩽2)) endpoints were compared.

Results: 34 EADs(73,9%) and 12 IADs(26.1%) were included(n=46). There was a male predominance(67.4%). Respectively, median age was 48 and 47, median NIHSS at onset was 17 and 14(p=0.764), and median ASPECTS was 8 and 10(p=0.388). IVT was administered in 15 EADs(44%) and 6 IADs(50%). First approach in most patients(80.4%) was aspiration technique. EADs had higher rates of TICI2b-3(91.2vs75%, p=0.135). Cervical stent was used in 19(41.3%) patients. In another 19 patients(41.3%), intracranial recanalization without cervical reconstruction was obtained. Most patients received at least one(67.4%) or two(8.7%) intravenous antiaggregant drugs, mostly Inyesprin(50%). We had only one sICH(2,2%) at 24h and mRs0-2 at 3 months was slightly higher in EADs(73.5%vs66.7%, p=0.346). All deaths(3) occurred in EADs group(6,5%).

Conclusions: Patients with AIS due to arterial dissection present with severe strokes and high heterogeneity. However functional outcome post-treatment at three months is good, with slight but not significant differences between EADs and IAD.

Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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ENDOVASCULAR TREATMENT IN CEREBRAL VENOUS SINUS THROMBOSIS DUE TO VACCINE-INDUCED IMMUNE THROMBOTIC THROMBOCYTOPENIA

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Background and aims: Cerebral venous sinus thrombosis (CVST) is the most serious manifestation of vaccine-induced immune thrombotic thrombocytopenia (VITT), a rare adverse event occurring after severe acute respiratory syndrome-coronavirus 2 (SARS-CoV-2) vaccination. Here, we describe clinical outcomes of CVST-VITT patients undergoing endovascular treatment (EVT).

Methods: We used data from an international registry of patients who developed CVST within 28 days of SARS-CoV-2 vaccination, reported between 29 March 2021 and 28 December 2022. We included definite, probable and possible VITT cases, as defined by the Pavord criteria. Outcomes were recanalization, mortality, functional independence at discharge and at last follow-up.
Results: EVT was performed in 17/135 (13%) CVST-VITT patients. Median age was 40 years (IQR 25-48), 15/17 (88%) were women. At admission, five patients (33%) were comatose and median thrombus load score was 5 (IQR 3-6). Most common EVT indication was widespread or progressive thrombosis (10/12, 83%). In 6/8 (75%) cases there was partial/full recanalization in at least one vein/sinus. Eight patients (67%) suffered worsening of intracerebral haemorrhagic lesions. Nine patients (53%) underwent decompressive surgery. Mortality was 8/17 (47%), all due to brain herniation. At discharge, 3/16 patients (19%, 38% of surviving patients) and after 6 (IQR 2-8) months, 9/17 (53%, 100% of surviving patients) were independent.
Conclusions: More than one tenth of CVST-VITT patients underwent EVT. Almost half of these patients died, despite high rate of at least partial recanalization. At discharge, one fifth of EVT CVST-VITT patients were independent. All patients who survived the initial admission were independent at follow-up.
Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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MOYAMOYA ANGIOPATHY IN A NORWEGIAN PATIENT COHORT: CHARACTERISTICS AND OUTCOME

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Background and aims: Moyamoya angiopathy (MMA) is a rare intracerebral steno-occlusive, progressive vasculopathy. Increasing awareness of MMA in European populations has impacted on the incidence recently. This is the first description of a Norwegian MMA cohort.
Methods: A retrospective analysis of consecutive patients with MMA, treated with revascularization surgery or followed conservatively at Oslo University Hospital, between January 2010 to October 2021, was performed.
Results: We identified 63 MMA patients, 56 (89%) had moyamoya disease (MMD) and 7 (11%) moyamoya syndrome. 47 (75%) were females. Mean age for symptom onset was 36 (SD 15.6) years. The majority, 41 (65%), were of Caucasian ethnicity, followed by Asian 15 (24%), African 6 (9.5%) and Hispanic 1 (1.5%). Verified familial MMD occurred in 1 (1.5%) of patients. An acute clinical presentation occurred in 24 (38%) of patients, on imaging ischemic lesions were noted in 22 (35%) and hemorrhagic in 9 (14%). Cerebral vasculitis was initially misdiagnosed in 6 (9.5%) of patients. Revascularization treatment was performed in 30 (48%) patients. Mean years of follow-up was 8 (SD 6.9). At baseline, 29 (46%) were employed, vs. 18 (29%) at last follow-up ($p < 0.001$). Initially, 55 (87%) had modified Ranking Scale ≤ 2 vs. 47 (75%) at last follow-up ($p < 0.001$). Mortality for the cohort was 5 (7.9%) during a total of 498 years of follow-up.
Conclusions: MMA patients in our cohort had a decline in work capacity and functional independency over time. Our results underscore the importance of long-term follow-up and support of MMA patients.
Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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TRIGGER FACTORS IN PATIENTS WITH A PATENT FORAMEN OVALE ASSOCIATED STROKE: A CASE-CROSSOVER STUDY

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Background and aims: Patent foramen ovale (PFO) is an anatomical variant that is associated with stroke, especially in adults under the age of 60 years. It remains unclear what factors may trigger stroke at a certain point in time, as the PFO is always present. We aimed to investigate trigger factors in PFO-associated stroke.
Methods: In the ODYSSEY Study, patients aged 18-49 years with first-ever ischemic stroke between 2013 and 2021 were included in one of 17 participating centers in the Netherlands. They completed a questionnaire about exposure to potential trigger factors in predefined hazard periods and on a yearly basis. A case-crossover design was used to assess the relative risks (RR) with 95% confidence intervals (95% CI) for trigger factors for ischemic stroke in patients with a PFO-associated stroke compared to patients with a PFO and stroke of other etiology.
Results: 1043 patients (79%) completed the questionnaire. 83 patients with a PFO-associated stroke (median age 42.1 years, 48.2% men) underwent PFO closure. For patients with PFO-associated stroke the relative risk increase was 30.3 (95% CI 7.2-128.2) for fever and 36.3 (95% CI 12.4-106.2) for flu-like disease. This was higher than for the 89 patients with a PFO and stroke of other etiology (RR 8.9, 95% CI 1.2-65.8 and RR 10.1, 95% CI 1.4-73.7, respectively). Another potential trigger factor for PFO-associated stroke was any type of vigorous exercise (RR 3.32, 95% CI 2.0-5.4).
Conclusions: Several trigger factors (fever, flu-like disease and vigorous exercise) exist for PFO-associated stroke in young adults.
Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

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CHARACTERISTICS OF PATIENTS WITH PFO IN YOUNG PATIENTS WITH ESUS AND ASSOCIATION WITH STROKE RECURRENCE

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Background and aims: Patent foramen ovale (PFO)–associated strokes comprise approximately 10% of ischemic strokes in young adults. We aimed to describe and compare characteristics of pathogenic and non-pathogenic PFO in a well-defined young Embolic Stroke of Undetermined source (ESUS) population.
Methods: Young ESUS study, prospectively enrolled 535 consecutive patients 50-years and younger with ESUS from 10/2017 to 10/2019 in 41 stroke centers in 13 countries and followed up for a median duration of 18 months. Pathogenic PFO were defined by PASCAL score.
Results: 535 patients were enrolled (mean age 40.4(SD 7.3) years, 238 (44%) female). Of the 354 participants that had TTE with bubble study, 177(50%) had PFO identified and of the 226 that had a TOE 113(50%) had a PFO identified. PFO by TTE or TOE were identified in 195 (36%). When comparing to the non-PFO group, participants with PFO had less traditional vascular risk factors (hypertension, diabetes mellitus, hyperlipidemia) and a lower BMI. Large shunt was present in 41 and atrial septal aneurysm in 33 of those with TOE. 161 patients had possible {112 (57%)} or probable {49 (22%)} PFO related stroke. Having a pathogenic PFO did not predict stroke recurrence.
Conclusions: In this young ESUS cohort the prevalence of PFO was high. The prevalence rate is likely an underestimation due to underutilization of TOE and TTE with bubble studies. Pathogenic PFO was not a predictor of recurrence, possibly due to the relatively shorter length of follow up and/or the relatively lower risk of recurrence via PFO.
Disclosure of interest: No

CARDIOEMBOLISM & HEART-BRAIN INTERACTIONS

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INFECTIVE ENDOCARDITIS WITH AND WITHOUT STROKE

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Background and aims: Infective endocarditis (IE) is a devastating disease with high morbidity and mortality. Stroke is one of the most feared complications of IE. Data on how IE patients with and without stroke differ are scarce but may help to raise awareness and facilitate earlier treatment.
Methods: Data on all patients with IE with or without associated stroke were retrieved from the medical records of three university hospital sites (Charité – Universitätsmedizin Berlin) for the period 2019-2021. Univariable and multivariable logistic regression analyses were performed to identify variables associated with diagnosis of stroke.
Results: IE was diagnosed in 353 patients (median age 69; 72% male) and 96/353 (27%) had a stroke (median age 68; 77% male; 66% ischemic, 8% haemorrhagic, 26% both aetiologies; median NIHSS 4). Of all patients, 46 (13%) initially presented with symptoms of stroke. In-hospital death occurred in 75 patients (21%). Variables independently associated with stroke are given in Table 1.
Conclusions: This analysis puts emphasis on the search for dental focuses in IE. Patients with congenital heart disease or pre-existing foreign material may be less likely to suffer a stroke, possibly because of higher awareness or prophylaxis.

Table 1.

Variables associated with STROKE	Adjusted Odds Ratio	95% Confidence Interval
Congenital heart disease (e.g. bicuspid aortic valve)	0.19	0.04-0.89
Pre-existing foreign material in the heart (other than artificial heart valves)	0.44	0.20-0.94
Mitral and/or aortic valves affected	21.81	2.81-169.24
Dental focus of infection	2.52	1.02-6.21
Non-cerebral arterial embolism	2.79	1.53-5.10
Acute liver failure	2.63	1.10-6.29

Disclosure of interest: No

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DETECTION OF ATRIAL FIBRILLATION IA ACUTE ISCHEMIC STROKE PATIENTS TREATED WITH MECHANICAL THROMBECTOMY FOR MIDDLE CEREBRAL ARTERY OCCLUSION: PILOT RESULTS FROM THE MCA-AF STUDY

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Background and aims: In patients with cryptogenic ischemic stroke (IS), especially in those with embolic one, undetected paroxysmal atrial fibrillation (AF) is often suspected a possible cause. Thus, we aimed to assess presence of AF using ECG Holter in acute IS patients with middle cerebral artery (MCA) occlusion, who underwent mechanical thrombectomy (MT).
Methods: Consecutive AIS patients treated with MT for isolated MCA occlusion were enrolled in the prospective MCA-AF study in year 2022. Only exclusion criterion was known or detected AF before the enrollment. All enrolled patients underwent ICU telemetry, standard 24-hour

ECG-Holter and outpatient 4-week ECG-Holter monitoring. Achieved results were compared to those from the nationwide METRICS study performed in 2019, in which no specific protocol for AF detection after IS was applied.

Results: Of 102 patients treated with MT, 72 (70.6%, 43.8% males, mean age 75 ± 11.4 years) were enrolled in the MCA-AF study. Recanalization was achieved in 69 (95.9%) patients and 38 (52.7%) patients had mRS 0-2. In total, AF was registered in 59 (81.9%) patients; in three (5.1%) on 24h ECG-Holter and in 10 (16.9%) during long-term ECG-Holter. AF was registered more frequently in MCA-AF patients compared to those from the METRICS study (59/72, 81.9% vs. 223/557, 40.1%, $p<0.0001$).

Conclusions: AF was registered in 81.9% of IS patients treated with MT for MCA occlusion. Using a specific detection protocol including the 4-week ECG-Holter increased the detection rate of AF about 40%.

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Disclosure of interest: No

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Machine Learning Modelling to Predict Atrial Fibrillation Detection in Embolic Stroke of Undetermined Source Patients

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Background and aims: Occult atrial fibrillation (AF) has been implicated as a key source of embolism in embolic stroke of undetermined source (ESUS). Whilst the use of implantable loop recorders (ILR) increases detection of occult AF, it is costly and may be inconvenient. Improved methods to screen and identify higher risk patients prior to ILR evaluation are needed. We incorporate clinical and echocardiography data into machine learning algorithms for AF prediction.

Methods: This was a single-center cohort study that investigated ESUS patients from 2015 to 2022 who had ILR evaluation. We developed four machine learning models (random forest, XGBoost, support vector machine (SVM) and multilayer perceptron (MLP)) utilizing easily available clinical and echocardiography data and evaluated their performance in the primary outcome of predicting AF detected on ILR.

Results: The median age was 67 (IQR 59–74) years-old, with 43 (27.4%) patients being female. Of 157 patients, 32 (20.4%) had occult AF detected. Clinical and echocardiographic characteristics comparing patients with and without occult AF are illustrated (Table 1 and 2). The SVM predicted AF detection with a 95% confidence interval area under the receiver operating characteristic curve (AUC) of 0.736-0.737; MLP (AUC 0.697-0.708); XGBoost (AUC 0.697-0.697) and random forest (AUC 0.663-0.674). In terms of feature importance, age, HDL-C and admitting heart rate were significant clinical variables, while peak mitral A-wave velocity and left atrial volume were important echocardiography parameters (Figure 1 and 2).

Conclusions: Machine learning modelling incorporating clinical and echocardiographic variables predicted AF in ESUS patients with reasonable accuracy.

Figure 1: Feature Importance of Best-performing Random Forest Model

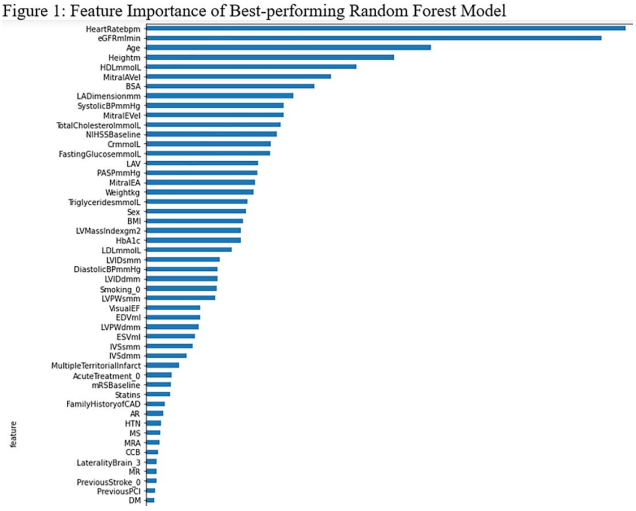

Figure 2: Mean Absolute SHAP values of Features in Best-performing SVM Model (top 20 features displayed)

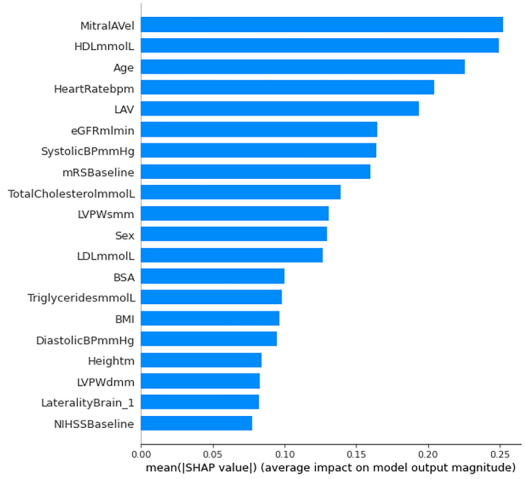

Table 1: Clinical characteristics comparing ESUS patients with and without AF detected on ILR

Variable	Total (N = 157)	No AF on ILR (n = 125)	AF on ILR (n = 32)	p-value
Age (median [IQR])	67.00 [59.00, 74.00]	65.00 [57.00, 72.00]	73.50 [67.00, 77.25]	<0.001
Sex; Female (%)	43 (27.4)	28 (22.4)	15 (46.9)	0.011
BMI (median [IQR])	24.09 [21.53, 27.22]	24.09 [21.69, 27.14]	23.68 [21.42, 28.89]	0.893
Height, m (median [IQR])	1.64 [1.57, 1.70]	1.65 [1.58, 1.70]	1.62 [1.54, 1.67]	0.142
Weight, kg (median [IQR])	64.70 [56.40, 74.50]	64.90 [56.60, 75.00]	62.60 [52.99, 74.20]	0.452
Systolic blood pressure, mmHg (median [IQR])	152.00 [132.00, 170.00]	150.00 [132.25, 168.50]	162.00 [129.50, 175.00]	0.490
Diastolic blood pressure, mmHg (median [IQR])	82.00 [72.00, 92.00]	82.50 [72.00, 92.75]	82.00 [72.50, 86.00]	0.416
Heart Rate, bpm (median [IQR])	78.00 [68.00, 88.00]	80.00 [71.50, 89.00]	68.00 [63.00, 82.00]	0.003
Hypertension, n (%)	108 (68.8)	83 (66.4)	25 (78.1)	0.288
Dyslipidemia, n (%)	96 (61.1)	76 (60.8)	20 (62.5)	1
Diabetes mellitus (DM), n (%)	60 (38.2)	50 (40.0)	10 (31.2)	0.604
History of ischemic stroke / TIA, n (%)	59 (37.6)	49 (39.2)	10 (31.2)	0.682
Total Cholesterol, mmol/L (median [IQR])	4.56 [3.80, 5.34]	4.53 [3.78, 5.32]	4.84 [4.22, 5.81]	0.085
LDL, mmol/L (median [IQR])	2.88 [2.03, 3.54]	2.77 [1.94, 3.49]	3.02 [2.28, 4.24]	0.079
HDL, mmol/L (median [IQR])	1.15 [1.00, 1.35]	1.13 [1.00, 1.30]	1.34 [1.06, 1.67]	0.004
Triglycerides, mmol/L	1.26 [0.98, 1.81]	1.26 [0.98, 1.85]	1.28 [1.01, 1.79]	0.82
HbA1c, % (median [IQR])	6.05 [5.60, 6.93]	6.20 [5.70, 7.07]	5.90 [5.53, 6.50]	0.207
Fasting Glucose, mmol/L	5.70 [5.20, 6.50]	5.70 [5.30, 6.70]	5.45 [5.20, 5.97]	0.217
Cr, mmol/L (median [IQR])	77.00 [61.50, 93.50]	76.00 [62.25, 90.00]	81.00 [58.00, 100.00]	0.419
eGFR, ml/min (median [IQR])	89.00 [69.25, 99.00]	91.00 [75.25, 100.00]	76.00 [57.50, 91.00]	0.012
Laterality of Infarct, n (%)				0.127
Left	68 (44.2)	54 (43.9)	14 (45.2)	
Right	58 (37.7)	43 (35.0)	15 (48.4)	
Bilateral	28 (18.2)	26 (21.1)	2 (6.5)	
Multiple Territorial, n (%)	53 (34.2)	45 (36.0)	8 (26.7)	0.451
NIHSS (median [IQR])	4.00 [1.50, 8.50]	4.00 [2.00, 7.75]	3.00 [1.00, 14.00]	0.78
Duration of monitoring, days	1051 [478, 1287]	1024 [387, 1287]	1093 [664, 1283]	0.33

Abbreviations:
eGFR: estimated glomerular filtration rate; HDL: high-density lipoprotein cholesterol; LDL: low-density lipoprotein cholesterol; BMI: body-mass index; NIHSS: National Institutes of Health Stroke Scale

Table 2: Echocardiographic characteristics comparing ESUS patients with and without AF detected on ILR

Echocardiography Parameters				
Variable	Total (*N* = 157)	AF not detected on ILR (n = 125)	AF detected on ILR (n = 32)	p-value
Mitral E-wave Velocity (median [IQR])	63.40 [53.22, 80.40]	62.30 [54.00, 79.90]	69.30 [52.15, 81.38]	0.624
Mitral A-wave Velocity (median [IQR])	79.00 [63.33, 92.27]	78.10 [62.97, 88.70]	89.50 [66.75, 106.00]	0.105
Mitral E/A (median [IQR])	0.86 [0.67, 1.04]	0.88 [0.67, 1.06]	0.74 [0.66, 0.89]	0.277
PASP, mmHg (median [IQR])	29.00 [26.00, 34.00]	29.00 [26.00, 34.00]	29.50 [26.50, 34.25]	0.842
LVIDd, mm (median [IQR])	47.00 [43.00, 51.00]	47.00 [43.00, 51.00]	48.00 [42.75, 51.00]	0.866
LVIDs, mm (median [IQR])	30.00 [26.00, 33.00]	30.00 [26.00, 33.00]	29.50 [25.75, 33.00]	0.867
LVEDV, ml (median [IQR])	102.00 [79.00, 124.00]	99.50 [79.00, 124.00]	108.00 [82.00, 124.00]	0.719
LVESV, ml (median [IQR])	32.00 [25.00, 44.00]	32.00 [25.00, 44.00]	33.35 [24.25, 44.00]	0.965
Left Ventricular Visual Ejection Fraction (median [IQR])	63.00 [60.00, 65.00]	62.00 [60.00, 65.00]	65.00 [57.75, 65.00]	0.734
IVSd, mm (median [IQR])	10.00 [9.00, 12.00]	10.00 [9.00, 12.00]	10.00 [9.00, 12.00]	0.931
IVSs, mm (median [IQR])	14.00 [12.00, 16.00]	14.00 [12.00, 16.00]	14.00 [12.75, 16.50]	0.926
LVPWd, mm (median [IQR])	10.00 [9.00, 11.00]	10.00 [8.50, 11.00]	10.00 [9.00, 11.00]	0.483
LVPWs, mm (median [IQR])	15.00 [13.00, 16.00]	15.00 [13.00, 16.00]	14.00 [13.00, 16.00]	0.83
Left Atrial Dimension, mm (median [IQR])	37.00 [33.00, 41.00]	37.00 [33.00, 41.00]	39.00 [35.75, 42.25]	0.077
Left Atrial Volume, ml/m^2 (median [IQR])	45.00 [36.32, 56.30]	44.90 [34.20, 55.00]	50.81 [38.62, 61.61]	0.088
LV Mass Index, g/m^2 (median [IQR])	90.00 [77.00, 109.00]	89.00 [76.00, 106.00]	95.00 [79.50, 110.25]	0.701
Presence of Regional Wall Motion Abnormality, n (%)	25 (15.9)	20 (16.0)	5 (15.6)	1

Abbreviations: IVSd: interventricular septal end diastole; IVSs: Interventricular septal end systole
PASP: pulmonary artery systolic pressure; LVPWd: left ventricular posterior wall end-diastole
LVPWs: left ventricular posterior wall end-systole; LVEDV: left ventricular end-diastole volume
LVESV: left ventricular end-systole volume; LVIDd: left ventricular internal diameter end diastole
LVIDs: left ventricular internal diameter end systole; Mitral E/A: Mitral Ratio of Peak Early to Late Diastolic Filling Velocity
Mitral A Vel: peak mitral A-wave velocity

Disclosure of interest: No

CARDIOEMBOLISM & HEART-BRAIN INTERACTIONS

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CARDIAC NATRIURETIC PEPTIDES FOR PREDICTION OF ATRIAL FIBRILLATION IN STROKE PATIENTS: A SYSTEMATIC REVIEW AND META-ANALYSIS OF DIAGNOSTIC TEST ACCURACY

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Background and aims: Presence of atrial fibrillation (AF) in stroke patients increases the risk of stroke recurrence and mortality. B-type natriuretic peptide (BNP) and N-terminal pro-BNP (NT-proBNP) are promising in predicting AF. We evaluated the diagnostic performance of BNP and NT-proBNP in predicting AF in stroke patients at various cutoffs.

Methods: PubMed, Embase and Cochrane CENTRAL were searched from inception to 8 December 2022 for eligible studies. Confusion matrices were constructed for each study and cutoffs of the peptides were extracted. Linear mixed models were fitted to estimate the peptides' distribution functions. For models which converged, we selected the model that minimised the restricted maximum likelihood criterion. Area under the summary receiver-operator-characteristic curve (AUC) and diagnostic accuracy were evaluated for each peptide.

Results: Data on NT-proBNP from 1753 patients and BNP from 2354 patients were pooled. NT-proBNP had an AUC of 0.733 (95%CI: 0.339 – 0.913) while BNP had an AUC of 0.818 (95%CI: 0.646 – 0.922). In studies where patients' average age >70, AUC of NT-proBNP was 0.714 (95%CI: 0.566 – 0.840) while AUC of BNP was 0.782 (95%CI: 0.621 – 0.894). In studies where patients' average age ≤70, NT-proBNP had an AUC of 0.753 (95%CI: 0.137 – 0.963) while BNP had an AUC of 0.824 (95%CI: 0.638 – 0.933). Sensitivity and specificity at various cutoffs were calculated (Table 1). For every increase of 10pg/ml in BNP, odds of AF increased by 1.14 times (95%CI: 1.06 – 1.22).

Conclusions: NT-proBNP and BNP have high diagnostic accuracy and should be incorporated in future AF risk-prognostication tools.

		Overall		>70 years old		≤70 years old	
Biomarker	Cutoff/ pg/ml	Sensitivity/ %	Specificity/ %	Sensitivity/ %	Specificity/ %	Sensitivity/ %	Specificity/ %
BNP	40	90.1	43.4	81.7	56.4	99.9	22.4
BNP	60	84.0	60.6	73.4	70.4	99.3	39.5
BNP	80	78.1	71.6	66.2	78.6	97.4	53.8
BNP	100	72.5	78.7	60.1	83.7	93.1	64.6
BNP	120	67.3	83.5	54.8	87.1	85.4	72.5
BNP	140	62.6	86.8	50.3	89.5	74.1	78.3
BNP	160	58.3	89.2	46.3	91.3	60.8	82.5
BNP	180	54.4	91.0	42.9	92.6	47.4	85.7
BNP	200	50.8	92.4	39.8	93.6	35.6	88.1
NT-proBNP	150	74.7	52.8	89.9	37.5	71.5	67.8
NT-proBNP	250	69.6	65.2	79.5	53.8	68.3	74.2
NT-proBNP	350	66.0	72.4	69.3	64.4	66.1	78.0
NT-proBNP	450	63.1	77.2	60.0	71.4	64.4	80.6
NT-proBNP	550	60.7	80.6	52.0	76.4	63.0	82.4
NT-proBNP	650	58.8	83.1	45.3	80.1	61.8	83.9
NT-proBNP	750	57.0	85.0	39.6	82.9	60.8	85.0
NT-proBNP	850	55.5	86.5	34.9	85.1	59.9	86.0
NT-proBNP	950	54.1	87.8	30.9	86.8	59.1	86.8

Table 1: Estimated sensitivity and specificity at various cutoffs

Disclosure of interest: No

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STROKE-HEART SYNDROME: DOES SEX MATTER?

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Background and aims: Cardiovascular complications after acute ischemic stroke (AIS) can be related to chronic/comorbid cardiac conditions or acute disruption of brain-heart autonomic axis (stroke-heart syndrome). We investigated sex-differences in cardiac troponin (cTn) elevation and cardiac events after AIS. We hypothesized that women have greater risk of post-stroke myocardial injury (PSMI), possibly related to stroke-heart syndrome.

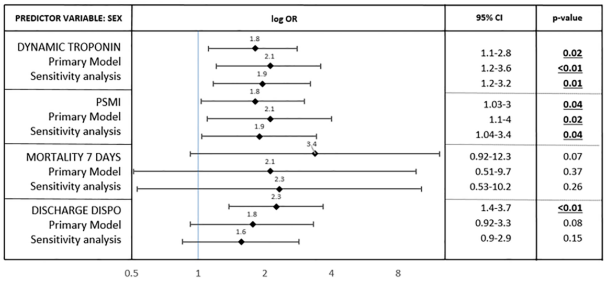
Methods: We analyzed a retrospective cohort of consecutive AIS patients from five stroke centers. We included AIS patients with elevated baseline cTn and at least 2 cTn measurements; we excluded patients with comorbidities that could impact cTn levels. PSMI was defined as the presence of a dynamic cTn pattern (rise/fall>20% in serial measurements) and clinically diagnosed acute myocardial injury (new ECG or echocardiogram changes, new-onset arrhythmia, Takotsubo syndrome) in the absence of confirmed acute coronary artery disease (CAD) (negative angiography or test not recommended by cardiologists due to low suspicion for CAD).

Results: Of 300 included patients, 160 were women (53%).Women were older, had a lower burden of cardiovascular risk factors, more frequently suffered from cardioembolic stroke and right insula involvement (p-values all <0.05). In multivariate analysis (Figure), women were more likely to have a dynamic cTn pattern (aOR=2.1, 95%CI:1.2-3.6) and develop PSMI (aOR=2.1, CI:1.1-4.0). Patients with PSMI had higher 7-day mortality (aOR=8.01, CI=1.7-38.9).

Conclusions: In AIS patients with elevated cTn at baseline, women are more likely to develop PSMI, and this is associated with higher short-term mortality. Translational studies are needed to clarify mechanisms underlying sex-differences in cardiac outcomes and mortality in AIS.

Disclosure of interest: No

Figure. Multivariate analysis of association of sex and main outcome measures



Odds ratios (OR) for association of sex with dynamic pattern of cardiac troponin, post-stroke myocardial injury (PSMI), mortality within 7 days, and discharge disposition. PSMI: post-stroke myocardial injury.
Primary model: adjusted for age, race, medical history of chronic kidney disease (CKD), coronary artery disease (CAD), acute congestive heart failure (CHF), atrial fibrillation (AF) or flutter, National Institutes of Health Stroke Scale (NIHSS) at admission, right insula involvement, TOAST classification.
Sensitivity analysis: adjusted for age, race, medical history of CKD, CAD, CHF, AF or flutter, NIHSS at admission, right insula involvement.

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LEFT ATRIAL APPENDAGE CLOSURE IN ATRIAL FIBRILLATION PATIENTS WITH ISCHEMIC STROKE DESPITE ANTICOAGULATION

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Background and aims: Acute ischemic stroke (AIS) while using oral anticoagulants (OAC) is an increasingly recognized problem among non-valvular atrial fibrillation (NVAF) patients. We aimed to elucidate the potential role of left atrial appendage closure (LAAC) for recurrent stroke prevention in this high-risk population.

Methods: Detailed baseline and follow up data from 29 consecutive NVAF patients who had AIS despite use of OAC and subsequently received LAAC for further stroke prevention, were collected from a single hospital system (2015-2022). Primary outcome measure was the occurrence of AIS after LAAC, and safety outcome was intracerebral hemorrhage (ICH).

Results: Out of 643 patients who had LAAC, 29 had the WATCHMAN implant specifically due to AIS-despite-OAC. Mean age was 73.4±8.7, 13 were female (44.8%). Mean CHA_2DS_2-VASc score was 5.86±1.25. Fourteen patients had 2 or more AIS-despite-OAC. After LAAC, 27 patients (93%) were discharged on OAC which was discontinued in 18 (62.06%) after TEE at 6-weeks. Over a mean 1.46 years follow up, one patient had a small subcortical infarct despite continued OAC use (incidence rate [IR] 2.36 per 100 person-years) and one patient had a small cerebellar ICH while on apixaban and aspirin (IR 2.36%/year).

Conclusions: LAAC in patients who had AIS-despite-OAC resulted in lower rates of recurrent AIS than reported in recent large series of AIS-despite-OAC patients treated with OAC only (2.36%/year vs 8.9%/year), while the ICH rates were similar [Seiffge et al. Ann Neurol 2020 May]. These findings support randomized trials of LAAC in patients who have AIS despite OAC use.

Disclosure of interest: No

CARDIOEMBOLISM & HEART-BRAIN INTERACTIONS

1505

ANATOMICAL FEATURES OF PATENT FORAMEN OVALE IN PATIENTS WITH CRYPTOGENIC STROKE IN COMPARSION TO AUTOPSY RESULTS

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Background and aims: The prevalence of patent foramen ovale (PFO) is approximately 25%, based on an autopsy study (Hagen et al, 1984). Not all patients with a PFO will suffer from a PFO-associated stroke. Therefore, we wanted to investigate whether anatomical characteristics differ between asymptomatic PFOs found during autopsy and PFOs related to stroke.
Methods: All consecutive patients that underwent PFO closure in the two participating medical centers were included retrospectively. PFO diameter, tunnel length and the presence of atrial septal aneurysm were measured with transesophageal echocardiography (TEE). The PFO diameter measured before the procedure was defined as unstretched and during the procedure, using a guidewire, was defined as stretched. It was compared to the autopsy study, in which 965 autopsy specimens of healthy human hearts were examined for the presence of a PFO.
Results: In total 228 patients who underwent PFO closure were enrolled. The mean age was 43 (SD=11) years, 116 patients (50.9%) were male and the mean RoPE-score was 7.0 (SD=1.4). The mean shunt grade during Valsalva maneuver was >20 bubbles (grade III). The mean PFO diameter of the unstretched group (n=119) was 5.4mm (SD=2.6) and 10.9mm (SD=3.6) of the stretched group (n=109), compared to 4.9mm (SD=2.6) found in the autopsy study (n=263).
Conclusions: This study found that the diameter of PFOs related to a stroke are different than those found during autopsy. It emphasizes the importance of cardiac analysis in the cryptogenic stroke work-up and demonstrates that the prevalence of PFOs related to stroke remains unknown.
Disclosure of interest: No

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DETECTION OF LEFT ATRIAL THROMBUS IN ISCHEMIC STROKE BY ENLARGED CTA SCAN-RANGE AND ASSOCIATION WITH PATIENT CHARACTERISTICS

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Background and aims: Left atrial or left atrial appendage thrombi (LAT/LAAT) are sometimes observed in patients with embolic ischemic stroke (IS) and associated with an increased risk of recurrence. We asses an enlarged-window CTA protocol to detect LAT/LAAT and its association with patient characteristics.
Methods: During 2021, hyperacute stroke CTA protocol was modified by extending the scan-range to include left atria. In confirmed IS patients, CTA was retrospectively reviewed to evaluate atrial contrast fulfilling and to classify it in: complete normal fulfilling, indeterminate non-complete fulfilling or incomplete fulfilling suggesting LAT/LAAT. Univariate and multivariate logistic regression models were performed to evaluate factors associated to LAT/LAAT.
Results: 555 consecutive IS patients were evaluated. CTA was performed in 406 of whom 107 were excluded due to inadequate CTA atrial coverage. A complete normal atrial fulfilling was observed in 261 patients and only 32 had an indeterminate non-complete fulfilling. LAT/LAAT was detected in 6 patients (2% of the assessable CTA). Age, sex, and risk factors were similar in patients with LAT/LAAT compared to normal CTA; except for previous AF (50% vs 7.7%). AF was present in 3/6 LAA/LAAT patients, all of them under anticoagulant therapy, and was newly diagnosed in another patient. In patients with AF, LAA/LAAT appears in 16% vs 1.2% in patients without previous AF. Only AF remains associated with LAT/LAAT detection in multivariate analysis [OR (95%CI): 17.39 (2.81-107.54)].
Conclusions: LAA/LA imaging as part of the acute stroke imaging protocol is feasible and could be valuable in AF patients, even under anticoagulation.
Disclosure of interest: No

CARDIOEMBOLISM & HEART-BRAIN INTERACTIONS

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Prognostic significance of atrial cardiopathy in patients with cryptogenic ischemic stroke and insertable cardiac monitor

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Background and aims: The atrial cardiopathy indicates atrial structural and functional disorders that may precede Atrial Fibrilation (AF). The insertable cardiac monitor are tools with proven efficacy in the diagnosis of cardiac arrhythmias in stroke patients, although their cost-effectiveness is not well know. We evaluated the association between markers of atrial cardiopathy and the profitability of the diagnosis of AF using an insertable cardiac monitor (ICM) in patients with cryptogenic stroke.
Methods: Initial demographic information was extracted from the electronic medical records, such as gender, age, and medical history. Stroke severity and brain MRI of each patient was reviewed. Cardiac evaluation of all patients, including ECG, transthoracic echocardiograms, and 24-h external ECG monitoring, was reviewed. We evaluated several potential biomarkers indicative of atrial cardiopathy.
Results: A total of 122 patients were included, mean age: 67.1 [SD: 10.9] years, 43.4% women). AF was detected in 26 patients (21.3%). AF detection was increased by excessive ectopic supraventricular activity (odds ratio: 2.85, 95%CI: 1.08-7.60; p= 0.035), significantly larger left atrium (OR: 7.44, 95%CI: 1.47-37.5; p= 0.055), and presence of mitral valve disease (OR: 8.80, 95%CI: 2.02-38 .2, p= 0.004). The ROC analysis of the adjusted model of these markers of atrial cardiopathy in the prediction of AF by ICM was ROC AUC: 0.713, 95%CI: 0.589-0.836, p= 0.001).
Conclusions: The markers of atrial cardiopathy appears to be valuable as a starting point for the diagnosis of atrial fibrillation using an insertable cardiac monitor in established cryptogenic stroke, improving the cost-effectiveness of the device.
Disclosure of interest: No

CARDIOEMBOLISM & HEART-BRAIN INTERACTIONS

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Neuroimaging and risk of hemorrhagic transformation in recent cardioembolic stroke under anticoagulant treatment

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Background and aims: Hemorrhagic transformation (HT) is a potential complication of cardioembolic stroke, even more in patients under anticoagulant treatment (AC). Our aim was to assess HT risk in acute cardioembolic stroke patients continuing AC based on their clinico-radiological profile at admission.
Methods: Retrospective observational study of acute cardioembolic stroke patients admitted to a Stroke Center between 2014 and 2021 who were maintained on AC therapy after admission at the physician's discretion. We describe clinical and radiological characteristics on admission non-contrast and CT-angio (blinded assessment) including ASPECTS, presence of leukoaraiosis and intracranial occlusion, mechanical thrombectomy (MT) performance and unsuccessful recanalization (TICI 0-2A) after MT. We used cross-table11.
Results: We identified 189 patients (age mean 78.4 +/- 8.8 years), initial NIHSS median (IQR) 5 (3-11) points. ASPECTS median (IQR) 10 (8-10) points. Leukoaraiosis was present in 121 (64%) patients, and medium-large vessel occlusion in 66 (34.9%). MT was performed in 28 (14.8%) patients, 8 of them (28.6%) with unsuccessful recanalization. HT during admission occurred in 24 (15.6%) patients, but only 2 (1.1%) presented with neurological worsening. There were not significant differences regarding ASPECTS, leukoaraiosis, intracranial occlusion, MT, or unsuccessful recanalization between patients with and without incident HT.
Conclusions: In our study, only 1.1% of patients with recent cardioembolic stroke who maintained AC presented symptomatic HT. Further prospective studies are needed to confirm the safety of AC continuation in these patients.
Disclosure of interest: No

CARDIOEMBOLISM & HEART-BRAIN INTERACTIONS

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In young patients with cryptogenic strokes, large vessel occlusions are less frequent in patients with high-risk patent foramen ovale

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Background and aims: Patent foramen ovale (PFO) are present in a significant proportion of "cryptogenic" strokes (CS) in young patients but are not always causal, reason why classifications (RoPE score, PASCAL) have been made to determine the probability that FOP is causal. The presence of an initial arterial occlusion as a prediction factor was however not studied when classifications were built. Our aim was to assess the presence of arterial occlusion in young patients with CS, with and without high-risk PFO.
Methods: From a prospectively-built monocentric database, patients aged 16 to 60 years-old with CS after an extensive and standardized etiological workup, including transesophageal echocardiography, were included. Patients were classified as having High-risk PFO (PFO with a massive shunt (>30 microbubbles) or associated with ASA) or no high-risk PFO (no PFO or small/mild shunt without ASA). Groups were compared with respect to the presence of initial arterial occlusion and large vessel occlusion (LVO).
Results: Ninety-six consecutive patients were included, 55 (57%) having high-risk PFO. Median age was 48 (40-52) years. Initial arterial occlusion and large vessel occlusion were less frequent in the high-risk PFO group compared to the patients without PFO or with non-high risk PFO (respectively 12 (22%) versus 19 (46%), p=0.01, and 4 (7%) versus 16 (39%), p<0.001).
Conclusions: Initial artery occlusions and LVO were less frequently observed in patients with CS and high-risk PFO; it might be a "red flag" for PFO-related CS. This finding could be implemented in future classifications if validated in further studies.
Disclosure of interest: No

CARDIOEMBOLISM & HEART-BRAIN INTERACTIONS

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Prolonged continuous arrhythmias monitoring after PFO closure with Rooti-RX supracutaneous device and loop recorder

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Background and aims: Atrial fibrillation (AF) is the most frequent complication of patent foramen ovale (PFO) closure but other arrhythmia could occur. We aimed to study their frequency with continuous monitoring early after PFO-closure
Methods: Patients undergoing PFO-closure were submitted to 28-days heart rhythm monitoring (7-days pre, 21-days post-closure) with a supracutaneous device (Rooti-RX). Registered parameters: mean-heart rate (HR), AF, supraventricular/ventricular ectopic beats(BESV/BEV), sustained/non-sustained supraventricular(SVT) and ventricular tachycardia (VT). Post closure AF was also evaluated in patients with implanted loop-recorder.
Results: Thirty-one patients have been studied so far, 16 with Rooti-Rx (68,8% male, mean age 49,06 years), 15 with loop-recorder (73,3% males, mean age 68,3). Overall AF was revealed in 7 patients (22.6%) within 3 weeks from closure (three: Gore, two: Cardia-Ultrasept, two: Amplatzer). Other 2 AF events were documented in the second month in patients with loop-recorder.
In patients studied with Rooti-Rx we observed a significant increase of mean, minimum and maximum HR (p=0.004, <0.001, 0.006 respectively); a significant increase of BESV(p=0.041); a non-significant increase of BEV; the onset of non-sustained SVT(43,7%) and VT(18,7%). No pauses were found. No clinical neurological events were reported.
Conclusions: Our preliminary results show that more than one out of five patients undergoing PFO closure develop a transient AF. This is higher than descripted in a wider recently published study (16%)(Guedeney P et al, 2022). The understanding of the frequency, predictors, and embolic potentials of post-closure arrythmias could allow to identify a subgroup

of patients deserving the use of anticoagulants instead of antiplatelets after PFO-closure.
Disclosure of interest: No

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PATENT FORAMEN OVALE (PFO) IN EMBOLIC STROKE OF UNDETERMINED SOURCE (ESUS) PATIENTS: A PROSPECTIVE SINGLE-CENTER COHORT STUDY

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Background and aims: Prolonged cardiac monitoring in patients with embolic stroke of undetermined source (ESUS) is recommended, however type and individual duration of it as well as its impact on re-stroke rate is still on debate. Additionally, current guidelines recommend PFO closure in cryptogenic stroke patients ⩽60 years. However, specific algorithms for long-term cardiac monitoring to detect atrial fibrillation (AF) prior to potential PFO closure in ESUS patients with relevant PFO are not set for now.
Methods: Based on our clinical management algorithm for ESUS patients, eligible patients were equipped with an insertable cardiac monitor (ICM) and enrolled for home monitoring and a subsequent prospective monocenter cohort study.
Results: Between January 2017 and September 2020 346 ESUS patients were enrolled, in which PFO was present in 17% (59). Relevant PFO was diagnosed in 14% (47), whereas 10% (34) of the patients had relevant PFO and where ⩽60 years. N=38 (81%) of the patients with relevant PFO received ICM and AF was detected in two patients prior to intended PFO closure. Overall, re-stroke occured in 7% (4) of the PFO cohort. Relevant PFO was closed in 53% (25) of the patients and AF after PFO closure was detected in eight (32%) patients. Periinterventional AF occurred in one patient.
Conclusions: Herein, descriptive analysis of a well characterized single-center ESUS cohort is presented. We expect that an in-depth analysis considering e.g. time intervals and individual risk factors may contribute to issues regarding optimized diagnostic algorithm in ESUS patients with PFO.
Disclosure of interest: No

CARDIOEMBOLISM & HEART-BRAIN INTERACTIONS

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NEUROIMAGING MARKERS OF CEREBROVASCULAR DISEASE AND COGNITION IN ADULTS WITH MODERATE-GREAT COMPLEXITY CONGENITAL HEART DISEASE

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Background and aims: Epidemiological studies have identified an increased risk of premature stroke and dementia in adults with congenital heart disease (ACHD). We report preliminary results from an ongoing longitudinal study assessing neuroimaging findings and cognition in people with moderate-great complexity ACHD.
Methods: Participants are recruited from a large provincial subspecialty clinic. Individuals aged ⩾18 with moderate-great complexity CHD and without a contraindication to MRI are invited to participate. Participants undergo baseline and Year 3 brain MRI/MRA and annual cognitive assessment with the MoCA and NIH Toolbox-Cognitive Battery.
Results: Eighty-five participants have been recruited since Fall 2020. Of those, 52 (62%) completed one-year follow-up and 4 (5%) completed two-year follow-up. Baseline clinical characteristics for the study population are summarized in Figure 1. Participants with moderate ACHD had better cognitive performance at baseline and at one year than those with great-complexity ACHD (Figure 2). Fewer participants with moderate ACHD had white matter hyperintensities (WMH) and microbleeds (CMB) on baseline neuroimaging (Figure 3). There were numerical improvements between baseline and year 1 in both the moderate- and great-complexity subgroups for both cognitive batteries.

Figure 1. Baseline Participant Characteristics

	N=85
Age in y, mean (SD)	35.89 (10.65)
Range	19-75
Sex, n (%)	
Male	49 (58)
Female	36 (42)
Race-Ethnicity, n (%)	
White	66 (78)
East Asian	5 (6)
South Asian	6 (7)
Hispanic	2 (2)
Other	6 (7)
Highest-Complexity Cardiac Lesion, n(%)	
GREAT COMPLEXITY	19 (22)
D-Transposition of the great arteries	10
Double outlet ventricle	1
Fontan circulation	4
Pulmonary atresia	3
Truncus arteriosus	1
MODERATE COMPLEXITY	66 (78)
Anomalous pulmonary venous return	3
Aortic Coarctation	19
AV septal defect	3
Congenital aortic valve disease	11
Complex tricuspid valve disease	1
Double chamber right ventricle	2
Ebstein anomaly	2
Pulmonary valve regurgitation	5
Pulmonary valve stenosis	3
Subvalvular aortic stenosis	3
Tetralogy of Fallot	9
Ventricular septal defect + aortic or mitral valve disease	3
Ventricular septal defect with outflow obstruction	2
Antithrombotic use, n(%)	
Any	28 (33)
Antiplatelet (with or without anticoagulant)	19 (66)
Anticoagulant (with or without antiplatelet)	16 (55)

Conclusions: Overall, baseline neuroimaging shows a greater-than-expected burden for age of CMB and WMH in the context of previous cardiac surgery. Baseline cognitive performance was worse and burden of neuroimaging findings was higher in those with great-complexity ACHD. Improved cognitive performance across both subgroups and batteries suggests a practice effect. Repeat neuroimaging at Year 3 will assess for incident findings and cognitive performance will be reassessed annually.

Figure 2. Baseline (N = 85) vs Year 1 Follow-up (N = 52) Cognition Scores in Moderate and Severe-Complexity Groups

	Moderate-complexity (N = 65)	Great-complexity (N = 20)	*p-value*
MoCA, mean (SD)			
Baseline	27.43 (2.16)	26.30 (2.41)	**0.05**
Baseline MoCA < 26, n (%)	7 (11)	6 (30)	**0.04**
One year follow-up*	27.98 (1.83)	26.94 (2.79)	0.11
NIHTB-CB T-score, mean (SD)			
Fluid Composite Score			
Baseline†	51.28 (10.43)	45.35 (9.42)	**0.03**
One year follow-up*	55.89 (9.80)	52.36 (12.36)	0.29
Crystallized Composite Score			
Baseline††	52.29 (10.74)	47.90 (9.39)	0.11
One year follow-up*	55.18 (9.65)	48.71 (9.67)	**0.04**
Total Composite Score			
Baseline††	52.57 (9.86)	45.85 (9.04)	**0.008**
One year follow-up*	54.89 (8.02)	49.86 (11.37)	0.08

*Follow-up MoCA testing completed for 52 participants and follow-up NIHTB-CB testing is complete for 38 participants.
† n= 84
†† n = 83

Figure 3. Baseline Neuroimaging Findings for Moderate and Great-complexity Groups (N=75 scans completed

	Moderate-complexity (N=57 scans)	Great-complexity (N=18 scans)	*P-value*
White matter hyperintensity			
Any, n (%)	32 (57)	12 (66)	0.61
Location, n (%)			
Deep white matter	4 (13)	6 (50)	
Periventricular	2 (6)	1 (8)	
Supratentorial	18 (56)	4 (33)	
Other	8 (25)	1 (8)	
Other small vessel disease features, n (% of total scans)			
≥1 Cerebral microbleed	29 (51)	13 (72)	0.19
≥1 Lacunar infarct	1 (2)	2 (11)	
≥1 Embolic infarct	3 (5)	1 (6)	
≥1 Primary hemorrhagic infarct	1 (2)	0 (0)	

Disclosure of interest: No

CARDIOEMBOLISM & HEART-BRAIN INTERACTIONS

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ATRIAL FIBRILLATION DETECTED WITH OUTPATIENT CARDIAC RHYTHM MONITORING IN PATIENTS WITH ISCHEMIC STROKE OR TIA OF UNDETERMINED CAUSE

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Background and aims: Guidelines advise cardiac rhythm monitoring for ⩾3 days to detect atrial fibrillation (AF) in patients with ischemic stroke of undetermined cause. However, the optimal duration of monitoring is unknown. We aimed to determine the AF detection rate during 7 days of outpatient cardiac rhythm-monitoring after ischemic stroke or transient ischemic attack (TIA) of undetermined cause and gain insights into the AF-patients' vascular risk factors.
Methods: Participants from a large tertiary hospital underwent outpatient cardiac rhythm-monitoring after negative standard diagnostic evaluation (i.e., 12-lead electrocardiogram and in-hospital telemetry). Primary outcome was the proportion of patients with newly detected AF.
Results: We examined 373 patients [age: 67.8±11.6 years; women: 166(44.5%); ischemic stroke: 278(74.5%)]. Median monitoring duration was 7 days (IQR 7-7), performed after a median of 36 days (IQR 27-47). AF was detected in 17(4.6%) patients, mostly (53%) on day-1. Within 3 days 73% of AF patients were identified. First AF episodes were detected up to day-7, but median time to AF was 8 hours (IQR 1-81). A significant difference in cardiovascular risk factors [diabetes; hypertension; or age >65 years] existed between the AF and non-AF group, and 12(70.6%) AF patients had ⩾2 risk factors.
Conclusions: After ischemic stroke or TIA of undetermined cause, 7 days of outpatient cardiac rhythm monitoring detected new AF in 4.6% of patients. Patients with AF had significantly more cardiovascular risk factors. About half of new AF episodes occurred during the first monitoring day, and about three quarters during the first 3 days.
Disclosure of interest: Yes

CARDIOEMBOLISM & HEART-BRAIN INTERACTIONS

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Cerebrovascular and Mortality Outcomes Following Left Atrial Appendage Occlusion in Patients with History of Non-Traumatic Intracerebral/Intraspinal Hemorrhage

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Background and aims: Patients with non-valvular atrial fibrillation and nontraumatic intracranial hemorrhage represent a clinical dilemma for optimal anti-thrombotic selection due to elevated risks of bleeding and thromboembolism. In this setting, left atrial appendage occlusion (LAAO) has been used as a therapeutic option for ischemic stroke risk reduction. The current study aims to describe cerebrovascular outcomes of this selected cohort.
Methods: Retrospective review of all cases undergoing LAAO between 1/2015 and 4/2022 completed at a large multi-site academic medical center. Detailed medical records were reviewed for all patients and numerous clinical variables were ascertained for descriptive analysis. The

Table 1. Baseline Characteristics of Patient Undergoing Left Atrial Appendage Occlusion after Non-Traumatic Intracranial/Intraspinal Hemorrhage

	Overall (N=103)
Age, yrs. *Mean (SD)*	78.7 (7.8)
Sex, no. (%)	
Female	35 (34.0%)
Male	68 (66.0%)
Hypertension, no. (%)	
Yes	95 (92.2%)
No	8 (7.8%)
Hyperlipidemia, no. (%)	
Yes	85 (82.5%)
No	18 (17.5%)
Diabetes, no. (%)	
Yes	28 (27.2%)
No	75 (72.8%)
Prior Ischemic Stroke, no. (%)	
Yes	36 (35.0%)
No	67 (65.0%)
Prior Myocardial Infarction, no. (%)	
Yes	17 (16.5%)
No	86 (83.5%)
CHA_2DS_2VASC, score	
≤2	3 (2.9%)
3	21 (20.4%)
4	18 (17.5%)
5	25 (24.3%)
6	27 (26.2%)
7	7 (6.8%)
8	2 (1.9%)
HAS-BLED, score	
1	1 (1.0%)
2	7 (6.8%)
3	33 (32.0%)
4	42 (40.8%)
5	16 (15.5%)
6	4 (3.9%)
Intracranial/Intraspinal Hemorrhage, location	
Lobar	32 (31.1%)
Subcortical/Posterior Fossa	39 (37.9%)
Subdural	20 (19.4%)
Other	12 (11.7%)
Time from Qualifying Hemorrhage to Procedure, days. *(Mean, SD)*	1032 (1651)

Table 2. Cerebrovascular and Mortality Outcomes after Left Atrial Appendage Occlusion in Patients with History of Nontraumatic Intracranial/Intraspinal Hemorrhage.

	Overall (N=103)
Total follow up, days. M*ean (SD)*	1055 (723)
Follow up event, Acute Ischemic Stroke, or Intracranial Hemorrhage	
Yes	12 (11.7%)
No	91 (88.3%)
Long Term Anti-Thrombotic After Appendage Closure	
None	8 (7.8%)
Single Antiplatelet	87 (84.5%)
Dual Antiplatelet	4 (3.9%)
Oral Anticoagulation	3 (2.9%)
Oral Anticoagulation and Antiplatelet	1 (1.0%)
Acute Ischemic Stroke	
Yes	8 (7.8%)
No	95 (92.2%)
Time from Closure to Acute Ischemic Stroke, days. *(Mean) SD*	418 (300)
Acute Ischemic Stroke, Mechanism	
Cardioembolic†	5 (26.3%)
Cryptogenic	2 (10.5%)
Large Artery Atherothrombotic	1 (5.3%)
Acute Ischemic Stroke Risk, %/yr., *annualized*	2.7%
Recurrent Intracerebral Hemorrhage	
Yes	4 (3.9%)
No	99 (96.1%)
Time from Closure to Recurrent Intracerebral Hemorrhage, days. *(Mean) SD*	1571 (518)
Intracranial Hemorrhage Location/Mechanism	
Lobar	1 (1.0%)
Subcortical Posterior Fossa‡	1 (1.0%)
Subdural Hematoma‡	2 (1.9%)
Recurrent Cerebral Hemorrhage Risk, %/yr, *annualized*	1.3%
All-Cause Mortality	
Yes	16 (15.5%)
No	87 (84.5%)
Time from Procedure to Death, days. *Mean (SD)*	912 (708)
All-Cause Mortality Risk, %/yr, *annualized*	5.4%

†Two cases of acute ischemic stroke occurred in periprocedural settings.
‡Three cases of intracranial hemorrhage were traumatic in etiology.

primary outcome was annualized ischemic stroke risk following LAAO. Secondary outcomes included recurrent intracranial hemorrhage and all-cause mortality.

Results: Left atrial appendage occlusion was performed for neurological indications in 261/792 total cases. LAAO was performed for a history of non-traumatic intracranial/intraspinal hemorrhage in 103 patients and were included in this analysis. Baseline demographics are summarized in Table 1. Ischemic stroke after LAAO was observed in 8/103 cases at a mean 418 days for an annualized occurrence of 2.7%/yr. Recurrent intracranial hemorrhage was observed in 4/103 cases at a mean of 1571 days for an annualized recurrence of 1.3%/yr. Mortality was observed in 16/103 cases at a mean of 912 days for an annualized mortality rate of 5.4%/yr. Cerebrovascular outcomes are described in Table 2.

Conclusions: Left atrial appendage occlusion demonstrated low rates of ischemic stroke during follow-up and should be considered for a large prospective study of ischemic stroke risk reduction.

Disclosure of interest: Yes

CARDIOEMBOLISM & HEART-BRAIN INTERACTIONS

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USE OF EXTERNAL AND/OR INSERTABLE CARDIAC MONITORS TO IDENTFY ATRIAL FIBRILLATION POST-STROKE VARIES SIGNIFICANTLY AMONG ACADEMIC AND COMMUNITY HOSPITALS

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Background and aims: Previously, the DiVERT (SeconDary Stroke PreVEntion ThRough Pathway ManagemenT) study showed significant heterogeneity in adjudication of stroke subtype (cryptogenic, large-artery or small-vessel) among community hospitals (CoH) and academic centers (AcC). Understanding of post-stroke cardiac monitoring selection may encourage restructuring of post-stroke workflow protocols and improve AF detection.

Methods: DiVERT characterized cardiac monitoring practices post-stroke at CoH and AcC by assessments of care pathways, stakeholder interviews and review of patient-level data from electronic medical records. Subgroup analysis was pursued to compare use of external (EXT) and/or insertable cardiac monitors (ICM) among 7,632 stroke patients at 12 sites between 2017 and 2019.

Results: CoH diagnosed cryptogenic stroke (93.2%) more often than large-artery (5.4%) or small-vessel (1.4%) stroke and ordered EXT in 1.7%, 1.5% and 1.0% of those patients respectively, and ICM in 4.0%, 1.5% and 2.0%, respectively. Meanwhile, AcC diagnosed stroke subtypes evenly (32.1%, 37.0%, and 29.9%) and ordered EXT in 60.3%, 69.9% and 65.7%, and ICM in 21.8%, 5.1% and 4.8%. All comparisons of monitoring use between AcC and CoH had statistically significant differences for each stroke subtype, except for ICM use in small-vessel stroke.

Conclusions: CoH diagnose more cryptogenic stroke but order fewer EXT and ICM than AcC. AcC diagnose more large-artery stroke and order more EXT and ICM in these patients. Significant variability exists in presumed stroke etiology between hospitals. Standardized, protocolized monitoring strategies that align with guidelines may reduce this

heterogeneity to prevent recurrent stroke. Such workflow discrepancies will be addressed in DiVERT Phase II.

Disclosure of interest: Yes

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Dementia risk in patients with atrial fibrillation receiving oral anticoagulants: A study from Taiwan's National Health Insurance Research Database

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Background and aims: Previous studies have revealed that patients with atrial fibrillation (AF) have up to 44% increased risk of dementia. Oral anticoagulants (OACs) decreased the risk of dementia by 30-40%. Whether the effect of dementia risk reduction is equal among OACs remains equivocal.

We aimed to investigate the dementia risk in AF patients using different OACs.

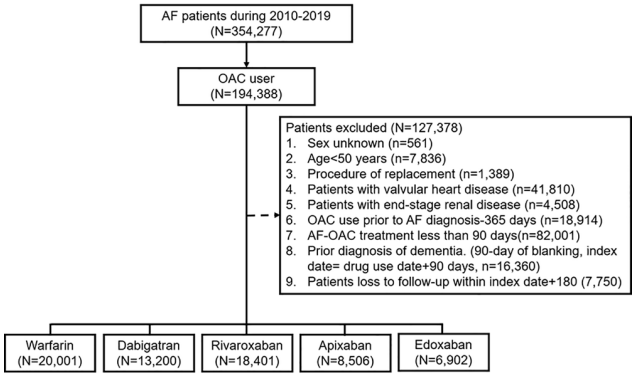
Methods: Data were retrieved from Taiwan's National Health Insurance Research Database. From 2010 to 2019, new users of OACs with AF were identified.

Crude hazard ratios and adjusted hazard ratios of total dementia (TD), degenerative dementia (DD) and vascular dementia (VaD) were calculated. Three different models were applied for comparison.

Results: A total of 354,277 patients with AF were retrieved and 63,948 patients were included in the analysis (Figure 1). Table 1 listed their baseline characteristics. During the follow-up period, 1,615 (2.41%) patients were diagnosed as with dementia. Among them, 1,292 (1.93%) had DD and 464 (0.69%) had VaD.

Table 2 shows the crude hazard ratios and adjusted hazard ratios of each model.

Conclusions: The risk of dementia was generally lower in AF patients taking direct oral anticoagulants (DOACs). The benefit mainly came from the reduction of VaD risk. For individual DOACs, edoxaban had a lower risk of TD compared with warfarin.



Disclosure of interest: Yes

Table 1. Baseline characteristics of study population. Continuous variables are presented as mean(SD).

		Warfarin (n=20001)		DOAC (n=47009)		
		No.	%	No.	%	p value
Age		71.2 (10.4)		74.2 (9.6)		<0.001
	50-64	6417	32.08	7959	16.93	<0.001
	65-79	8977	44.88	25106	53.41	
	over 80	4607	23.06	13944	29.66	
Sex						
	Male	11742	58.71	27321	58.12	0.158
	Female	8259	41.29	19688	41.88	
Underlying condition						
	Ischemic Stroke	5734	28.67	12373	26.32	<0.001
	Systemic Embolism	749	3.74	1134	2.41	<0.001
	Intracranial Haemorrhage	561	2.8	3699	7.87	<0.001
	Myocardial Infarction	1138	5.69	3125	6.65	<0.001
	Peripheral Artery Disease	1362	6.81	3864	8.22	<0.001
	Heart Failure	6699	33.49	15186	32.3	0.003
	Hypertension	16055	80.27	39825	84.72	<0.001
	Diabetes Mellitus	7415	37.07	18895	40.19	<0.001
	Renal Failure	2483	12.41	6879	14.63	<0.001
	Liver Isease	2490	12.45	8266	17.58	<0.001
	Parkinsonism	528	2.64	1563	3.32	<0.001
	Hypothyroidism	411	2.05	1258	2.68	<0.001
	Hyperthyroidism	780	3.9	1934	4.11	0.198
	Chronic Obstructive Pulmonary Disea	6500	32.5	18459	39.27	<0.001
	Cancer	1844	9.22	6022	12.81	<0.001
	Coronary Artery Disease	9419	47.09	22081	46.97	0.774
	Depression	245	1.22	716	1.52	0.003
	Epilepsy	277	1.38	696	1.48	0.344
	Influenza	1363	6.81	41889	8.91	<0.001
	Varicella Zoster Virus Infection	7	0.03	17	0.04	0.942
	Pneumonia	4982	24.91	14512	30.87	<0.001
Medication						
	Aspirin	6900	34.5	17288	36.78	<0.001
	Plavix	1018	5.09	3710	7.89	<0.001
	Acei Or Arb	8989	44.94	23539	50.07	<0.001
	Statin	5034	25.17	15690	33.38	<0.001
	Beta Blocker	7426	37.13	17936	38.15	0.012
	Class I Or Iii Anti-Arrhythmic	2280	11.4	6411	13.64	<0.001
	Digoxin	1466	7.33	2202	4.68	<0.001
	Diuretics	4276	21.38	8118	17.27	<0.001
	Calcium Channel Blocker	7764	38.82	17450	37.12	<0.001
	Anti-Epileptics	962	4.81	2481	5.28	0.012
	Anti-Parkinsonism	354	1.77	1048	2.23	0.000
	Anti-Psychotics	353	1.76	887	1.89	0.284
	Anxiolytics	3336	16.68	8287	17.63	0.003
	Hypnotics And Sedatives	1966	9.83	4825	10.26	0.088
	Anti-Depressants	963	4.81	2395	5.09	0.128
	Thyroid Preparations	373	1.86	1019	2.17	0.012
	Antithyroid Preparations	282	1.41	579	1.23	0.061

Table 2. Risk of dementia comparing users of different OACs among patients with AF.

Table2-1. The risk of dementia					
		Crude HR (95%CI)	p value	Adjusted HR (95%CI)	p value
Mode1	DOAC vs. Warfarin	1.094 (0.981-1.221)	0.106	0.911 (0.814-1.02)	0.106
Mode2	Dabigatran vs. Warfarin	1.092 (0.948-1.257)	0.221	0.970 (0.841-1.120)	0.678
	Other DOAC vs. Warfarin	1.095 (0.976-1.229)	0.122	0.887 (0.787-0.999)	0.049
Model3	Dabigatran vs. Warfarin	1.092 90.948-1.257)	0.222	0.969 (0.840-1.119)	0.669
	Rivaroxaban vs. Warfarin	1.124 (0.989-1.2778)	0.074	0.920 (0.807-1.049)	0.212
	Apixaban vs. Warfarin	1.152 (0.978-1.359)	0.091	0.869 (0.734-1.028)	0.102
	Edoxaban vs. Warfarin	0.916 (0.748-1.122)	0.395	0.788 (0.641-0.969)	0.024
Table2-2. The risk of Degenerative dementias					
		Crude HR (95%CI)	p value	Adjusted HR (95%CI)	p value
Mode1	DOAC vs. Warfarin	1.174 (1.037-1.329)	0.011	0.934 (0.821-1.061)	0.293
Mode2	Dabigatran vs. Warfarin	1.162 (0.991-1.362)	0.064	1.008 (0.858-1.185)	0.921
	Other DOAC vs. Warfarin	1.180 (1.035-1.344)	0.013	0.904 (0.790-1.035)	0.144
Model3	Dabigatran vs. Warfarin	1.162 (0.991-1.362)	0.064	1.008 (0.857-1.185)	0.925
	Rivaroxaban vs. Warfarin	1.175 (1.016-1.359)	0.030	0.912 (0.786-1.058)	0.222
	Apixaban vs. Warfarin	1.287 (1.073-1.543)	0.007	0.928 (0.771-1.118)	0.434
	Edoxaban vs. Warfarin	1.044 (0.836-1.303)	0.705	0.837 (0.668-1.049)	0.123
Table2-3. The risk of Vascular dementia					
		Crude HR (95%CI)	p value	Adjusted HR (95%CI)	p value
Mode1	DOAC vs. Warfarin	0.761 (0.628-0.921)	0.005	0.737 (0.04-0.900)	0.003
Mode2	Dabigatran vs. Warfarin	0.755 (0.582-0.980)	0.035	0.763 (0.621-0.937)	0.010
	Other DOAC vs. Warfarin	0.719 (0.552-0.937)	0.015	0.746 (0.601-0.926)	0.008
Model3	Dabigatran vs. Warfarin	0.755 (0.582-0.979)	0.034	0.716 (0.550-0.934)	0.014
	Rivaroxaban vs. Warfarin	0.859 (0.685-1.078)	0.190	0.844 (0.668-1.067)	0.157
	Apixaban vs. Warfarin	0.724 (0.524-1.000)	0.050	0.644 (0.462-0.896)	0.009
	Edoxaban vs. Warfarin	0.484 (0.312-0.751)	0.001	0.522 (0.334-0.815)	0.004

CARDIOEMBOLISM & HEART-BRAIN INTERACTIONS

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Estimated vs. measured creatine clearance to predict the plasma levels of direct oral anticoagulants after stroke

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Background and aims: Doses of direct oral anticoagulants (DOAC) should be adjusted to the renal function reflected by the creatinine clearance (CrCl). In most previous clinical trials, the Cockcroft-Gault formula was used to estimate the CrCl (eCrCl). It is unclear, whether CrCl measured from the 24-h urine collection (mCrCl) better reflects the renal function and therefore predicts the DOAC plasma concentration more reliably.

Methods: Cardioembolic stroke patients with AF on treatment with DOAC were enrolled. eCrCl was estimated using the Cockcroft-Gault formula. In addition, mCrCl was measured by 24-hour urine collection. The plasma trough levels of DOAC were measured 12±1 hours (for apixaban and dabigatran) or 24±1 hours (for edoxaban and rivaroxaban) after DOAC-intake. Correlations between plasma levels of DOAC and CrCl were assessed using the Pearson correlation test.

Results: Data were available in 224 patients. In all 224 patients, both the eCrCl and the mCrCl significantly correlated with trough DOAC levels (eCrCl: correlation coefficient -0.303, $P<0.001$; mCrCl: correlation coefficient -0.294, $P<0.001$). In the subgroup of patients with eCrCl $\geq$ 90 ml/min, only mCrCl significantly correlated with tough DOAC levels (correlation coefficient -0.298, P=0.032).

Conclusions: For the majority of patients with cardioembolic stroke, the estimated CrCl was equally reliable for the prediction of DOAC plasma levels compared to the measured CrCl-values based on 24-h-urine collection. In patients with estimated CrCl $\geq$ 90 ml/min, the measured CrCl from the 24-hour urine collection might be superior.

Disclosure of interest: No

CARDIOEMBOLISM & HEART-BRAIN INTERACTIONS

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Biomarkers Predictive of Atrial Fibrillation in Patients with Cryptogenic Stroke. Insights from The NOR-FIB Study

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Background and aims: There are currently no biomarkers used to select cryptogenic stroke (CS) patients for monitoring with insertable cardiac monitors (ICMs), the most effective tool for diagnosing atrial fibrillation (AF) in CS. The purpose of this study was to assess clinically available biomarkers as predictors of AF.

Methods: Eligible CS and cryptogenic transient ischemic attack (TIA) patients underwent 12-month monitoring with ICMs, clinical follow-up, and biomarker sampling. Levels of cardiac and thromboembolic biomarkers, taken within 14 days from symptom onset, were compared between patients diagnosed with AF (n=74) during monitoring and those without AF (n=185). Receiver operating characteristic (ROC) curves were created. Biomarkers reaching area under ROC curve (AUC) $\geq$ 0.7 were dichotomized by finding optimal cut-off values and used in logistic regression establishing their predictive value for increased risk of AF in unadjusted and adjusted models.

Results: B-type natriuretic peptide (BNP), N-terminal pro-brain natriuretic peptide (NT-proBNP), creatine kinase, D-dimer, high-sensitivity cardiac Troponin I and T were significantly higher in the AF than non-AF group. BNP and NT-proBNP reached predefined AUC level, 0.755 and 0.725 respectively. Optimal cut-off values were 33.5 ng/L for BNP, and 87 ng/L for NT-proBNP. Regression analysis showed that NT-proBNP was predictor of AF in both unadjusted, odds ratio (OR) 7.72 (95% confidence interval [CI] 3.16–18.87), and age and sex adjusted models, OR 4.82 (95% CI 1.79–12.96).

Conclusions: Several clinically established biomarkers were associated with AF. NT-proBNP performed best as AF predictor and could be used for selecting patients for monitoring with ICMs.

Disclosure of interest: Yes

INTRACEREBRAL HAEMORRHAGE

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Impacts of cerebral Small Vessel Disease on the Features of Hematoma and Hematoma Expansion in Intracerebral Haemorrhage

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Background and aims: Several early noncontrast CT (NCCT) signs of the shape or density of intracerebral hemorrhage (ICH) can predict hematoma expansion (HE). We aim to We aim to investigate whether the severity of small vessel disease (SVD) is associated with early NCCT signs and risk of HE.
Methods: We analyzed all patients with spontaneous, supratentorial ICH between 2016-2020 from a comprehensive stroke center. Early NCCT signs were classified into shape or density signs. HE was defined as an increase in hematoma volume ⩾6 ml or 33% from baseline. The severity of SVD was evaluated by CT-based (3-point) and MRI-based (4-point) SVD scores. The associations between SVD score and hematoma volume, NCCT signs and HE were examined.
Results: A total of 509 patients (median 64 years; female 38%) were included, and 328 had MRI available. Higher SVD scores, especially MRI-SVD scores, were associated with smaller ICH volumes, fewer shape or density signs **(Figure 1)**. Overall, 22% of the patients had HE. A higher MRI-SVD score was inversely associated with HE (adjusted odds ratio 0.71, 95% CI 0.53 – 0.96). In the subgroup analysis, the effect was mainly seen in the patients who were younger (< 65 years), male, had deep hemorrhage, or did not meet the cerebral amyloid angiopathy diagnosis **(Figure 2)**.
Conclusions: In spontaneous ICH patients, more severe SVD was associated with lower hematoma volume, fewer NCCT signs and lower risks of HE. Different underlying SVD pathologies may have distinct impacts on the ICH outcomes.

Figure 1.

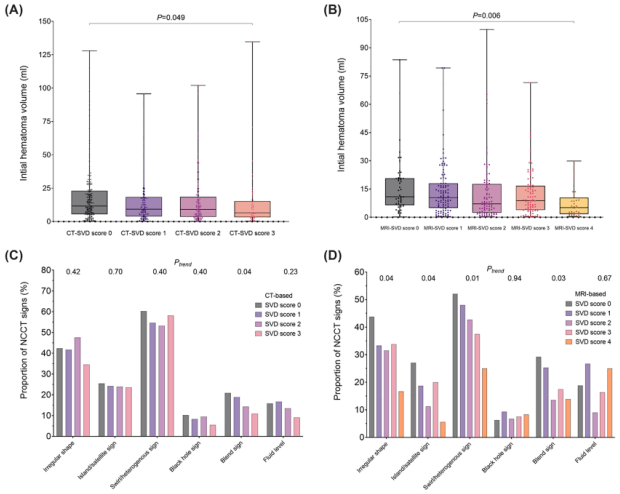
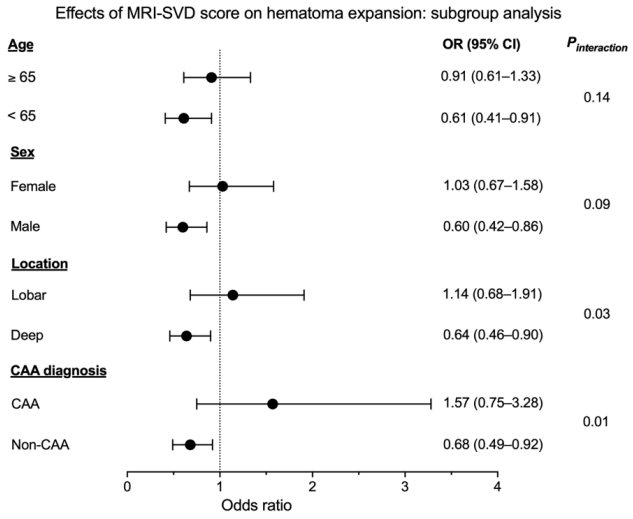


Figure 2.



Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

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EFFECTS OF MADRID-DIRECT PREHOSPITAL SCALE TRIAGE IN PATIENTS WITH INTRACEREBRAL HEMORRHAGE

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Background and aims: Prehospital stroke scales have shown to reduce onset-to-treatment times in patients with large vessel occlusion (LVO). However, patients with severe intracerebral hemorrhage (ICH) are usually classified as LVO. Blood pressure evaluation in the Madrid-DIRECT scale has shown to reduce false positives due to ICH. We aimed to assess the influence of Madrid-DIRECT triage in the outcomes of patients with ICH.
Methods: Post-hoc analysis of the Madrid-DIRECT study, including ICH patients. We compared demographic characteristics, stroke severity (initial NIHSS) and proportion of favourable outcomes (modified Rankin Scale <=3) at 3 months and at 1 year between Mothership –direct transfer to thrombectomy hospital (TH)– and Madrid-DIRECT cohorts (direct transfer to TH for score >=2, or to non-TH for <2). The subset of patients with severe ICH (NIHSS>=10) was analysed.

Results: Of 541 Stroke Code patients, 73 (13.5%) had an ICH, 50 of them (68%) severe. Baseline characteristics were similar in both cohorts. In the Mothership cohort, all 23 patients with severe ICH were directly transferred to TH. In the Madrid-DIRECT cohort, 16 out of 27 (59%) patients with severe ICH scored >=2 and were directly transferred to TH. We found no significant differences in the proportion of favourable outcomes at 3 months between mothership and Madrid-DIRECT cohorts (32.3% vs 38.1%) nor among patients with severe ICH (21.7% vs 22.2%), neither at 1 year.
Conclusions: Madrid-DIRECT scale allows to rule out a significant proportion of patients with severe ICH and does not seem to compromise their outcomes in our Network.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

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MRI-defined cerebral small vessel disease markers for risk assessment of recurrent intracerebral haemorrhage

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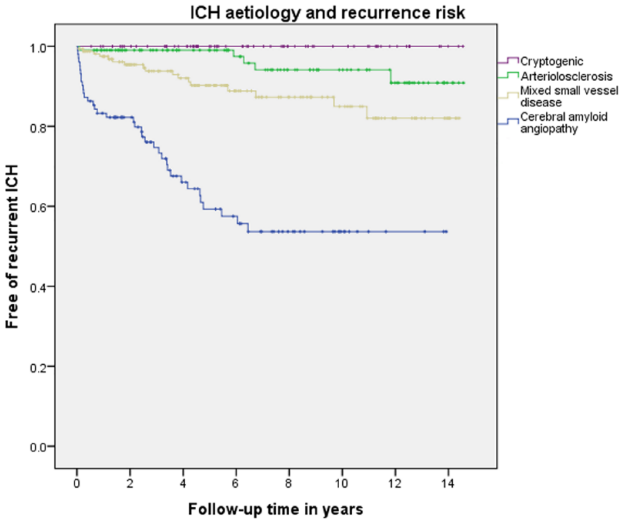
Background and aims: Assessing the risk of recurrent intracerebral haemorrhage (ICH) is of high clinical importance. MRI-based cerebral small vessel disease (SVD) markers may help establish ICH aetiology and recurrence risk.
Methods: We investigated the risk of recurrent ICH in a large cohort of consecutive ICH survivors with available MRI at baseline. Patients with macrovascular, structural or other identified causes of ICH other than SVD were excluded. ICH aetiology was defined as cerebral amyloid angiopathy (CAA), arteriolosclerosis, mixed SVD and cryptogenic (i.e., no MRI markers of SVD). Recurrent ICH was determined using electronic health records and confirmed by neuroimaging.
Results: Of 443 patients with ICH (mean age 67±13 years, 41% female), ICH aetiology was mixed SVD in 36.7%, arteriolosclerosis in 23.6%, CAA in 23.0%, and cryptogenic in 16.7%. During a mean follow-up period of 6.5±4.2 years (2682 patient-years), recurrent ICH occurred in 59 individual patients (13.3%). The highest recurrence rate per 100 person-years was found in patients with CAA (8.5; 95% CI, 6.1-11.7), followed by mixed SVD (1.8; 95% CI, 1.1-2.9) and arteriolosclerosis (0.6; 95% CI, 0.3-1.5). No recurrent ICH occurred in patients with cryptogenic ICH during 510 person-years follow-up (97.5% CI, 0-0.7); this finding was confirmed in an independent cohort (CROMIS-2 ICH, n=216) in which there was also no recurrent ICH in patients with cryptogenic ICH.
Conclusions: MRI-based aetiological subtypes are helpful in determining the recurrence risk of ICH; while the highest recurrence risk was found in CAA, recurrence risk was low for arteriolosclerosis, and negligible for cryptogenic ICH.



Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

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CORTICAL MICROINFARCTS AND AMYLOID DEPOSITION IN PRIMARY INTRACEREBRAL HEMORRHAGES: A PIB-PET STUDY

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Background and aims: Primary intracerebral hemorrhages (ICHs) are mainly caused by small vessel disease (SVD) including hypertension (HTN) or cerebral amyloid angiopathy (CAA). Cortical microinfarct (CMI) is a recently identified SVD marker, and we aimed to analyze whether CMIs are associated with CAA and predict worse cognitive outcome independent of amyloid deposition.
Methods: 133 primary ICH survivors were recruited for brain MRI and PiB-PET scans. CAA was diagnosed using Boston Criteria 2.0. Neuroimaging markers including CMIs were evaluated according to established criteria. PiB-PET data were expressed as the global standardized uptake value ratios (SUVRs) using cerebellar cortex as reference. The cognition was followed up using MMSE and CDR in 64 patients with a median of 3.5 years (IQR 2.0-6.2).
Results: 35 CAA and 92 non-CAA ICHs were included. Compared to patients without CMI, patients with CMI (n=48) had a higher prevalence of CAA-ICH (41.7% vs. 19.0%, P=0.008) and PiB SUVR (1.13 vs. 1.06, P=0.020). Presence of CMI was independently associated with CAA-ICH (OR 3.85, P=0.014). Patients with CMI had worse cognitive outcome (dementia conversion or MMSE decline ⩾ 2, HR 2.43, P=0.049), independent of PiB SUVR and other imaging markers. In mixed-ICH with both lobar and deep bleeds (n=69), presence of CMI (P=0.015) and number CMIs (β=0.0385, P=0.001) were both associated with higher PiB SUVR.
Conclusions: In primary ICH, CMI is a potential marker for underlying CAA and an independent predictor for worse cognitive outcome. For mixed-ICH with undetermined SVDs, CMI may have value in identifying concomitant CAA.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

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IMPACT OF PREHOSPITAL STROKE TRIAGE IMPLEMENTATION ON PATIENTS WITH INTRACEREBRAL HAEMORRHAGE

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Background and aims: Little is known about how prehospital triage using large vessel occlusion (LVO) stroke prediction scales affects patients with intracerebral haemorrhage (ICH). We aimed to investigate whether the Stockholm Stroke Triage System (SSTS) implemented in 2017, has affected timing and outcomes of acute ICH neurosurgery, and to assess system triage accuracy for ICH with a neurosurgical indication or LVO thrombectomy.
Methods: In the Stockholm Region, we compared surgical timing, functional outcome and death at 3 months, in patients transported by code-stroke ground ambulance who had ICH neurosurgery, 2 years before versus 2 years after SSTS implementation. We also calculated triage precision metrics for treatment with either ICH neurosurgery or thrombectomy.
Results: A total of 36 patients undergoing ICH neurosurgery were included before SSTS implementation and 30 after. No significant difference was found in timing of neurosurgery (median 7.5 (4.9-20.7) vs 9.1 (6.1-12.5) hours after onset), distribution of functional outcomes (median 4 vs 4), and death at 3 months (3/29 (9%) vs 5/35 (17%) before vs after implementation respectively. The SSTS routed a larger proportion of patients subsequently undergoing ICH neurosurgery directly to the comprehensive stroke centre: 13/36 (36%) before vs 18/30 (60%) after implementation. Overall system triage accuracy for ICH neurosurgery or thrombectomy was high at 90%, with 92% specificity and 65% sensitivity.
Conclusions: The SSTS, initially designed for prehospital LVO stroke triage, routed more patients with neurosurgical indication for ICH directly to the comprehensive stroke centre. This did not significantly affect surgical timing or outcomes.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

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Impact of untreated hypertension in acute spontaneous intracerebral hemorrhage: a multicenter prospective study

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Background and aims: Hypertension is a high risk for spontaneous intracerebral hemorrhage (SICH). Although untreated hypertension (UHT) before SICH is often observed, its prevalence and clinical impact remain unclear.
Methods: This is a multicenter prospective registry of acute SICH to study blood pressure (BP) management before SICH and its relation to the outcome, using a patient questionnaire from August 2019 to June 2022 in 6 stroke centers in Tochigi, Japan.
Results: 366 patients were included. The mean age was 68.5 years, 60.6% were male, and 20.7% used antithrombotic medication before SICH. Pre-existing hypertension was found in 78.1%, of which 51.6% had UHT. We classified by age ($<$55, 55-64, 65-74, and $\geqslant$75 years), and the proportion of patients with pre-existing hypertension was high (73.9%, 84.2%, 75.8%, and 78.6%) in all ages. UHT was more common in younger patients (79.7%, 60.5%, 52.6%, and 30.2%, $P<0.0001$). In patients, who had been receiving anti-hypertensive medication, the achievement rate of recommended BP of $<$130/80 mmHg (cerebrovascular disease, coronary artery disease, diabetes, and antithrombotic use) were 0%, 14.3%, 16.7%, and 28.2%, respectively. The achievement rate of the recommended BP of $<$140/90 mmHg was 0%, 28.6%, 28.6%, and 52.6%. In-hospital mortality was higher in younger patients (age$<$65) with UHT than non-UHT (8.0% vs. 2.3%, P=0.2) but not in elderly patients (2.4% vs. 5.6%, P=0.27).
Conclusions: Among patients with SICH, UHT was much higher in younger patients and may be associated with in-hospital mortality. The achievement of BP control before SICH was quite low in all ages.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

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DIURNAL VARIABILITY OF PERIHEMATOMAL EDEMA IN PATIENTS WITH SPONTANEOUS INTRACEREBRAL HEMORRHAGE

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Background and aims: Diurnal variations in the incidence of intracerebral hemorrhage (ICH), hematoma expansion, and blood-brain-barrier transport system have been reported. We aimed to examine whether perihematomal edema (PHE) and its expansion also exhibit diurnal variability.
Methods: We conducted a secondary analysis of the patient data set from the i-DEF (Deferoxamine in intracerebral hemorrhage) trial. 293 patients with spontaneous ICH were categorized into two groups based on the time of onset of symptoms—Day (from 0800 to 2000) and night (from 2000 to 0800 h). Various imaging measures of PHE (absolute PHE, relative PHE, Edema expansion distance (EED) and rate of PHE growth) on the baseline and repeat CT scans at 72-96h were pooled and analyzed.
Results: ICH onset occurred during the day period in 188 patients vs. 105 during the night period. No significant differences were observed in baseline absolute PHE volume (15.34 vs. 14.94 ml p=0.75), relative PHE volume (1.14 vs. 1.22 ml; p=0.78), Edema extension distance (EED (0.44

vs. 0.44cm; p=0.86) between the two groups. Similarly, the changes in absolute PHE (7.78 vs 8.45 ml p=0.59), relative PHE (0.77 vs 0.83 ml p=0.17), EED (0.20 vs. 0.22 cm; p=0.24), and rate of PHE growth (0.095 ml vs 0.11 ml 0.44) after 72-96h did not differ between the two groups.
Conclusions: We found no evidence for a diurnal variability in various measures of PHE and its progression in this cohort of patients with spontaneous ICH.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

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INTEGRATED MASS CYTOMETRY ACCURATELY PREDICTS HEMORRHAGIC TRANSFORMATION IN ACUTE ISCHAEMIC STROKE PATIENTS TREATED WITH ENDOVASCULAR THERAPY

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Background and aims: Hemorrhagic transformation (HT) is a major modifiable predictor of poor outcome after the endovascular treatment (EVT) of acute ischemic stroke (AIS). Inflammatory processes resulting in persistent microcirculation thrombosis and blood-brain-barrier leakage are critical to HT pathogenesis. We aim to characterize the dynamic changes of single-cell immune responses associated with HT after EVT.
Methods: Twenty patients were enrolled in a single-center prospective study. Arterial and venous whole blood samples were collected before and after EVT (figure). High-dimensional mass cytometry immunoassay assessed the frequency and intracellular signaling responses of major immune cell subsets. Multivariate predictive modeling of HT was performed using sparse machine learning algorithm (STABL) and predictive performance evaluated with cross-validation (Figure 1)
Results: One multivariate model integrating single-cell data from sample collected before EVT accurately classified the 10 patients who developed HT (AUC of 0.92 and p=0.0017). mTOR signaling pathway involving prpS6 in Th1 CD4+T cells and neutrophils, was markedly increased in patients who developed HT.
Conclusions: The single cell analysis of immune signaling responses assessed in pre-EVT peripheral blood sample revealed a systemic immune signature predictive of HT. This promising patented approach will be developed to identify predictive biomarkers and therapeutic targets to improve clinical response to endovascular reperfusion.

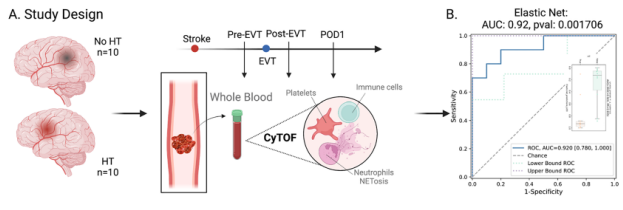

Figure 1.

Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

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Prediction of functional outcome in patients with intracerebral hemorrhage: a comparison of five prognostic scales

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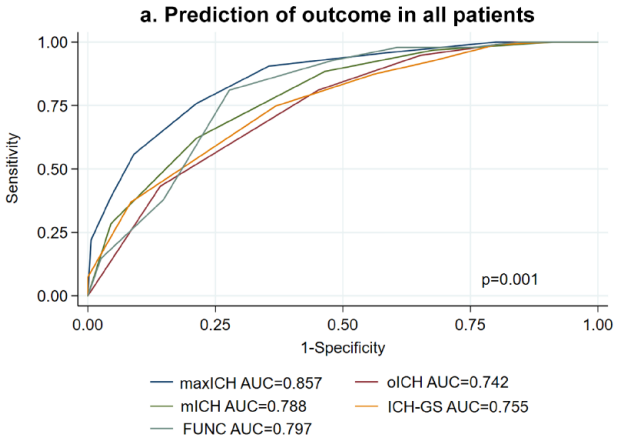
Background and aims: Several prognostic scores have been designed to predict mortality in patients with intracerebral hemorrhage (ICH). However, the reliability of these scores to predict functional outcome in maximally treated patients with ICH is not well-stablished. We aimed to assess the ability to predict functional outcome of the five more commonly used ICH prognostic scales.
Methods: Prospective observational study including all consecutive functionally independent (modified Rankin Scale, mRS⩽3) patients with spontaneous ICH admitted within the first 24h from symptom-onset at a Comprehensive Stroke Centre (March 2020 - April 2022). Original ICH score (oICH), modified ICH score (mICH), ICH grading score (ICH-GS), max-ICH score and FUNC score were calculated at admission. Primary outcome was area under the receiver operating characteristic curve (AUC) for good functional outcome, defined as mRS⩽3 at 90 days.
Results: We included 250 patients: age 70.5 (SD 14.2) years, 87 (34.8%) women, median NIHSS 15 (IQR, 6 – 22) and median ICH volume 19 (IQR, 6.8 – 50.5) ml. Withdrawal of care within the first 24h was applied to 32 (12.8%) patients. Prognostic performance of all scores for good functional outcome showed an AUC range of 0.700 – 0.857. Max-ICH score had significant better prognostic performance than all other prognostic scales (Figure 1).
Conclusions: Direct comparison between five ICH prognostic scales showed that max-ICH score had the best accuracy to predict functional outcome in patients with ICH.



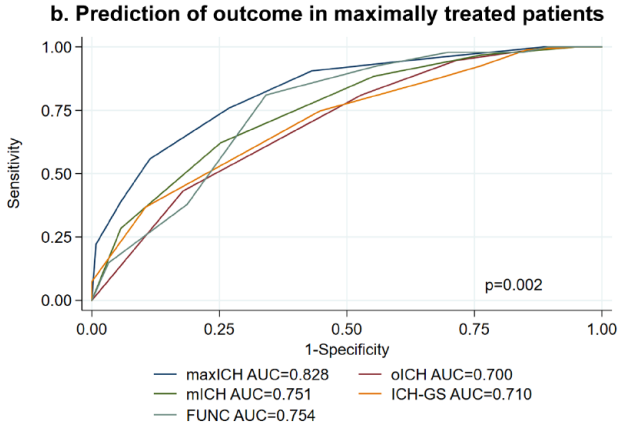


Figure 1. ROC curves for good functional outcome

Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

1063

PREDICTION OF FUNCTIONAL OUTCOME IN SUPRATENTORIAL INTRACEREBRAL HEMORRHAGE PATIENTS TREATED WITH STERETOTECTIC COMPUTED TOMOGRAPHIC-GUIDED ASPIRATION AND RECOMBINANT TISSUE PLASMINOGEN ACTIVATOR (R-TPA)

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Background and aims: Minimally invasive surgery for ICH has shown a significantly improved functional outcome for selected ICH patients. This study aimed to evaluate the factors influencing the outcome of supratentorial ICH patients treated with stereotactic computed tomographic (CT) guided recombinant tissue plasminogen activator (r-TPA).
Methods: We retrospectively evaluated data from 80 consecutive supratentorial ICH patients between December 2017 and July 2020, analyzing their 180-day outcomes, and identifying clinical, radiological factors for good prognosis within 180 days.
Results: The mean age was 55.6 years (SD 11.4). The median pre-operation Glasgow Coma Scale (GCS) score was 9 (interquartile range - IQR 6-12). The mean final ICH volume was 26.5ml (SD 27.5), with ICH volume reduction by an average of 60.8%. Six months after the procedure, 40 patients (50%) had favorable outcomes (modified Rankin Scale [mRS]) score 0-3). In multivariate analysis, age (odds ratio [OR] = 0.939, 95% confidence interval (CI) = 0.894 – 0.986; p = 0.012), the GCS score before operation (OR = 1.525, 95% CI = 1.008 – 2.309; p = 0.046) were the significant predictors of a favorable 180-day outcome. Receiver operating characteristic curve analysis confirmed that the best cut-off point for predicting the good functional 180-day outcome was a pre-operation GCS score of 9 [area under the curve: 0.721, 95% CI = 0.608 – 0.833, p = 0.001].
Conclusions: CT-guided thrombolysis and aspiration can be safe and effective in reducing ICH volume. A pre-operation GCS score of 9 was associated with improved long-term outcomes in young patients with supratentorial ICH.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

1145

HC-ICH score: a new tool to predict mortality after spontaneous intracerebral haemorrhage

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Background and aims: The ICH score is a simple and widely used tool for the prediction of mortality associated with spontaneous intracerebral haemorrhage (ICH). However, its predictive ability is suboptimal.
The aim of the study is to develop a new predictive score and compare it with the ICH score.
Methods: All patients with ICH admitted to two stroke units in the Community of Madrid between January 2020 and September 2022 were reviewed. The endpoint was 30-day mortality rate.
Independent predictors of 30-day mortality were identified by logistic regression. A risk stratification score (HC-ICH score) was developed with weighting of independent predictors according to their degree of association.
Results: 213 patients were analyzed with an overall 30-day mortality rate of 19.05%. Factors independently associated in multivariate analysis were age, clinical severity according to the National Institutes Health Stroke Scale, ICH volume weighted by location (lobar vs. basal ganglia), level of consciousness impairment and presence of hydrocephalus. The scale obtained has a range of scores between 0 and 9 points. Mortality at 30 days was significantly associated with the score on the HC-ICH ($p < 0.001$). The area under the curve of the HC-ICH score was 0.917 (0.868-0.966), being significantly better (p=0.01) than the ICH score 0.856 (0.801-0.911).
Conclusions: The HC-ICH score prediction of 30-day mortality rate was statistically superior to the ICH score.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

1243

LONG-TERM EFFECTS OF TRANEXAMIC ACID IN A MOUSE MODEL OF AMYLOID DISEASE: SETTING THE STAGE FOR A NOVEL TREATMENT APPROACH IN CEREBRAL AMYLOID ANGIOPATHY

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Background and aims: Amyloid, like fibrin, activates the fibrinolytic system. Plasmin has a role in amyloid removal. Since plasmin can promote intracerebral haemorrhage (ICH), tranexamic acid (TXA), which blocks plasminogen activation, may reduce ICH in patients with cerebral amyloid angiopathy (CAA). As TXA might inadvertently increase brain amyloid-beta (Aβ), we investigated the biodistribution and long-term consequences of TXA on brain Aβ levels, inflammation and neurological

function in APP/PS1 mice that overexpress Aβ and their wild-type littermates.
Methods: Mice (8-10 week old) were randomised to TXA (20 mg/mL) or placebo in drinking water for 2-weeks (biodistribution) or 6-months (neurological evaluation). TXA levels in plasma and various organs was determined by LCMS. Amidolytic assays were used for plasma fibrinolytic activity. Brain Aβ plaques were assessed by immunohistochemistry. Neurological tests included spatial memory (Y-Maze) and motor coordination (Parallel Rod floor). Proximity ligation-based immunoassays were used to quantitate 92 biomarkers of inflammation.
Results: Oral TXA effectively inhibited plasma fibrinolysis. TXA accumulated in the kidney with 30-85% lower levels in the lung, liver and spleen. Brain TXA levels were ~70-fold lower. All cohorts showed a decrease in motor activities and novelty preference due to aging but no adverse effect by TXA. Brain Aβ levels remained unchanged. TXA altered plasma levels of two of the 92 biomarker tested (CCL20 decreased and EpCAM increased).
Conclusions: Long-term TXA treatment did not alter brain Aβ levels or influence neurological behaviour. Our safety study supports further evaluation of TXA as a novel ICH prevention treatment in people with symptomatic CAA.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

1339

BACTERIAL TRANSLOCATION AFTER HEMORRHAGIC STROKE. DETECTION BY MRI, EFFECT OF HEMATOMA SIZE AND ITS INFLAMMATORY CONSEQUENCES

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Background and aims: Hemorrhagic Stroke (HS) is one of the most devastating types of Cerebrovascular Disease. One of the most frequent complications after stroke is the development of infections. In this setting, it has been demonstrated only in ischemic stroke, gut barrier damage (GBD), bacterial translocation (BT), alterations in the immune response, processes that favor the occurrence of infections. In addition, the use of imaging techniques would be very useful to early detect these processes. Therefore, we explored the effect of the hematoma size in GBD/BT, their inflammatory consequences and we have developed a new MRI-protocol to detect these processes.
Methods: In naïve and at 72h in sham/HS two-months old male Wistar-rats, we determined the GBD by T1W-images enhanced with mannitol+ $MnCl_2$ as contrast agents (CA), hematoma volume in T2W-images, BT by microbiological culture and different immune cell populations by flow cytometry.
Results: Our results showed that hematoma size determined the BT, by increasing this process from 62% of BT after moderate HS vs. 100% of BT after severe HS. Our GBD-MRI-protocol was able to detect CA extravasation inside the peritoneal cavity in the same animals that underwent BT. In addition, GBD/BT after HS altered the T, B lymphocytes and neutrophils populations in different organs.
Conclusions: Our study shows that the greater is the severity of HS, higher is the occurrence of GBD/BT and more altered is the immune response. Furthermore, our GBD-MRI protocol suggests that it would be very useful to detect this process early and noninvasively in stroke patients.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

1494

Influence of bundled care treatment on functional outcome in patients with intracerebral haemorrhage

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Background and aims: The guideline-recommended treatment in patients with intracerebral haemorrhage compromises blood pressure-, temperature- and glucose management. The associations of such a "care bundle" consisting of early intensive blood pressure lowering, glycaemic control, treatment of pyrexia with clinical outcome is still elusive. The present study investigated whether achieving these parameters as care bundle over the first 72 hours may have beneficial associations with functional outcome in patients with intracerebral haemorrhage (ICH).
Methods: We investigated bundled care treatment (BCT) consisting of systolic blood pressure (110-160mmHg)-, glucose (80-180mg/dl)- and temperature- (35.5-37.5°C) control in patients with primary spontaneous ICH. The primary endpoint was favourable functional outcome at 12 months defined by modified Rankin Scale(mRS 0-3), secondary outcomes were defined as mortality at 12 months, occurrence of hematoma enlargement(HE) and oedema volume(PHE). Confounding was addressed by doubly-robust-methodology to calculate absolute treatment effects.
Results: After evaluation, 182 patients achieved all three BCT criteria and were compared to 499 controls (non-BCT). The adjusted absolute treatment effect of BCT to achieve the primary outcome was 9.3%, 95%CI(1.7 to 16.9), $p<0.001$. Among secondary outcomes, mortality at 12 months was reduced with a significant absolute treatment effect for BCT(-12.8%, 95%CI(-10.8% to -5.7%), $p<0.001$). No association for BCT with either hematoma expansion or peri-haemorrhagic oedema progression was observed. Significant BCT-drivers of this treatment effect were blood pressure control and treatment of pyrexia.
Conclusions: Strict adherence to this "care bundle" over the first 72 hours in patients with ICH was significantly associated with improved functional outcome, strongly warranting prospective validation.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

1621

STATIN CONTINUATION AND OUTCOME IN PATIENTS WITH LOBAR INTRACEREBRAL HAEMORRHAGE. A RETROSPECTIVE COHORT STUDY

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Background and aims: Statins prevent vascular events. However, they have antiplatelet, anticoagulant and fibrinolytic effects that may increase the risk of intracerebral haemorrhage (ICH) recurrence, especially in lobar ICH. This study investigated the prognostic impact of statin continuation after spontaneous lobar ICH.
Methods: Retrospective observational study on a prospective database. We included consecutive patients with lobar ICH (2013-2019) admitted to a comprehensive stroke centre. We excluded patients with functional dependence (mRS>2), secondary causes, and ICH score>3. Demographic, clinical and radiological variables were collected. Patients were compared according to whether they restarted statins at discharge or not.
We performed multivariable logistic regression and Cox regression analyses, adjusting for variables described in previous bivariate models ($p \leqslant 0.05$) and in the literature (age and major predictors of poor outcome). The primary outcome was recurrent ICH. Secondary outcomes included major adverse cardiovascular events (MACE), mortality and good functional prognosis (mRS 0-3), both assessed one year after discharge.
Results: Of 566 patients, 64 met the inclusion criteria [mean age 76 years (SD:10.3); 56.3% female; median follow-up time 52 months (IQR:33-70)]. Of these, 39% received statins at discharge. Statins were not associated with recurrent ICH (aHR: 2.27, 95%CI: 0.81-6.33), MACE (aHR: 2.43, 95%CI: 0.95-6.20), good functional prognosis (aOR: 0.38, 95%CI: 0.11-1.30), or mortality (aOR: 5.13, 95%CI: 0.57-46.29).
Conclusions: In our cohort, no differences in ICH recurrence, MACE, functional prognosis or mortality were observed between patients with spontaneous lobar haemorrhage according to statin use.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

1765

LOW LDL-C LEVELS AND THE RISK OF RECURRENT INTRACEREBRAL HAEMORRHAGE

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Background and aims: Recent studies have demonstrated that aggressive low-density lipoprotein cholesterol (LDL-C) lowering did not significantly increase the risk of intracerebral haemorrhage (ICH). However, these results were mainly based on patients without prior ICH. As ICH survivors are prone to recurrence, the safety of aggressive LDL-C lowering post-ICH remains uncertain. We therefore aimed to study the association between LDL-C levels and risk of ICH recurrence.
Methods: We analysed follow-up data of consecutive ICH survivors from the University of Hong Kong's prospective stroke registry that were admitted during January 2011 to March 2019. The mean follow-up LDL-C values was categorized as <1.8 and $\geqslant 1.8$mmol/L. The association between LDL-C levels and recurrent ICH was determined and adjusted for confounders including ICH location and blood pressure control using multivariate Cox regression.
Results: In 479 ICH survivors (mean age 65±14 years, mean follow-up LDL-C 2.7±0.7mmol/L, 11% with LDL-C<1.8mmol/L), 32 had ICH recurrence during a median follow-up of 34months (IQR 24-55). Among the 104/479 lobar ICH survivors, recurrent ICH risk was higher in those with mean follow-up LDL-C<1.8mmol/L (adjusted hazard ratio [AHR] 4.31, 95% confidence interval [CI] 1.14-16.28). In contrast, patients with non-lobar ICH and mean follow-up LDL-C<1.8mmol/L were not at an increased risk of recurrence (AHR 2.09, 95%CI 0.37-11.79). Statin-use was associated with a reduced ICH risk for non-lobar ICH (AHR 0.10, 95%CI 0.02-0.49), but not for lobar ICH (AHR 0.42, 95% CI 0.13-1.41).
Conclusions: In lobar ICH survivors, LDL-C<1.8mmol/L during follow-up was independently associated with an increased risk of ICH recurrence.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

2025

DIETARY, CONVENTIONAL AND GENETIC RISK FACTORS OF PRIMARY INTRACEREBRAL HEMORRHAGE FROM NORTH-EAST INDIA: A CASE CONTROL STUDY

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Background and aims: A disproportionately high prevalence of Intracerebral Hemorrhage (ICH) is reported from the Northeastern part of India. Apart from conventional risk factors, interplay of diet, extremes of body mass index and genetic polymorphisms may be contributory.
This case-control study was conducted in Tezpur (Figure 1), a remote district in Northeastern India to evaluate: The dietary and conventional risk factors for ICH
The differential distribution of ApoE alleles in ICH
Methods: Consecutive consenting adult patients with first spontaneous ICH presenting to Baptist Christian Hospital, Tezpur along with age and gender matched controls from the community without ICH were enrolled between December 2016 and November 2019. Demographic and clinical data for both cohorts were assessed. (Figure 2)
Results: 220 patients with ICH and 220 age-matched healthy controls were enrolled. Mean ICH score was 1.28. Apart from higher frequency of hypertension (203 (92.3) vs 8 (3.6%), p<0.001), diabetes (12 (5.4) vs 2 (0.9), p<0.001), there was increased consumption of alcohol (69 (31.4%) vs 30 (13.6), p<0.001), smoking (32 (16.8) vs 11 (5.0%), p <0.001) and tobacco (102 (46.4) vs 56 (25.5%), p <0.001) in ICH cases compared to controls. Dietary consumption differed significantly with lower calorie (953(719-1320) vs 1053(792-1359) p=0.042), higher sodium (414

Figure 1: Location of Tezpur, Assam in India's Map

(170-821) vs 219 (89-808), p=0.012) and higher salted tea (80 (36.4) vs 47 (21.4), p=0.001) intake in ICH cases. ApoE polymorphisms did not differ between the two groups.
Conclusions: In this study, apart from conventional risk factors, dietary peculiarities may be contributory to high ICH in this region.

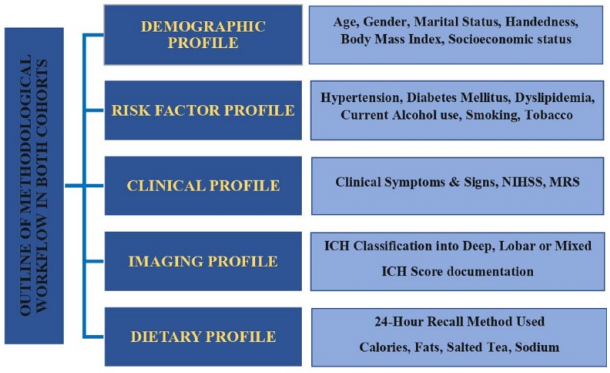

Figure 2: Outline of Methodological workflow in both ICH cases and Controls

Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

2049

Predictors and effects of early and delayed intraventricular haemorrhage: data from the RIGHT-2 Trial and TICH-2 trial

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Background and aims: Early delayed and intraventricular haemorrhage (IVH) complicate acute intracerebral haemorrhage (ICH) and with developing treatments, there is a need to determine predictors and prognostic effects. We assessed these associations using data from the Rapid Intervention with Glyceryl Trinitrate in Hypertensive stroke Trial (RIGHT-2) and Tranexamic acid for hyperacute intracerebral haemorrhage (TICH-2) trial.
Methods: 1233 participants from the sham/control arms of RIGHT-2 and TICH-2 were included. Expert neuroradiologists adjudicated CT's for ICH features blinded to clinical data. Early IVH was defined as being present on baseline CT whilst delayed IVH was defined as new IVH on 24 hour CT. Logistic regression was performed to assess the effects of early and delayed IVH on early neurological deterioration, death at day 7 and day 90 and modified Rankin scale (mRS) at day 90.
Results: 485 participants had IVH: 31.2% with early IVH and 8.1% with delayed IVH. Predictors of early IVH included age (adjusted odds ratio aOR 1.02; 95%CI 1.01-1.03), ICH volume (aOR 1.02; 95%CI 1.01-1.03), systolic blood pressure (aOR 1.007; 95%CI 1.002-1.014) and deep supratentorial location (aOR 2.41; 95%CI 1.72-3.39). Only baseline ICH volume (aOR 1.02; 95%CI 1.01-1.03) and haematoma expansion (aOR 4.78; 95%CI 2.99-7.63) predicted delayed IVH. Both early and delayed IVH were associated with early neurological deterioration, death by day 7 and day 90, and poor outcome (mRS >3 at day 90 (all p<0.005).
Conclusions: Early and delayed IVH are associated with poor outcomes. Screening for delayed IVH may be useful and inform future clinical trials.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

2421

CONTRIBUTION OF DIRECT ORAL ANTICOAGULANTS TO THE INCIDENCE AND PROGNOSIS OF INTRACEREBRAL HEMORRHAGE: POPULATION-BASED DATA

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Background and aims: Direct oral anticoagulants (DOACs) are increasingly used as alternatives to vitamin K antagonists (VKAs). We aimed to investigate the role of this new class of drugs in the incidence and prognosis of spontaneous intracerebral hemorrhage (ICH).
Methods: All patients diagnosed with spontaneous ICH residing in the district of L'Aquila, Italy (298343 inhabitants), during 2011-2020 period, were prospectively included. We identified oral anticoagulant (OAC)-related ICHs by the use of DOACs or VKAs (and INR >2). We focused on time trends in incidence and 30-day case-fatality rates (CFRs).
Results: We recorded 742 ICHs of whom 87 (11.7%) were OAC-related, 33 (4.4%) with DOACs and 54 (7.3%) with VKAs respectively. The proportion of OAC-ICH over total ICHs increased from 5.3% in 2011 to 21.0% in 2020 (p for trend=0.045), with a corresponding incidence trend from 1.3 (95% confidence interval [CI] 0.4-3.4) to 4.4 (95% CI 2.3-7.5) cases per 100,000 person-years. The proportion of DOAC-related ICH over OAC-ICH increased from 0% to 84.6% (p for trend<0.001). Thirty-day CFR for OAC-ICH increased from 25.0% (95% CI 0.6-80.6) to 61.5% (95% CI 31.6-86.1); however, the trend was not significant (p=0.661).
Conclusions: We observed an increasing incidence OAC-related ICH that may depend on the wider adoption of DOACs. The increased incidence was paralleled by a non-significant trend of increased short-term case-fatality that deserves further exploration.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

2505

Beneficial effects of melatonin administration on post-stoke delirium in patients with intracerebral hemorrhage

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Background and aims: Post-stroke delirium (PSD) after intracerebral hemorrhage (ICH) is considered to be even more detrimental compared to that after ischemic stroke. Treatment options for post-ICH PSD remain limited. This study aimed at investigating to what extent prophylactic melatonin administration may have beneficial effects on post-ICH PSD.

Methods: We performed a mono-centric, non-randomized, non-blinded, prospective cohort study, including 339 consecutive ICH patients admitted to the Stroke Unit (SU) from December 2015 to December 2020. The cohort consisted of 220 ICH patients who underwent standard care (defined as the control group) and 119 ICH patients who additionally received prophylactic melatonin (2 mg per day at night) within 24 h of ICH onset until the discharge from the SU. The primary endpoint was post-ICH PSD prevalence. The secondary endpoints were: (i) PSD duration and (ii) the duration of SU stay.
Results: Administration of melatonin was associated with shorter SU stay duration, and shorter PSD duration in post-ICH PSD patients with minor stroke (defined as National Institutes of Health Stroke Scale ⩽4)
Conclusions: This study provides preliminary evidence that melatonin improves course and prognosis of post-ICH PSD, especially in patients with minor hemorrhagic stroke.

	treated n=119	**Control** n=220	**P-value**
Age	76.00 (18.00)	74.00 (21.00)	0.059
Female	51 (42.9)	102 (46.4)	0.536*
NIHSS oa median (IQR)	5.00 (8.0)	9.00 (11.00)	**<0.001^**
ICH-score median (IQR)	1.00 (2.00)	2.00 (1.00)	**0.003^**
mRS oa median (IQR)	0.00 (1.00)	1.00 (2.00)	0.128^
ICH Volume [cm³]	8.00 (12.00)	13 (27.00)	**0.004^**
PSD	57 (47.9)	70 (31.8)	**0.004***

Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

2528

LONG-TERM CASE-FATALITY AND RECURRENCE RATE OF VASCULAR EVENTS IN PATIENTS WITH SPONTANEOUS CEREBELLAR INTRACEREBRAL HAEMORRHAGE: DATA FROM AN INTERNATIONAL COLLABORATION

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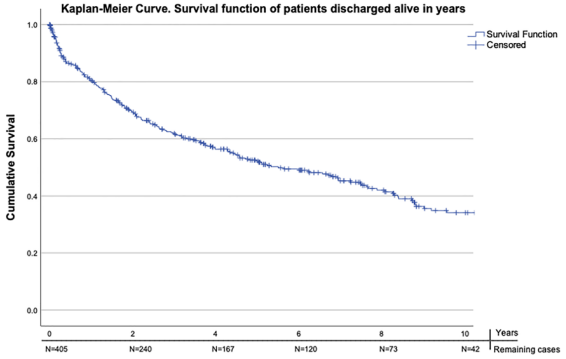
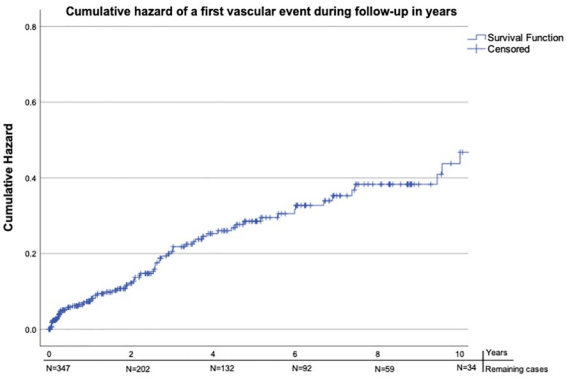
Background and aims: Cerebellar intracerebral haemorrhage (ICH) has a poor short-term prognosis, but data on long-term case-fatality and risk of recurrent vascular events are sparse. We aimed to assess the long-term case-fatality and recurrence rates of vascular events after a first spontaneous cerebellar ICH.
Methods: In this international cohort study, we included patients aged ⩾18 years from 10 hospitals with a first spontaneous cerebellar ICH who were alive upon discharge. Data on long-term case-fatality and recurrence of vascular events were collected for survival analysis.
Results: We included 409 patients (mean age [SD]; 72 [13] years, 49% female). The median survival was 67 months (total range: 0.1-260 months), with a cumulative survival of 34% at ten-year follow-up (figure 1). A total of 92 vascular events occurred in 78 patients: thirty-one (8.9%) patients had a recurrent ICH (supra- or infratentorial), 39 (11%) an ischaemic stroke, 13 (3.7%) a myocardial infarction, and 5 (1.8%) underwent major vascular surgery. The median time to a first vascular event during follow-up was 27 months (ranged 0.4-176 months), with a cumulative hazard of 0.47 at ten-years (figure 2).
Conclusions: The long-term prognosis of patients who survive a first spontaneous cerebellar ICH is poor, with comparable survival rates and risks of recurrent vascular events to patients who survive a first supratentorial ICH. Further identification of patients at high risk of a vascular event following the initial cerebellar ICH is needed, and inclusion of patients with cerebellar ICH in randomized trials on secondary prevention following ICH is warranted.





Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

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MACE, RECURRENT ICH, ISCHAEMIC STROKE AND MYOCARDIAL INFARCTION AFTER INTRACEREBRAL HAEMORRHAGE BY HAEMATOMA LOCATION

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Background and aims: Survivors of spontaneous intracerebral haemorrhage (ICH) have an increased risk of major adverse cardiovascular events (MACE; a composite of ICH, ischemic stroke (IS), spontaneous intracranial extraaxial haemorrhage, myocardial infarction (MI), systemic embolism, or vascular death). There are limited data from large, unselected populations assessing the post ICH risk of MACE, recurrent ICH, IS, and MI by ICH location (lobar vs non-lobar).

Methods: Using multiple sources, we identified a cohort of patients age ⩾50-years with a first-ever spontaneous ICH in Southern Denmark from 2009-2018 (n=2,289), which we categorised as lobar or non-lobar based on hematoma location. The occurrence of outcome events (MACE and separately recurrent ICH, IS, and MI) were recorded from ICH onset to the end of the study period (December 31, 2018) using registries. We verified stroke events based on medical record review. We calculated crude absolute event rates per 100 person-years. We adjusted hazard ratios (aHR) [95% confidence intervals] for potential confounders using inverse probability weighting.

Results: Compared to patients with non-lobar ICH (n=1,255), those with lobar ICH (n=1,034) had higher rates of MACE (10.84 [9.51-12.37] per 100-patient years vs 7.91 [6.93-9.03]; aHR 1.26 [1.10-1.44]) and recurrent ICH (3.74 [3.01-4.66] vs 1.24 [0.89-1.73]; aHR 2.63 [1.97-3.49]) but not IS (1.45 [1.02-2.06] vs 1.77 [1.34-2.34]; aHR 0.81 [0.60-1.10]), or MI (0.42 [0.22-0.81] vs 0.64 [0.40-1.01]; aHR 0.64 [0.38-1.09]).

Conclusions: Spontaneous lobar ICH is associated with a higher subsequent rate of MACE than non-lobar ICH, primarily driven by a higher rate of recurrent ICH.

Disclosure of interest: Yes

INTRACEREBRAL HAEMORRHAGE

2380

Prevalence of adjacently located, recurrent intracerebral haemorrhage and time to recurrence in patients with intracerebral haemorrhage related to small vessel disease

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Background and aims: We hypothesize that early recurrences of non-traumatic intracerebral haemorrhage (ICH) and non-aneurysmatic convexity subarachnoid haemorrhage (cSAH) may involve local vessel fragility or inflammation. We aimed to investigate time to recurrent ICH and haematoma location for the index and recurrent haemorrhage.

Methods: We identified patients with ⩾2 ICH from a prospective ICH Registry (2013-2021). The main outcome was recurrent haemorrhage adjacent to the first ICH according to the cerebral haemorrhage anatomical rating scale. We further assessed time between two recurrent ICH.

Results: Among 1253 patients with ICH, we identified 97 events in 36 patients (2.9%; median age 72 years, interquartile range (IQR) 64-77, 59% female, median NIHSS 4, IQR 3-6). First ICH location was lobar in 25 (69%), deep in 7 (19%), cerebellar or undetermined in 1 each (3%) and cSAH in 2 (6%) patients. Median number of ICH was 2 (IQR 2-3). In 22 patients (61%), first ICH was left-sided. Of the 61 recurrent ICH, 47 ICH (77%) recurred adjacent to the first ICH (100% lobar). Fourteen ICH (23%) occurred remotely (36% deep, 36% cSAH, 21% lobar, 7% uncertain). Time to recurrence was shorter for patients with adjacent versus remote ICH (median 277.5 days, IQR 103-848 vs. 873.5 days, IQR 184-2399, p=0.09) and decreased with higher number of previous events (figure).

Conclusions: Recurrent ICH often occurs early and adjacent to the first ICH and is mostly lobar. Our findings suggest differences in disease activity between brain regions and small vessel disease subtypes that merit further investigation.

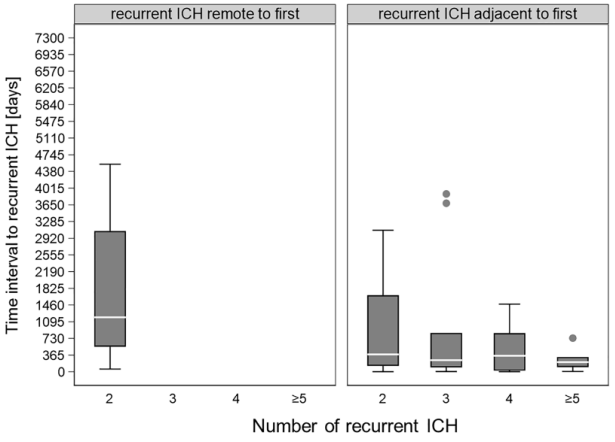

Figure: In ICH occurring adjacent to the first one, latency between two ICH decreases with higher number of previous events.

Disclosure of interest: Yes

INTRACEREBRAL HAEMORRHAGE

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STATIN USE AND LOCATION-SPECIFIC RISK OF INTRACEREBRAL HAEMORRHAGE: A NESTED CASE-CONTROL STUDY

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Background and aims: Data supporting associations between statin use and intracerebral haemorrhage (ICH) location are limited. Because ICH location may have differing pathologies (arteriolosclerosis in non-lobar ICH; cerebral amyloid angiopathy in lobar ICH), we hypothesized that a relationship between statin use and ICH differs based on ICH location.

Methods: We verified all first-ever spontaneous ICH cases (age⩾55-years) admitted to hospitals in Southern Denmark (2009-2018) which we classified as lobar or non-lobar and matched to population controls. We used Danish nationwide registries to ascertain medication use, comorbidities, and medical history. Using conditional logistic regression, we calculated adjusted odds ratios (aORs) and corresponding 95% Confidence Intervals (CIs) for the risk of lobar and non-lobar ICH.

Results: We identified 989 lobar (52.2% women, mean age 76.3-years) and 1,175 non-lobar cases (46.5% women, mean age 75.1-years) matched with 39,500 and 46,755 controls, respectively. Current statin use was associated with a lower risk of lobar (aOR 0.83, CI 0.70-0.98) and non-lobar ICH (aOR 0.84, CI 0.72-0.98). Longer duration of statin use also was associated with lower risk of lobar and non-lobar ICH (<1 year: aOR 0.89, CI 0.69-1.14 vs. 1.00, CI 0.80-1.25; ⩾1-<5years: aOR 0.89, CI 0.73-1.09 vs. 0.88, CI 0.73-1.06; ⩾5 years: aOR 0.67, CI 0.51-0.87 vs. 0.62, CI 0.48-0.80). Associations with statin intensity were similar to overall estimates for low-medium intensity therapy whereas the association with high-intensity therapy was neutral.

Conclusions: Statin use was associated with lower risk of ICH, particularly with longer treatment duration regardless of hematoma location.

Disclosure of interest: Yes

INTRACEREBRAL HAEMORRHAGE

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Secondary Stroke Prevention after Nontraumatic Intracerebral Hemorrhage in the US National Get With The Guidelines-Stroke Quality Improvement Registry

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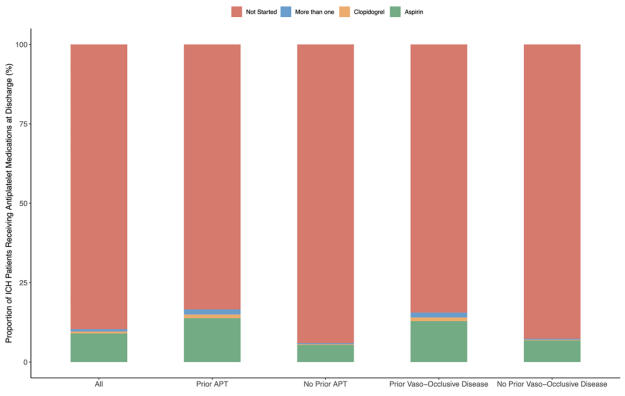
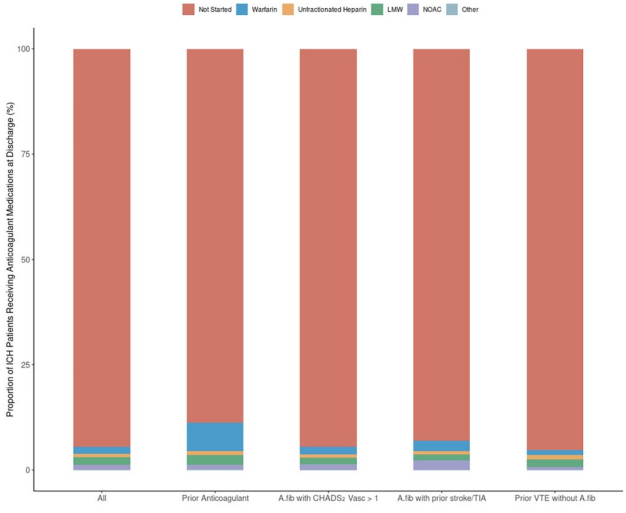
Background and aims: Survivors of intracerebral hemorrhage (ICH) face an increased risk of ischemic cardiovascular events, but current ICH guidelines do not provide definitive recommendations regarding the use of antithrombotic and statin therapies. Therefore, our objective was to study practice patterns and factors associated with the use of such medications after ICH.

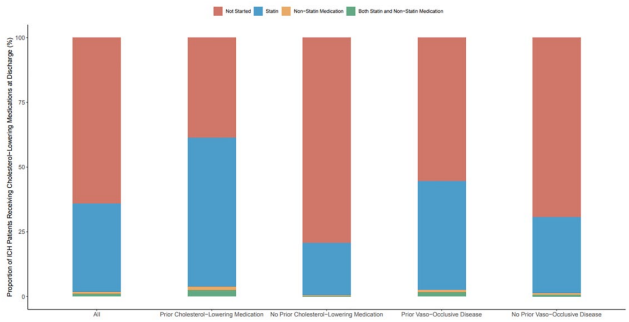
Methods: We performed a cross-sectional study of patients with ICH in the Get With The Guidelines–Stroke registry, between 2009 and 2021. Patients who transferred to another hospital, died during hospitalization, and those with missing information on discharge medications were excluded. We calculated the proportion of ICH patients started on antithrombotic and lipid lowering medications at discharge. We then examined post-discharge use of these medications within subgroups defined by pre-ICH use as well as a history of ischemic events, and studied factors associated with the initiation of these medications after ICH.

Results: Among 490,000 patients with ICH, 50,416 (10.4%) were prescribed antiplatelet medications, 27,085 (5.6%) anticoagulation therapy, and 177,205 (35.9%) lipid lowering medications at discharge. Antithrombotic medications were rarely started in those who were not taking them before their ICH, and even among those who were using these medications before their ICH, most did not have them restarted before discharge from their ICH hospitalization (Figures 1-3).

Conclusions: Few patients with ICH are newly started on antithrombotic or lipid-lowering therapies. Given the emerging association between ICH and future ischemic stroke or myocardial infarction, trials examining the net benefit of antithrombotic and lipid lowering therapy after ICH may be warranted.







Disclosure of interest: Yes

INTRACEREBRAL HAEMORRHAGE

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LOBAR INTRACEREBRAL HEMORRHAGE: CLINICAL AND RADIOLOGIC CHARACTERISTICS

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Background and aims: Intracerebral haemorrhage (ICH) has a high mortality and a non-decreasing incidence. There is a need to describe how clinical characteristics and pathogenesis vary between lobar and other types of ICH. Therefore, our aim was to describe radiological and clinical characteristics of lobar ICH patients in comparison with other ICH subtypes.

Methods: Spontaneous ICH patients and their clinical characteristics were identified from four cohorts in Lund, Gothenburg, and two in Malmö. The patients' CT scans were reviewed by a neuroradiologist, who determined ICH subtypes and other radiological characteristics. A neuroradiological fellow independently reviewed 10% of the cases to assess interrater variability. The blood volume was calculated using the computer program qER-NCCT (Qure.ai, Mumbai, India), which has excellent agreement to manual segmentation.

Results: We included 401 ICH patients. Distribution of ICH subtypes was lobar 48%, deep 44%, cerebellar 7%, and brainstem 2%. The interrater reliability for ICH localisation was very good (κ=0.96 (95%CI 1.03–0.89), $p<0.001$). Clinical and radiological characteristics are presented in the Table. Lobar ICH patients had a median age of 76 years (IQR 71–83) and 62% were male. Lobar ICH were larger (median 15 mL, IQR 4–32) compared to deep, cerebellar, and brainstem ICH and was the only subtype with multiple haemorrhages (5%).

Conclusions: Clinical and radiological characteristics differ between ICH subtypes. Pathogenetic mechanisms need to be evaluated in detail for individual ICH subtypes and should be considered in clinical practice and in future studies.

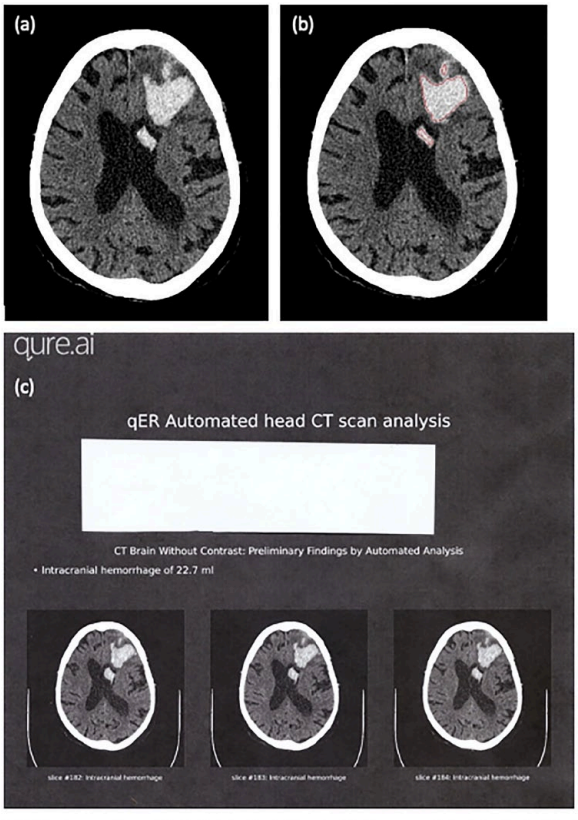
	Lobar (n = 192)	Deep (n = 176)	Cerebellar (n = 27)	Brainstem (n = 6)
Age at stroke, years (IQR)	76 (71–83)	75 (67–82)	75 (70–82)	73 (58–76)
Gender, % male	62	67	56	67
Diabetes mellitus	36 (19)[a]	32 (18)	4 (15)	1 (17)
Heart disease, *n* (%)	14 (11)[g]	13 (13)[h]	1 (6)[e]	0 (0)[c]
Ischemic heart disease, n *(%)*	8 (7)[g]	9 (9)[h]	1 (6)[e]	0 (0)[c]
Hypertension, *n* (%)	108 (57)[a]	106 (61)[a]	16 (59)	4 (67)
Hypercholesterolemia, *n* (%)	116 (61)[a]	96 (55)	19 (70)	3 (50)
Smoking, *n* (%)	73 (40)[d]	69 (41)[d]	9 (35)[a]	3 (50)
Previous stroke, *n* (%)	16 (8)	14 (8)	2 (7)	0 (0)
Antithrombotic medication, *n* (%)	75 (39)	58 (33)	9 (33)	0 (0)
Platelet inhibitors[k]	46 (24)	31 (18)	4 (15)	0 (0)
Warfarin	16 (8)	12 (7)[a]	4 (15)	0 (0)
NOAC[l]	14 (15)[j]	15 (15)[j]	1 (8)[f]	0 (0)[b]
Haemorrhage characteristics, *n* (%)				
Volume, mL (IQR)	15 (4–32)	7 (2–16) *	5 (2–13) †	1 (1–4) †
Multiple haemorrhages	10 (5)	0 (0) †	0 (0)	0 (0)
Ventricular extension	38 (20)	72 (41) *	7 (26)	2 (33)
Subarachnoid fingerlike projections	54 (28)	NA	NA	NA

* p <0.001 † p <0.01

Missing data for number of patient(s): [a] One; [b] Two; [c] Four; [d] Seven; [e] 11; [f] 14: [g] 68; [h] 72; [i] 77; [j] 99. [k] Including Aspirin, Clopidogrel, Dipyridamole, and/or other platelet inhibitors for Lund and Gothenburg cohorts. Only including Aspirin for Malmö cohorts. [l] Including Apixaban, Dabigatran, Rivaroxaban, and/or Edoxaban.

ICH indicates Intracerebral Haemorrhage; IQR, Interquartile Range; NA, Not Applicable; NOAC, Non-Vitamin K Antagonist Oral Anticoagulant.

Continuous data are presented as median and categorical variables as count (percentage). p value indicates statistically significant difference between characteristics of patients with lobar ICH compared to patients with deep, cerebellar, and brainstem ICH respectively.



(a) CT brain scan of one of the included patients. Examined by the neuroradiologist as having lobar ICH, ventricular extension, and subarachnoid fingerlike projections. (b) Markings (in red) by the qER-NCCT program for blood volume calculation. (c) Corresponding blood volume calculation, as reported by the qER-NCCT program.

CT indicated Computed Tomography; ICH, Intracerebral Haemorrhage; qER-NCCT,

Disclosure of interest: Yes

INTRACEREBRAL HAEMORRHAGE

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PREDICTION OF INTRACEREBRAL HEMORRHAGE GROWTH BY CT-PERFUSION: A PROSPECTIVE STUDY

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Background and aims: The aim of this study is to evaluate whether perihematomal hypoperfusion assessed by computed tomography perfusion(CTP) is related to hematoma growth(HG) in patients with intracerebral hemorrhage(ICH).
Methods: Patients with primary ICH<12hours were included.Cranial tomography(NCCT),CTP and CT-angiography(CTA)were performed at admission, and control NCCT was done at 24-72 hours. Hematoma and perihematomal edema volumes were quantified by using a deep-learning approach. The difference in volume(>33% and/or 6ml) between baseline and control-NCCT determined the HG. CBV, CBF, MTT, TTP and Tmax were calculated on the CTP. Neurological deficit was evaluated through the NIHSS on admission, 24-72 hours, and 90 days.
Results: 150 patients were included (median age 73 years,38% women). HG was detected in 22.67% of patients.Female sex, and NIHSS were the only clinical variables associated with HG in the univariate analysis.HG was associated with higher mortality during hospitalization and at 90 days. Among radiological variables, baseline ICH volume, presence of spot sign, number of spots>1, size of spots, lobar location, Tmax and TTP values were associated with HG. After adjustment for potential confounders, Tmax was the only CTP variable independently associated with HG. In the ROC analysis Tmax⩾5,89 showed the best sensitive value for prediction of HG(sensitivity,0.81; specificity,0.41).
Conclusions: Delayed Tmax was associated with HG, suggesting a potential role of the perihematomal area in the mechanisms that lead to HG and Tmax⩾5,89 was the best predictive value of HG. These findings could help the selection of ICH patients who are more likely to benefit from hemostatic treatment to prevent HG.
Disclosure of interest: Yes

INTRACEREBRAL HAEMORRHAGE

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COMORBIDITY IN ORAL ANTICOAGULANT-RELATED INTRACEREBRAL HEMORRHAGE

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Background and aims: We aimed to explore if background morbidity was comparable in participants from large direct oral anticoagulant (DOAC) trials and patients admitted with oral anticoagulant-related intracerebral hemorrhage (OAC-ICH).
Methods: The COOL-ICH cohort included all patients with acute OAC-ICH in the Capital Region of Denmark, from January 2010 until May 2018. Multimorbidity was compared between patients on DOACs and vitamin K-antagonists (VKA), and between OAC-ICH patients and populations from DOAC phase III trials.
Results: We identified 401 patients (272 VKA-ICH, 129 DOAC-ICH). Patients on DOAC presented higher pre-stroke modified Rankin Scale (median: 1 vs. 0, $p = 0.002$) and were more frequently female (53 % vs. 39 %, $p = 0.009$) compared to patients on VKA. Risk-factors and comorbidity scores were comparable in DOAC- and VKA-patients. Compared to the trial cohorts, the OAC-ICH cohort was older (8 – 23 years older) and included more women. $CHADS_2$ in the COOL-ICH cohort (2.4) was lower than in ROCKET-AF (3.5) and ENGAGE-AF TIMI-48 (2.8), but higher than in ARITSTOTLE (2.1) and RE-LY (2.1).
Conclusions: Female sex and pre-stroke disability were more frequent in patients with ICH on DOAC than in patients with ICH on VKA. Participants in DOAC-trials were younger and more frequently men than patients with OAC-ICH, however, the comorbidity burden was comparable. Representation of females and elderly in future trials is crucial as these groups are overrepresented in the group with severe adverse effects.
Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

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Do-not-attempt resuscitation decision associated with increased death and dependency in intracerebral haemorrhage: data from the TICH-2 trial

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Background and aims: Do-not-attempt-resuscitation (DNAR) decision is commonly made after intracerebral haemorrhage. We explored the association of a DNAR decision on care process and clinical outcomes amongst patients with intracerebral haemorrhage.
Methods: 2325 patients from the Tranexamic acid for IntraCerebral Haemorrhage-2 trial were included. We compared the clinical characteristics and care process (intensive care, ventilation, neurosurgery) in patients who had DNAR decision with those without. We performed logistic regression analyses with adjustment for key prognostic factors to explore the effect of early DNAR (by day 2) on outcomes of day-7 death and day-90 modified Rankin Scale (mRS).
Results: DNAR decisions were made in 392(16.9%) in the first 2 days. Patients with DNAR order were older (mean age 79.1 vs 66.9 years), more likely female (22.8% vs 12.4%), in United Kingdom (18.9% vs 7.5% in non-UK), lower GCS (12[10, 14] vs 15[13, 15]), larger ICH volume (48.5mL vs 18.9 mL) and more intraventricular haemorrhage (28.1% vs 12.2%). Patients with DNR order were less likely to be receive intensive care (5.6% vs 10.6%) and neurosurgery (1.5% vs 5.9%) but not invasive ventilation(5.2% vs 7.4%). 178(45.4%) patients with DNAR died within 7 days compared to 43(2.2%) without DNAR order. Early DNAR increased death within 7 days (aOR 21.3;95% CI 13.6-33.5) and mRS of ⩾4 at day 90 (aOR 2.8;1.8-4.4).
Conclusions: Early DNAR decisions were associated with limitation of care and increased risk of early death and poor functional outcome despite adjustment for prognostic factors. Early DNAR decisions should therefore be avoided.
Disclosure of interest: No

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External Validation and Update of The Arise Prediction Models for Aneurysmal Rerupture after Aneurysmal Subarachnoid Hemorrhage

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Background and aims: Clinical decision-making on timing of aneurysm repair in patients with aneurysmal subarachnoid hemorrhage (aSAH) could be improved by estimating the individualized risk of rerupture. We performed an external validation of the base and extended ARISE prediction models for predicting pre-interventional aneurysmal rerupture within 24 and 72 hours in aSAH patients.

Methods: We used data from the Oslo University Hospital (n=833) and the Erasmus MC University Medical Center Rotterdam (n=634) to validate the base model (including age, sex, hypertension, World Federation of Neurological surgeons grade, Fisher grade, aneurysm size, and cerebrospinal fluid diversion) and the extended model (extended with aneurysm irregularity). We assessed the c-statistics, calibration-in-the-large, and the calibration plots with the calibration slopes. After validation, we updated the models.

Results: In total, 143 patients (10%) suffered pre-interventional rerupture. The externally validated c-statistics were 0.75 (95%CI: 0.71-0.80) for the base model and 0.71 (95%CI: 0.66-0.76) for the extended model when validated in the Oslo cohort, and 0.70 (95%CI: 0.64-0.76) for the base model and 0.64 (95%CI: 0.57-0.72) for the extended model when validated in the Rotterdam cohort. After updating the baseline hazards, the base model calibrated excellently over the range of clinically relevant probabilities of rerupture, but the extended model calibrated poorly and overestimated the risk of rerupture.

Conclusions: We confirmed the discriminative ability of the ARISE base model at external validation. When implementing the prediction model in clinical practice, the models require recalibration for the specific setting in which the model is to be applied.

Figure 1: Calibration plots after updating the baseline hazards (Oslo)

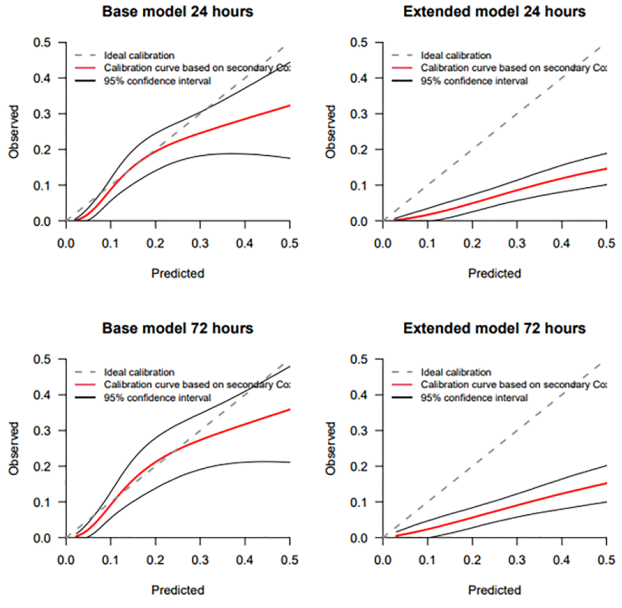
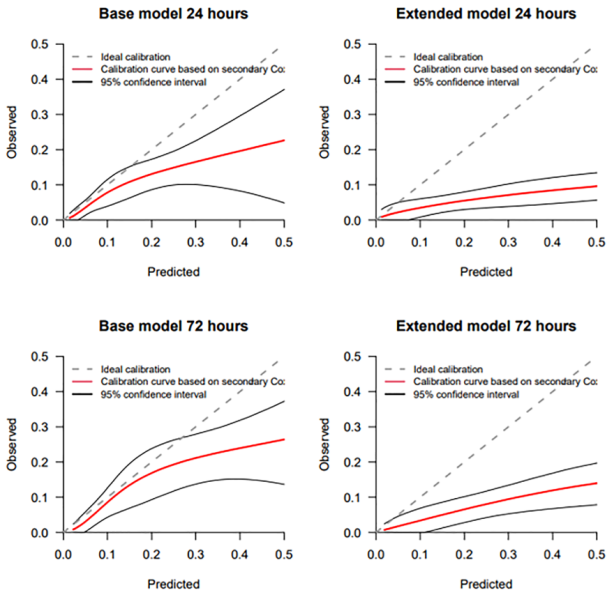


Figure 2: Calibration plots after updating the baseline hazards (Rotterdam)



Disclosure of interest: No

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How should an external ventricular drain (EVD) be challenged? A single centre experience AND meta-analysis

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Background and aims: EVDs are removed after being challenged, either by using a "clamp and removal "(rapid) method or a "raise, clamp and remove "(gradual) approach. The aim of this study is to assess which approach is best.

Methods: Data from a prospectively maintained database of subarachnoid haemorrhage patients were analysed. Additional data, such as the method of challenge was abstracted from the clinical notes. A propensity score (ps) matching study was performed to compare the effectiveness of the rapid vs gradual weaning approach in those who survived up to the time of EVD challenge. A meta-analysis of studies that compared the rapid vs gradual EVD approach was also performed.

Results: No significant difference in infection rate, duration of EVD insertion (median 10 days), need for EVD reinsertion (0% vs 3.2% p<0.5), VP shunt insertion (11% vs 10% p=0.77) was observed between ps matched groups. EVDs were removed significantly quicker after decision to challenge in the rapid group (1 day (IQR 1-4) vs 4 days (IQR 2-8) p<0.001). A reduced length of stay (LOS) was observed in the rapid group but this was not significant (26 vs 33 days, p=0.15).
Conclusions: These data suggest that the rapid wean approach is safe and may be associated with reduced LOS
Disclosure of interest: No

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Clinical prediction models for aneurysmal subarachnoid haemorrhage: a systematic review update

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Background and aims: A systematic review of clinical prediction models for (aneurysmal subarachnoid haemorrhage) aSAH reported in 2011 noted that clinical prediction models for aSAH were developed using poor methods and not externally validated. The aim of this study was to update the above review to provide guidance in future development of predictive models in aSAH.
Methods: We systematically searched the EMBASE and MEDLINE databases (Jan12- Feb22) for articles that reported the development of clinical prediction models to predict functional outcome in aSAH. We followed the PRISMA statement, and data from each study was abstracted using the CHARMS 2014 check list. Bias and applicability were assessed using the PROBAST tool.
Results: We reviewed data on 30205 patients contributing to 45 prediction models abstracted from 26 studies identified from an initial search of 7858 studies. Most models were developed using logistic regression(n=36) or machine learning(n=9) with prognostic variables selected through univariate and multivariate analysis. Age (n=30), World Federation of Neurological Surgeons grade(n=25), hypertension(n=11), aneurysm size(n=10), Fisher grade(n=14), Hunt and Hess score(n=10), Glasgow Coma Scale(n=9) were the variables most frequently included in the reported models; 2 studies used WBC count, platelet-lymphocyte ratio and D-Dimer. Only 5 studies (12 models) performed any external validation. All models except one was assessed as having a high risk of bias as they lacked sufficient performance measures or validation.
Conclusions: Although more externally validated risk prediction models now exist, most contemporary risk prediction models still suffer high risk of bias and are not fit for clinical use
Disclosure of interest: No

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Younger biological age is associated with arterial vasospasm in aneurysmal Subarachnoid Hemorrhage

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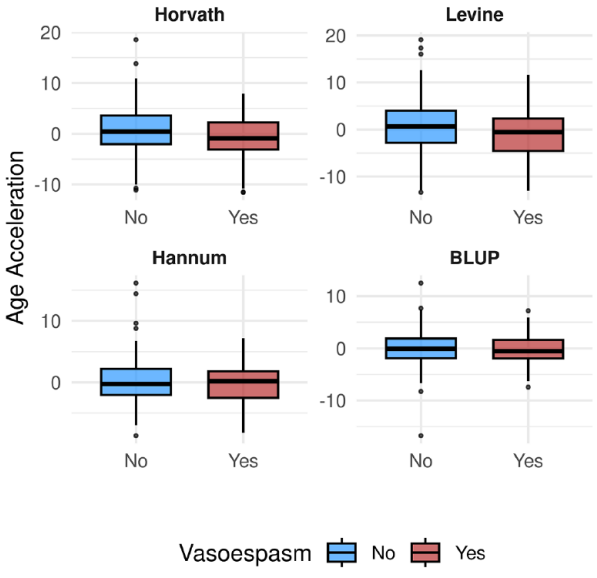
Background and aims: Vasospasm is a complication that affects up to 70% of patients with aneurysmal subarachnoid hemorrhage (aSAH). Although controversial, several studies have found a younger age associated with vasospasm risk. However, we know that biological age (B-age) is a better predictor of risk for age-related diseases than chronological age (C-age), but no study assessed whether B-age, represents a risk factor for vasospasm as well. Here we aimed to study the relationship between epigenetic B-age and vasospasm.
Methods: We included 282 patients with aSAH recruited from 2007 to 2018. Whole blood DNA was extracted within 24 hours after admission. DNA methylation (DNAm) was measured with the EPIC chip (Illumina), which interrogates more than 850,000 CpG positions. DNAm data was processed with standard bioinformatic pipelines and B-Age was estimated with several formulas: Horvath's, Hannum's, Levine's and BLUP clocks. Age acceleration (AgeAccel) was calculated regressing out C-age from each B-age estimation.
Results: A total of 143 (51.8%) participants suffered vasospasm. Mean age of the sample was 55.7 (±13.6) and all B-age estimations showed a good fit (correlation between C-age and B-age >0.7 and average AgeAccel was close to 0 in all cases). As showed in figure 1, we found that patients with vasospasm had a decreased AgeAccel according to Horvath's ($\bar{x}_{Vasoespasm}$=-0.68[±3.9] vs $\bar{x}_{NoVasoespasm}$=0.50[±4.7], *p*-value=0.023) and Levine's clocks ($\bar{x}_{Vasoespasm}$=-0.89[±4.9] vs $\bar{x}_{NoVasoespasm}$=0.74[±5.7], *p*-value=0.012) as compared to patients without.
Conclusions: aSAH patients with vasospasm are biologically younger irrespectively of their C-age. Epigenetic changes might influence translation of proteins related to vasospasm development.



Disclosure of interest: No

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HIGH SERUM LEVEL OF INTERLEUKIN 8 DURING THE EARLY BRAIN INJURY PERIOD IS ASSOCIATED WITH POOR OUTCOME AFTER SPONTANEOUS SUBARACHNOID HEMORRHAGE

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Background and aims: Neuroinflammation and blood-brain barrier (BBB) disruption are mechanisms implicated in the severity of early brain injury (EBI) after spontaneous Suarachnoid Hemorrage (SAH). We studied the association between serum levels of inflammatory and pro-angiogenic biomarkers collected during the EBI period with hallmarks of BBB-disruption and with clinical outcome.
Methods: We prospectively included 111 SAH patients admitted within 24h of bleeding (71% women, median age 56, 60% WFNS 1-3, 77% modified-Fisher 4). Serum levels of Ang-2, FGF, HGF, IL-8, PDGF, TNF-alfa and VEGF in samples obtained within 72h of hospital admission were measured through ELISA. Dynamic contrast enhanced MRI was used to extract white matter K-trans values as a measure of BBB-disruption. Clinical outcome was evaluated at 90 days with the modified Rankin scale (mRS, poor outcome mRS$>$2).
Results: Ang-2, HGF and IL-8 levels were significantly correlated with admission WFNS, index aneurysm size and elevated white matter k-trans ($p<0.01$ for all correlations). Poor clinical outcome occurred in 43 (39%) patients and was associated with higher levels of Ang-2 (p=0.023), HGF (p=0.002), IL-8 ($p<0.001$) and VEGF (p=0.010). In stepwise regression analysis adjusted by age, sex, WFNS, modified-Fisher and aneurism size, IL-8 remained as an independent predictor of poor clinical outcome (aOR per IQR of increase 2.04, 95%CI 1.22-3.42, p=0.007).
Conclusions: High serum level of IL-8 was associated with EBI biomarkers, with increased BBB permeability at the end of the EBI period and with poor clinical outcome at 3 months. The potential pathogenic role of IL-8 in SAH deserves further study.
Disclosure of interest: No

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Complications and Intensive Care Unit Length of Stay in Patients with Aneurysmal Subarachnoid Hemorrhage patients: a multiethnic cohort

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Background and aims: Besides poor clinical status at hospital admission, medical and neurological complications are associated with increased mortality and costs in patients with aneurysmal subarachnoid hemorrhage (aSAH).
Methods: To examine the correlation between complications, ICU length of stay and clinical outcomes at discharge, a multiethnic cohort of 212 aSAH patients admitted to a high-volume center was studied. The primary outcome was the functional outcome at hospital discharge (modified Rankin scale - mRs), and the secondary outcome ICU length of stay. Univariate and multivariate logistic regression models were employed.
Results: Among 212 patients, 92% developed at least one complication during hospitalization; 89,2% developed at least one neurological complication (hydrocephalus was the most frequent one – 34,4%, followed by intracranial hypertension - 33%, DCI-related infarction - 18,7%, and seizures - 11,8%). 25/212), and 59.4% developed at least one systemic complication (infection of undetermined source - 20.8%, pneumonia - 18.4%, bloodstream infection - 14.6%, ventriculitis - 13.7% and urinary tract infection - 4.7%, hyponatremia - 19,8%, hypernatremia - 20,8%, and AKI - 16,5%). Patients with medical (OR 2.6, 95%CI 1.9-3.7, $p<0.001$) and neurological complications (OR 4.3, 95%CI 1.4-13.1, p=0.005) had prolonged ICU and hospital LOS, which were both associated with worse clinical outcome at discharge (mRS 3-6).
Conclusions: In conclusion, clinical and neurological complications are important determinants of ICU LOS and clinical outcomes in patients with aSAH. Future prospective and randomized trials should focus on delineating these variables and creating bundles able to treat and safely discharge these patients from the ICU.
Disclosure of interest: No

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SCANXIETY IN PATIENTS WITH UNRUPTURED INTRACRANIAL ANEURYSMS UNDERGOING SURVEILLANCE IMAGING: A PROSPECTIVE COHORT STUDY

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Background and aims: Patients with an unruptured intracranial aneurysm (UIA) are often monitored radiologically. In the time period around the follow-up scan patients may experience anxiety, which has been termed 'scanxiety'. We studied the prevalence of scanxiety in UIA patients and its effect on health-related quality-of-life (HRQoL) and emotional functioning.
Methods: This study was performed in patients who were scheduled for follow-up imaging of one or more UIAs in a tertiary referral centre. Patients were asked to complete questionnaires 4 weeks before the scan, immediately after, and 6 weeks after the scan. Scanxiety was operationalised as self-reported scanxiety, and measured with a purpose-designed questionnaire. HRQoL was assessed with the EuroQol 5-dimensions (EQ-5D) and emotional functioning with the Hospital Anxiety and Depression Scale (HADS). A linear mixed effects model was used to assess the course of QoL outcomes in the time period around imaging and explore predictors.

Results: Of 158 eligible patients, 106 (67%) participated. Sixty of 91 patients (66%) experienced scanxiety, which peaked in 36/59 patients (61%) between the scan and receiving results, and resolved in 32/49 patients (65%) within a day after receiving results. QoL outcomes did not change around the scan. Scanxiety was associated with emotional functioning (adjusted HADS sum score:4.2;95%CI:1.8–6.7), but not with HRQoL (adjusted EQ-5D sum score:-4.5;95%CI:-9.7–0.6).
Conclusions: Two-thirds of the UIA patients who had follow-up imaging experienced scanxiety, which affected emotional functioning, but not HRQoL. To minimise the duration of scanxiety, the time between the scan and receiving the results should be minimised.
Disclosure of interest: No

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PERIVASCULAR MACROPHAGES MEDIATE MICROVASOSPASMS AFTER SUBARACHNOID HEMORRHAGE

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Background and aims: Arterial microvasospasms occur in patients and experimental animals early after subarachnoid hemorrhage (SAH) and reduce cerebral blood flow. Recently, inactivation of perivascular macrophages (PMVs) has been shown to improve neurological outcome after experimental SAH, however, the mechanism remained unknown. We therefore investigated the role of perivascular macrophages (PVM) for the formation of microvasospasms after experimental SAH
Methods: PVM were depleted in C57Bl6 mice seven days before SAH by intracisternal injection of liposomes loaded with Clodronate (n=8) or vehicle (n=8). SAH was induced by filament MCA perforation under continuous monitoring of CBF and ICP. Six hours after SAH, caliber variations of the cerebral microvasculature were analyzed in nine standardized regions of interest by in-vivo 2-photon microscopy through a cranial window. Thereafter, PVMs were quantified by immunohistochemistry using anti-CD206 and anti-laminin antibodies.
Results: PVM were located around 1st and 2nd order penetrating arterioles and depleted by Clodronate ($p<0.01$). After SAH, MVS predominantly occurred in pial arteries and in 1st and 2nd order penetrating arterioles (PA). Macrophage depletion significantly reduced the number of MVS/animal (pial vessels: p=0.02, 5 1st PA: p=0.01, 2nd PA: p=0.04).
Conclusions: Our results suggest that PVM induce microvasospasms after SAH. PVMs may thus represent a novel therapeutic target for SAH patients.
Disclosure of interest: No

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A SHORT SWEDISH VERSION OF THE MONTREAL COGNITIVE ASSESSMENT

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Background and aims: The international guidelines recommend cognitive screening of patients admitted to stroke units, and brief screening tools are preferred. The primary objective of this study was to develop a short-form Montreal Cognitive Assessment (MoCA) Swedish Version (s-MoCA-SWE) for use in patients with stroke. The secondary objectives were to identify an optimal cutoff value for the s-MoCA-SWE to screen for cognitive impairments and to compare the sensitivity of the s-MoCA-SWE with previously developed short forms of the MoCA.
Methods: This cross-sectional study included patients admitted to the stroke and rehabilitation units in hospitals across Sweden. Cognition was screened using the MoCA (range 2 – 14 days after onset of stroke). Supervised and unsupervised algorithms were used to develop working versions of the s-MoCA-SWE. The final version of the s-MoCA-SWE was chosen based on its sensitivity and positive predictive value for detecting patients with cognitive impairments.
Results: Data from 3276 patients were analyzed (40% female, mean age 71.5 years, 56% minor stroke at admission). The s-MoCA-SWE suggested in this study comprised the following items: delayed recall, visuospatial/executive function, serial 7, fluency, and abstraction. The aggregated scores ranged from 0 to 16. A threshold for impaired cognition $\leqslant 12$ had a sensitivity of 97.3 (95% confidence interval [CI]:96.5-97.9) and positive predictive value of 89.9 (95%CI:88.8-90.9).
Conclusions: Our s-MoCA-SWE with a threshold of $\leqslant 12$ can detect post stroke cognitive issues. Therefore, it can be used as a rapid cognitive testing tool in stroke units.
Disclosure of interest: No

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Impact of changes in exercise habit on incident dementia after ischemic stroke

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Background and aims: We aimed to investigate the effects of exercise habit changes on the risk of incident dementia after ischemic stroke using the Korean National Health Insurance Services Database.
Methods: This study included 223,426 patients with a new diagnosis of ischemic stroke between 2010 and 2016 who underwent two serial ambulatory health checkups. The participants were divided into four categories according to their habit change or regular exercise: persistent non-exercisers, new exercisers, exercise dropouts, and exercise maintainers. The primary outcome was new diagnosis of dementia. Multivariate Cox proportional models were used to assess the effects of changes in exercise habits on the risk of incident dementia.
Results: After a median of 4.02 years of follow-up, 22,554 (10.09%) dementia cases were observed. After adjusting for covariates, exercise dropouts, new exercisers, and exercise maintainers were significantly associated with a lower risk of incident dementia than persistent non-exercisers (adjusted hazard ratio [aHR] 0.937; 95% confidence interval [CI] 0.905–0.970, aHR 0.876; 95% CI 0.843–0.909, aHR 0.705; 95% CI 0.677–0.734, respectively). The impact of changes in exercise habit was more prominent in the 40–65 years age group. An energy expenditure $>1{,}000$ metabolic equivalents of task-min/wk post stroke was consistently associated with a lower risk of each outcome.

Conclusions: In this study, initiating or continuing moderate-to-vigorous exercise after ischemic stroke was associated with a lower risk of dementia development. The promotion of exercise in ambulatory stroke patients may reduce their future risk of incident dementia.
Disclosure of interest: No

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Depressive symptoms profiles and dementia risk after spontaneous intracerebral hemorrhage: a hierarchical clustering analysis study

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Background and aims: Depressive symptoms are commonly reported after spontaneous intracerebral hemorrhage (ICH) and frequently associated with cognitive decline. Using hierarchical clustering analysis (HCA), we aimed to identify different post-ICH depressive symptoms profiles and to evaluate their association with dementia risk.
Methods: We included consecutive 6 months ICH survivors from the prospective Prognosis of Intracerebral Hemorrhage (PITCH) study. Depressive symptoms severity (assessed using the Montgomery–Åsberg Depression Rating Scale [MADRS]), along with the presence of apathy and anxiety (screened as Neuropsychiatric Inventory [NPI] items) was used for HCA. Baseline clinical/neuroimaging characteristics and the risk of incident dementia were compared between different clusters using univariate and multivariable models.
Results: Of 265 six-months ICH survivors, 221 (83%) underwent neuropsychiatric screening (mean age 65.5 years; 57% male). Using HCA, 3 clusters were identified: Group-1 ("normal", n=152; median MADRS score=2 [IQR 0-4]); Group-2 ("depressive symptoms + apathy", n=41; median MADRS score=15 [IQR 5-20], 68% with apathy); Group-3 ("depressive symptoms + anxiety", n=28; median MADRS score=17 [IQR 9-25]; 100% with anxiety). Compared to Group-1, patients in Group-2 and Group-3 had higher rates of pre-ICH depression (respectively, odds ratio [OR]=3.2 95% confidence interval [95%CI]=1.1-9.1; OR=5.2, 95%CI=1.92-14.3), patients in Group-2 had higher rates of cerebral atrophy (OR=2.4, 95%CI=1.4-4.2). Compared to Group-1, only Group-2 showed a significantly higher risk of long-term new-onset dementia (adjusted hazard ratio=2.2, 95%CI=1.3-3.8).
Conclusions: Based on concomitant presence of apathy and anxiety, we identified 3 post-ICH depressive symptoms profiles, possibly reflecting distinct neuropsychiatric syndromes with different long-term cognitive risk.
Disclosure of interest: No

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INTRAVENOUS THROMBOLYSIS FOR ACUTE ISCHEMIC STROKE IS ASSOCIATED WITH LOWER RISK OF POST-STROKE DEMENTIA: A NATIONWIDE REGISTER-BASED COHORT STUDY

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Background and aims: Post-stroke dementia is common and is of great concern for patients and their caregivers. The objective was to investigate if intravenous thrombolysis (IVT) for acute ischemic stroke (AIS) was associated with lower risk of post-stroke dementia.
Methods: When IVT was introduced in Denmark, not all eligible patients were treated due to restricted access. We conducted a nationwide register-based cohort study of all AIS patients in Denmark from 2004-2011. IVT-treated patients were compared with IVT-eligible but non-treated patients. The two groups were matched by propensity score. Cox proportional hazards regression was used to estimate the hazard ratio for post-stroke dementia defined as a diagnosis of vascular or mixed dementia within seven years from index stroke. Secondary outcome was all-cause dementia within seven years from index stroke.
Results: Before matching, 6.287 patients were eligible for the study. A propensity score for IVT treatment was computed, and 2334 IVT-treated patients were matched with 2334 non-treated IVT-eligible patients with a similar propensity score. After matching, baseline characteristics were balanced between groups. Mean (SD) age was 66.4 (13.3), 61.4% were male and median (IQR) Scandinavian stroke scale score was 43 (28-52). Hazard ratio for post-stroke dementia was 0.45 (0.29-0.70, $p < 0.001$) for the IVT-treated patients compared with non-treated IVT-eligible patients and 0.43 (0.27-0.67, $p < 0.001$) when adjusting for time from symptom onset to hospital arrival. Hazard ratio for all-cause dementia was 0.68 (0.51-0.92, $p = 0.013$).
Conclusions: Intravenous thrombolysis for AIS was associated with markedly lower risk of post-stroke dementia.
Disclosure of interest: No

SAH, ANEURYSMS AND VASCULAR MALFORMATIONS

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ANTI-NMDA-RECEPTOR ANTIBODIES ARE ASSOCIATED WITH MEMORY IMPAIRMENT 12 MONTHS AFTER STROKE

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Background and aims: Patients suffering from ischemic stroke are at increased risk of developing cognitive decline. Anti-NMDA-receptor antibodies have been linked to functional and cognitive outcome after stroke. Their impact on specific cognitive domains however remains obscure. We therefore investigated the role of anti-NMDA-receptor antibody seropositivity on domain-specific and global cognitive function up to twelve months after stroke.
Methods: Data were obtained from the prospective multicenter DZNE – mechanisms of Dementia after Stroke (DEMDAS) cohort. Anti-NMDA-receptor antibodies were measured in cell-based assays within seven days after stroke. Cognitive function was assessed with a comprehensive neuropsychological test battery at six and twelve months follow up. Cognitive domain specific z-scores were calculated and averaged into a global cognitive score. We used propensity score adjusted linear and logistic regression models to determine the relevance of anti-NMDA-receptor antibody serostatus on domain-specific and global cognitive function.
Results: Data on anti-NMDA-receptor antibodies were available in 570 / 600 patients of whom 58 (10.3 %) were seropositive. In the propensity score adjusted models seropositivity was associated with lower z-scores in the memory domain (β = -0.11, 95%CI = -0.57 – -0.03) and with memory impairment defined as z-score < -1.5 (OR = 3.8, 95%CI = 1.33 – 10.82) at twelve months after stroke. Seropositivity was not associated with lower performance in any other cognitive domain, nor with the global cognitive function.
Conclusions: Our data suggest that anti-NMDA-receptor antibody seropositivity is exclusively associated with memory dysfunction after stroke while other cognitive domains seem to be unaffected thereof.
Disclosure of interest: No

SAH, ANEURYSMS AND VASCULAR MALFORMATIONS

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Cerebral Amyloid Angiopathy and Hypertensive Arteriopathy: cognitive profile comparison in small vessel disease

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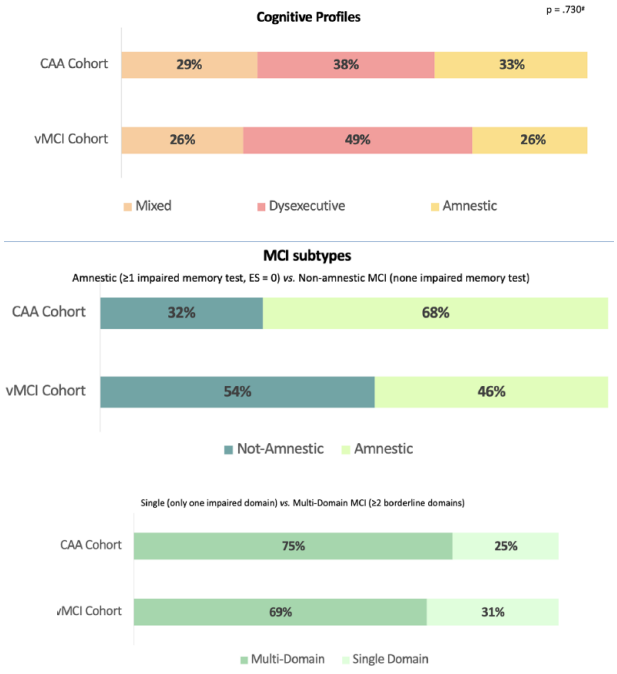
Background and aims: The present study aimed at comparing cognitive profile between CAA and hypertension-related cSVD patients, and at identifying factors associated with cognitive performance.
Methods: The study population was composed of patients with CAA diagnosis (CAA) and patients with mild cognitive impairment and hypertensive cSVD (vMCI). All participants underwent an extensive clinical, neuropsychological, and neuroimaging protocol.
Results: Thirty-two CAA patients (mean age 76±5.8 years) and thirty-nine vMCI patients (mean age 74.1±7.2 years) were included in the analyses. There were not significant differences between the CAA and vMCI groups for demographics, except for sex. The presence of vascular risk factors was greater in the HA cohort compared to the CAA cohort.
Compared to vMCI patients, CAA ones presented a worse performance at MoCA and at semantic fluency.
The amnestic MCI subtype was more frequent in CAA patients compared to vMCI ones (68% vs 46% respectively, p=.087), while there were no differences for cognitive profiles.
Univariate correlation analyses showed that CAA patients with multi-domain MCI performed worse at MoCA, immediate and delayed Rey Auditory Verbal Learning Test (RAVLT) and semantic fluency, while vMCI performed worse at Symbol Digit Modalities Test (SDMT) and phonemic fluency.
Conclusions: Our results confirmed the existence of two potentially distinct patterns of cognitive deficits in CAA or vMCI patients.
While vMCI patients have mainly an attentional/executive cognitive profile, CAA tend to have a more complex profile, with a reduced global cognitive efficiency and a deficit in semantic memory.



Disclosure of interest: No

SAH, ANEURYSMS AND VASCULAR MALFORMATIONS

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AcT-Cog: Cognitive outcomes in the Alteplase compared to Tenecteplase (AcT) Trial

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Background and aims: Stroke is a leading cause of morbidity and mortality resulting in both physical and neurological deficits. Earlier phase II data suggested that TNK may achieve faster reperfusion, which could reduce the cognitive impact in acute stroke.

Methods: Prospective cognitive outcomes were collected at 90-180 days from participants in the Alteplase compared to Tenecteplase (AcT) Trial. All patients enrolled in the parent trial (treated with either tPA or TNK) who were able to complete the parent trial's primary outcome independently were eligible for AcT-Cog. Able patients were invited to complete the telephone Montreal Cognitive Assessment (T-MoCA range 0-22; scores <19 consistent with cognitive impairment) and an online cognitive assessment using the Cambridge Brain Sciences (CBS with memory, reasoning and verbal domains). Differences in T-MoCA and CBS assessments between tPA and TNK was assessed using an ANCOVA and linear regression models adjusted for age, sex, education and 90-day mRS.
Results: 409 people (39% female), average age of 66y$\pm$13, and mRS of 1$\pm$1, with no difference between groups. No significant difference was noted between the treatment groups on average T-MoCA scores (tPA:16.1$\pm$3.6 and TNK:16.4$\pm$3.5), F(1,392) = 0.33, p=0.57. Drug allocation was not a significant predictor of any of the cognitive domains of CBS, namely, Memory(β = 0.018, p=0.89), Reasoning(β = -0.054, p=0.65), and Verbal(β = 0.035, p=0.81).
Conclusions: No differences in cognitive outcomes were noted between patients treated with tPA or TNK. In both groups, the majority of patients exhibited cognitive impairment on T-MoCA, despite high prevalence of good outcomes.
Disclosure of interest: No

SAH, ANEURYSMS AND VASCULAR MALFORMATIONS

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The Boston criteria V2.0 for cerebral amyloid angiopathy in a memory clinic

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Background and aims: The V2.0 Boston criteria incorporated non-hemorrahagic MRI markers, in addition to strictly lobar hemorrhagic lesions, to diagnose cerebral amyloid angiopathy (CAA), increasing the diagnostic performance in patients with intracerebral hemorrhage, cognitive impairment, or transient focal neurological episodes. To determine generalizability of those criteria, we aimed to assess them in a cohort of cognitively normal elderly with memory complaint.
Methods: Cognitively normal elderly with memory complaint from the INSIGHT-preAD study were assessed with multimodal explorations at baseline, including 3T MRI scan. Cerebral microbleeds (CMB), cortical superficial siderosis (CSS), enlarged perivascular spaces (EPVS) and white matter hyperintensities (WMH) were rated according to validated scales and guidelines. CAA Boston criteria V1.5 and V2.0 were applied.
Results: Among the 318 subjects (age: 76.4 [74.1, 78.5] years, 63.2% women) enrolled, 41 (12.9 %) had at least one lobar CMB, 4 (1.3%) CSS, 68 (21.7%) severe EPVS in the centrum semiovale and 245 (77.0%) WMH with a spot pattern $\geqslant$10. According to the V1.5 and V2.0 criteria, the respectively prevalence of probable CAA was 2.8% and 10.4% and possible CAA was 8.8% and 68.6%. Compared to non-CAA subjects (n=67, 21.1%), those with V2.0 probable CAA (n=33) were not different on demographics and vascular risk factors, had more executive dysfunction, and tended to be associated with Apoe4 status and lower hippocampal volume.
Conclusions: The V2.0 Boston criteria increases the prevalence of CAA in a population of elderly with isolated memory complaint. The diagnostic accuracy may be estimated using in vivo non-MRI biomarkers of CAA.
Disclosure of interest: No

SAH, ANEURYSMS AND VASCULAR MALFORMATIONS

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Structural white matter disconnections are associated with multidomain deficits in left-hemisphere stroke patients

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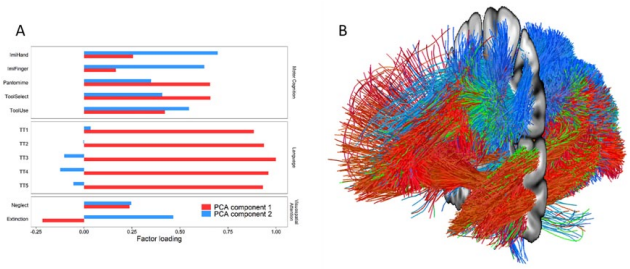
Background and aims: Single stroke lesions lead to behavioural deficits in different cognitive domains. We investigated the behavioural variance after stroke in a prospective cohort of 165 acute stroke patients and aimed to identify how white matter disconnection can help to explain the behavioural variance after stroke using a global tractography disconnectome mapping approach.
Methods: Patients (n=165, 64.4$\pm$14.3 years) with first left-hemispheric stroke were examined in the acute stage after stroke (4.8$\pm$2.1 days after stroke) for aphasia, apraxia, and visuospatial attention deficits. Common variance in behavioural data was explored with oblimin-rotated principal component analysis (PCA). White matter injury was determined using a novel disconnectome mapping approach (streamline-based lesion-symptom mapping), which maps individual lesions on a healthy connectome previously established with global tractography.
Results: Behavioural variance was explained by two components (Figure A): The first component comprised all semantic/conceptual tasks. The second component represented tasks relying on time- and space dependent processing. White matter damage to extreme capsule fibers was related only to the first semantic/conceptual component, damage to dorsal fibers (superior longitudinal fascicle) was only related to the second time-and-space-dependent component. White matter damage related to both behavioural clusters overlapped in the arcuate fascicle (Figure B).
Conclusions: Post-stroke cognitive deficits might be reduced to two underlying sets of cognitive processes, which in turn can be mapped onto the two large white matter fiber systems. Our findings show that single stroke lesions might affect common cognitive processes and strengthen



the relevance of white matter disconnection to explain multidimensionality in post-stroke deficits.
Disclosure of interest: No

SAH, ANEURYSMS AND VASCULAR MALFORMATIONS

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ENLARGED PERIVASCULAR SPACES IMPEDE COGNITIVE PERFORMANCE, BUT NOT OVER AND ABOVE WHITE MATTER HYPERINTENSITIES

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Background and aims: The consequences of cerebral enlarged perivascular spaces (ePVS) on cognition remain ambiguous [1]–[3]. We studied the relationship between ePVS and cognition in 397 subjects along the Alzheimer's disease (AD) continuum (Controls=81/Subjective Cognitive Decline=151/Mild Cognitive Impairment=79/AD=45/AD relatives=41).
Methods: We computationally quantified baseline white matter hyperintensities (WMH), basal ganglia (BG) and centrum semiovale (CSO) ePVS volumes in participants of the multicentre DELCODE study [4]. Applying a comprehensive cognitive test battery [4] and confirmatory factor analysis, we established cognitive domains scores (*memory/working memory/language/executive/visuospatial*) [5]. We also assessed baseline preclinical Alzheimer's cognitive composite (PACC5) score [6].
We studied regional ePVS in relation to cognitive performance using multiple linear regression, controlling for demographics, hypertension, pTau181, and image acquisition-related quality. We compared null models (covariates only) to models enriched by either ePVS, WMH, or their shared variance represented by three principal components **(Fig.1)** to determine their contributions to performance differences.
Results: BG- and CSO-ePVS were negatively, but insignificantly, associated with memory performance **(Table 1)**.
Additionally, CSO-ePVS were associated with worse language (*B*=-0.06, *95%-CI*[-0.12;-0.01]) and PACC5 (*B*=-0.07, *95%-CI*[-0.13;-0.00]) performance **(Table 1)**. EPVS' impact on other domains remained insignificant. While CSO-ePVS related to cognitive performance differences ($p<0.05$), WMH contributed more substantially – even beyond shared variance of ePVS and WMH (memory: $R^2_{CSO\text{-}ePVS}=0.321<R^2_{Principal\text{-}Components}=0.360<R^2_{WMH}=0.363$; language: $R^2_{CSO\text{-}PVS}=0.304<R^2_{Principal\text{-}Components}=0.351<R^2_{WMH}=0.354$; PACC5: $R^2_{CSO\text{-}PVS}=0.233<R^2_{Principal\text{-}Components}=0.272<R^2_{WMH}=0.275$).
Conclusions: Given BG's role in cognition [7] and the susceptibility of cognitively relevant association fibres in CSO to AD-progression [8]-[9],

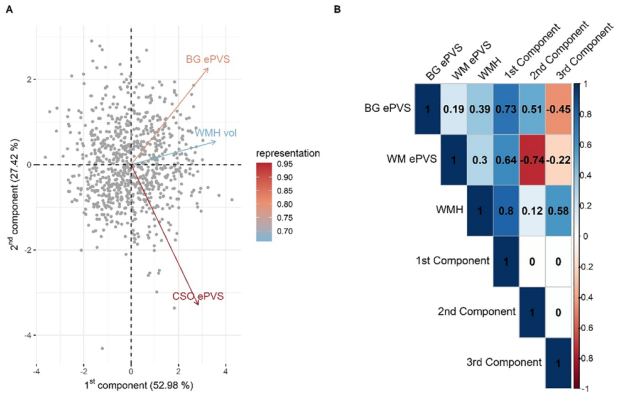

Figure 1. Results of Principal Component Analysis identifying three main components. (A) Representation of the variables on the first two principal components. **(B)** Correlation of BG-ePVS, CSO-ePVS and WMHvol with components of principal component analysis. The first component reflects the overall burden of WMH and ePVS. The second component weights the absence of CSO-ePVS but the presence of BG-ePVS. The third component rises with the presence of WMH but decreases with presence of both CSO-ePVS and BG-ePVS

ePVS in these regions may explain deterioration in cognitive processes. Nonetheless, WMH predict cognitive impairment better [10].

Table 1. Effects of ePVS and WMH on memory, language performance and the PACC5 score over and above demographics, hypertension and pTau. BG- negatively related to memory performance, while CSO ePVS were negatively associated with memory, language performance and the PACC5 score. However, WMH explain significantly more variance in cognitive performance.

			(Intercept)	age	age²	hypertension	sex	Years of education	Imaging quality	pTau181	Age * Hypertension	BG-ePVS	CSO-ePVS	WMH	1st Principal Component	2nd Principal Component	3rd Principal Component	R^2/ R^2adj
Memory (p=.576)	Null model	β	2.84	-0.26	-0.03	-0.07	0.16	0.25	-0.12	-0.66	-0.00							0.351 / 0.317
		SE	0.39	0.06	0.08	0.04	0.08	0.04	0.10	0.10	0.09							
		p	<0.001	<0.001	0.699	0.143	0.051	<0.001	0.225	<0.001	0.975							
	BG-ePVS model	β	2.72	-0.24	-0.00	-0.08	0.15	0.24	-0.11	-0.65	-0.00	-0.13						0.357 / 0.321
		SE	0.40	0.07	0.08	0.05	0.08	0.04	0.10	0.10	0.09	0.07						
		p	<0.001	<0.001	0.722	0.097	0.058	<0.001	0.235	<0.001	0.964	0.077						
	CSO-ePVS model	β	2.69	-0.25	-0.01	-0.06	0.15	0.25	-0.11	-0.65	-0.00		-0.05					0.357 / 0.321
		SE	0.40	0.06	0.08	0.04	0.08	0.04	0.10	0.09	0.09		0.03					
		p	<0.001	<0.001	0.875	0.188	0.072	<0.001	0.276	<0.001	0.964		0.106					
	WMH model	β	2.75	-0.15	0.02	-0.07	0.15	0.22	-0.14	-0.64	-0.02			-0.13				0.378 / 0.343
		SE	0.37	0.07	0.07	0.04	0.08	0.04	0.09	0.09	0.08			0.03				
		p	<0.001	0.027	0.803	0.106	0.061	<0.001	0.130	<0.001	0.827			<0.001				
	Shared variance model	β	2.77	-0.15	-0.07	0.02	0.15	0.22	-0.14	-0.64	-0.02				-0.15	-0.03	-0.15	0.379 / 0.360
		SE	0.38	0.07	0.04	0.07	0.08	0.04	0.09	0.09	0.08				0.03	0.05	0.05	
		p	<0.001	0.030	0.109	0.737	0.067	<0.001	0.138	<0.001	0.833				<0.001	0.489	0.004	
Language (p=.574)	Null model	β	2.20	-0.29	-0.04	-0.08	0.07	0.24	-0.08	-0.51	0.04							0.312 / 0.297
		SE	0.38	0.06	0.07	0.04	0.08	0.04	0.10	0.09	0.08							
		p	<0.001	<0.001	0.587	0.062	0.350	<0.001	0.410	<0.001	0.652							
	CSO-ePVS model	β	2.03	-0.28	-0.07	-0.02	0.06	0.25	-0.07	-0.50	0.04		-0.06					0.321 / 0.304
		SE	0.39	0.06	0.04	0.07	0.08	0.04	0.10	0.09	0.08		0.03					
		p	<0.001	<0.001	0.099	0.793	0.439	<0.001	0.488	<0.001	0.668		0.053					
	WMH model	β	2.11	-0.18	-0.08	0.01	0.06	0.21	-0.11	-0.49	0.02			-0.14				0.360 / 0.344
		SE	0.36	0.06	0.04	0.07	0.07	0.04	0.09	0.09	0.08			0.02				
		p	<0.001	0.004	0.041	0.926	0.411	<0.001	0.259	<0.001	0.774			<0.001				
	Shared variance model	β	2.13	-0.19	-0.08	0.01	0.06	0.22	-0.10	-0.49	0.02				-0.14	0.00	-0.18	0.371 / 0.351
		SE	0.36	0.06	0.04	0.07	0.08	0.04	0.09	0.09	0.08				0.03	0.04	0.05	
		p	<0.001	0.003	0.060	0.852	0.431	<0.001	0.268	<0.001	0.786				<0.001	0.966	<0.001	
PACC5 (p=.648)	Null model	β	1.30	-0.30	0.04	-0.04	0.22	0.23	-0.06	-0.42	0.11							0.240 / 0.228
		SE	0.42	0.07	0.08	0.04	0.08	0.04	0.10	0.10	0.09							
		p	0.002	<0.001	0.642	0.384	0.004	<0.001	0.588	<0.001	0.214							
	CSO-ePVS model	β	1.15	-0.29	-0.03	0.05	0.20	0.23	-0.04	-0.42	0.11		-0.07					0.253 / 0.233
		SE	0.42	0.07	0.04	0.08	0.08	0.04	0.10	0.10	0.09		0.03					
		p	0.007	<0.001	0.451	0.494	0.008	<0.001	0.690	<0.001	0.220		0.039					
	WMH model	β	1.34	-0.19	-0.05	0.06	0.21	0.21	-0.08	-0.43	0.09			-0.12				0.294 / 0.275
		SE	0.40	0.07	0.04	0.08	0.08	0.04	0.10	0.10	0.09			0.03				
		p	0.001	0.010	0.265	0.505	0.005	<0.001	0.388	<0.001	0.327			<0.001				
	Shared variance model	β	1.37	-0.19	-0.06	0.06	0.21	0.21	-0.08	-0.43	0.08				-0.13	0.01	-0.16	0.296 / 0.272
		SE	0.41	0.07	0.04	0.08	0.08	0.04	0.10	0.10	0.09				0.03	0.04	0.05	
		p	0.001	0.009	0.324	0.279	0.007	<0.001	0.415	<0.001	0.339				<0.001	0.820	0.001	

Disclosure of interest: No

SAH, ANEURYSMS AND VASCULAR MALFORMATIONS

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BASELINE CEREBRAL BLOOD FLOW IS RELATED TO COGNITIVE DECLINE OVER 2 YEARS IN PATIENTS WITH VASCULAR COGNITIVE IMPAIRMENT

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Background and aims: Chronic cerebral hypoperfusion is one of the assumed pathophysiological mechanisms in vascular cognitive impairment (VCI). Cerebral blood flow (CBF) has been shown to be lower in VCI patients compared to controls. In this study, we investigated the association between baseline CBF and cognitive decline over 2 years in VCI patients and controls.

Methods: 181 participants (92 VCI and 89 controls) of the Heart-Brain Connection Study (mean age 66 ± 7 years, 44% women) underwent arterial spin labeling (ASL) magnetic resonance imaging (MRI) at baseline, and completed neuropsychological assessment (covering the domains of memory, language, attention and psychomotor speed, and executive functioning) at both baseline and 2 years follow-up. The association between baseline CBF and cognitive decline was determined with multivariable regression analysis, corrected for age, sex, educational level, participant group, study center, baseline relative WMH volume and baseline relative brain volume.

Results: Lower global CBF at baseline was associated with stronger global cognitive decline (St β=0.172 [95% CI 0.019 – 0.344]), and stronger cognitive decline in attention/psychomotor speed (St β=0.227 [95% CI 0.071 – 0.397]). Lower temporal and frontal CBF at baseline were additionally associated with stronger cognitive decline in memory (St β=0.200 [95% CI 0.040 – 0.360], and St β=0.183 [95% CI 0.029 – 0.327], respectively).

Conclusions: This longitudinal study showed that lower CBF at baseline is associated with stronger cognitive decline over 2 years of follow-up in VCI patients and controls. These results support the role of hypoperfusion in the pathophysiological and clinical progression of VCI.

Disclosure of interest: No

SAH, ANEURYSMS AND VASCULAR MALFORMATIONS

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STROKE SEVERITY, COGNITION AND MOOD EARLY AFTER STROKE: THE RATES, RISKS AND ROUTES TO REDUCE VASCULAR DEMENTIA (R4VAD) STROKE STUDY; A PROSPECTIVE UK-WIDE OBSERVATIONAL STUDY

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Background and aims: Cognitive decline and mood disorders are two major concerns of people affected by stroke. R4VaD is a UK-wide longitudinal observational study aiming to examine risk factors for post-stroke cognitive and mood disorders up to two years post-stroke. Here we assessed admission stroke severity and cognition/mood up to 14 weeks post-stroke.

Methods: R4VAD included patients with stroke of all subtypes and severities, collected clinical, cognitive and mood data at baseline (within six-weeks post-stroke), subacutely (6+/-2 weeks later; ie. maximum 14-weeks post-stroke), 1 and 2 years. We measured stroke severity at admission (National Institute of Health Stroke Scale. NIHSS), cognition (Montreal Cognitive Assessment, MoCA; and Modified Telephone Interview for Cognitive Status, TICS-m), and mood (Zung depression scale; General Anxiety Disorder scale, GAD-7). We assess baseline and subacute cognition and mood using linear models with log-transformed NIHSS, adjusted for age, sex, education, hypertension, diabetes and smoking.

Results: We recruited 2442 participants (mean age=68.2 SD=13.50; 40% female; median admission NIHSS=4.0, range=0-35; median stroke onset to recruitment=5 days, IQR=3-13; median time to follow-up=6.6

weeks,IQR=6.0-7.9). Table 1 shows baseline and subacute cognition and mood scores. Higher NIHSS was associated with lower cognition (MoCA: baseline: β=-0.18, p<0.001, subacute T-MoCA: β=-0.16, p<0.001; TICS-m: baseline: β=-0.12, p<0.01, subacute β=-0.12, p<0.001) and increased depressive symptoms (Zung: baseline β =0.12, p<0.01, subacute β=0.07, p<0.01), but not anxiety (baseline β=0.02, p=0.33, subacute β=0.02, p=0.38).

Conclusions: Stroke severity associates with reduced cognition and symptoms of depression, but not anxiety, soon after stroke and 6-14 weeks later. Long-term follow-up is continuing.

Table 1: Scores on measures of cognition and mood at baseline and subacutely.

	Baseline	Subacute (6+/-2 weeks post-baseline)
	Mean (SD)	
MoCA (/30)	24.06 (4.25)	-
T-MoCA (/22)	-	17.82 (3.46)
TICS-m (/37)	23.80 (5.1)	24.78 (6.73)
Zung depression scale (/80)	46.0 (13.33)	41.34 (17.15)
GAD-7 (/21)	4.0 (4.8)	3.64 (4.35)

Disclosure of interest: No

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PREDICTORS AND PROGNOSTIC SIGNIFICANCE OF INCIDENT ISCHEMIC LESIONS WITHIN SIX MONTHS AFTER STROKE

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Background and aims: Incident ischemic lesions (IIL) are common in the general population and associated with risk of dementia. We explored the predictors and prognostic significance of IIL within six months after stroke.

Methods: 503 acute stroke patients from a prospective multicenter study in Germany (DEDEMAS-DEMDAS) underwent MRI at baseline and six months. IIL were determined on the co-registered follow-up scans. Baseline predictors of IIL and associations with cognitive and functional outcomes, and recurrent stroke/TIA across 36 months were explored. We further examined the mediating effects of IIL on the relationship between global cerebral small vessel disease (SVD) score and cognitive outcomes at 36 months.

Results: 78 patients (15.5%) had IIL. Out of those at six months after stroke, 48 (61.5%) had a single IIL and 69 (88.5%) showed no associated clinical manifestations. Age and SVD markers were associated with IIL. The presence of IIL was associated with worse performance in global cognitive function (OR for cognitive impairment=2.86, 95%CI=1.82-4.49), executive function, memory, attention, language, and visuospatial ability, worse functional outcome (OR for mRS>1=2.41, 95%CI=1.56-3.71; OR for mRS>2=2.81, 95%CI=1.46-5.38), and recurrent stroke/TIA (HR=2.94, 95%CI=1.49-5.80) across a 36-month follow-up. Sensitivity analyses for the number of IIL were largely consistent. Presence of IIL showed a mediating effect on the relationship between a global SVD score and cognitive impairment.

Conclusions: SVD burden is associated with IIL, which in turn are associated with worse cognitive and functional outcome, as well as recurrent stroke/TIA after stroke. Assessing IIL six months post-stroke may aid clinical prognostication.

Disclosure of interest: No

SAH, ANEURYSMS AND VASCULAR MALFORMATIONS

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Central Autonomic Network lesions and functional outcome at 90 days after acute ischemic stroke

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Background and aims: Autonomic disturbances may occur in patients with acute ischemic stroke and are caused by affection of the central autonomic network (CAN) including the ventral prefrontal

cortex, cingulate cortex, amygdala, right anterior insular cortex, and left posterior insular cortex. These structures are also involved in the acquisition of fine motor skills, but their role in the functional status of stroke patients has been poorly studied. Therefore, we aimed to determine if CAN lesions influenced the functional outcome 90 days after acute ischemic stroke.

Methods: We prospectively included 340 patients with anterior circulation stroke, a modified Rankin Score (mRS) $\leqslant 4$, and without other central nervous system disorders. Brain CT scans at admission and after 24 hours were reviewed to determine the final infarct volume using semi-automated volumetry. Imaging findings were collected regarding the affected CAN structure, ASPECTS score, and stroke etiology.

Results: The patients' mean age was 68 years (standard deviation 13) and 64% were males. The affection of CAN was infrequent, ranging from 11% (n=43) on the left posterior insula to 0.5% (n=2) on the cingulate cortex. Univariate regression analysis showed that involvement of the left posterior insula, amygdala, and frontobasal cortex was associated with worse functional outcome (mRS 3-6) at 90 days ($p<0.05$), but not when controlled to age, stroke severity, and infarct volume.

Conclusions: CAN structures impairment does not seem to influence the functional outcome of acute anterior circulation ischemic stroke patients.

Disclosure of interest: No

SMALL VESSEL DISEASE

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Cerebrospinal fluid clearance dysfunction in Hemorrhagic Small Vessel Disease

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Background and aims: The exchange of ISF and CSF involves in cerebral β-amyloid clearance. We investigated whether SVD, including cerebral amyloid angiopathy (CAA) and hypertensive deep perforator arteriopathy (DPA), will alter CSF clearance function.

Methods: 154 ICH survivors (50 CAA, 104 DPA) with MR and amyloid PET imaging studies were included. We assessed CSF clearance by measuring PiB SUVR in the lateral ventricles (vSUVR). Radiological markers of SVD were assessed according to STRIVE Criteria. We defined modified SVD score using microbleed, WMH, BG-PVS, lacune and cSS. Clinical and imaging characteristics associated with vSUVR were evaluated in linear models.

Results: Decreased vSUVR is significantly correlated to age ($p < 0.001$), cortical amyloid retention ($p < 0.029$), WMH volume ($p = 0.016$) and cSS ($p = 0.003$). After age and sex adjustment, vSUVR shows a correlation to modified SVD score (standardized β -0.235, $p = 0.004$), but not to individual SVD markers. vSUVR were similar between CAA and DPA (0.52 ± 0.21 vs. 0.53 ± 0.24, $p = 0.767$). In CAA, age ($p = 0.001$) and SVD score ($p = 0.03$) both independently contribute to decreased vSUVR. The vSUVR also shows correlation to cortical amyloid load ($p = 0.008$); in DPA, vSUVR is correlated to age ($p = 0.012$) but not SVD score ($p = 0.151$), and is not associated with cortical amyloid load ($p = 0.444$).

Conclusions: Age, WMH and cSS are associated with CSF clearance dysfunction. In CAA, both age and accumulating SVD pathology may result in impaired β-amyloid clearance.

Disclosure of interest: No

SMALL VESSEL DISEASE

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The association of retinal microvasculature with gray matter changes and structural covariance network: a voxel-based morphometry study

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Background and aims: To unravel the association of retinal microvasculature with gray matter changes and structural covariance network using a voxel-based morphometry(VBM) analysis.

Methods: One hundred and forty-four volunteers without previously known neurological diseases were recruited from West China Hospital between April-2021 and December-2021. Retinal microvasculature of superficial vascular plexus(SVP), intermediate capillary plexus(ICP), and deep capillary plexus(DCP) were measured by optical coherence tomography angiography using an automatic segmentation. The VBM and structural covariance network analyses were applied to process brain MRI images.

Results: In the study, 137 participants(mean age:59.72 years, 37.2% men) were included for the final analysis. Poor microvascular changes in SVP were significantly associated with reduced voxel-wise gray matter volumes of the brain regions including the insula, putamen, occipital, frontal and temporal lobe, all of which were located in the anterior part of the brain supplied by internal carotid artery, except the occipital lobe. In addition, these regions were also involved in visual processing and cognitive impairment(such as left inferior occipital gyrus, left lingual gyrus, and right parahippocampal gyrus). In regard to the structural covariance, the SVP were positively related to the structural covariance of the left lingual gyrus seed with the left middle occipital gyrus, the right middle occipital gyrus, and the left middle frontal gyrus.

Conclusions: Poor perfusion in SVP was correlated with reduced voxel-wise gray matter volumes and structural covariance networks in regions related to visual processing and cognitive impairment. It suggests that retinal microvasculature may offer a window to identify aging related cerebral alterations.

Disclosure of interest: No

SMALL VESSEL DISEASE

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Distinct roles of cerebral pulsatility in various imaging markers of cerebral small vessel disease: a longitudinal community-based study

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Background and aims: Cerebral pulsatility is thought to be sensitive to arterial stiffness and downstream microvascular resistance, while its association with cerebral small vessel disease is under debate. We aimed to explore relationships of cerebral pulsatility with progression of various SVD imaging markers among the community-dwelling elderly.

Methods: The study population was composed of the dementia- and stroke-free community elderly from Shanghai Aging Study (SAS) cohort. Pulsatility index (PI) was quantified for anterior and posterior circulation via transcranial doppler ultrasound (TCD) at baseline. SVD imaging markers were evaluated with both baseline and follow-up MRI scans. The relationship between cerebral pulsatility and SVD burden was analyzed by univariable and multivariable regression models.

Results: Our study population consisted of 188 participants with baseline MRI scans and TCD assessments during 2010 to 2011 (median age,

70 years; 93(49.5%) men), among which 100 participants repeated MRI scans after a 7-year interval. At baseline, increased pulsatility of posterior circulation was associated with periventricular white matter hyperintensities (PWMH) and enlarged perivascular spaces in basal ganglia (BG-ePVS). Longitudinally, higher posterior pulsatility predicted greater PWMH progression in participants with hypertension (β=2.694, SE=1.112, P=0.020), while pulsatility of anterior circulation was shown to prevent BG-ePVS progression among the followed-up elderly (β=-6.737, SE=2.685, P=0.012). However, no significant relationship was found between cerebral pulsatility and burden of lacunes or CMBs.

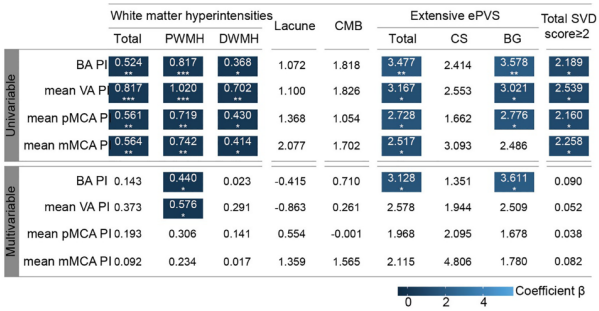

Figure 1. Associations between cerebral pulsatility and severity of SVD imaging markers at baseline.
Top: univariable regression analyses. Bottom: multivariable regression analyses.
Colored cells represent statistically significant components (p<0.05).
Color gradient reflects regression coefficients.

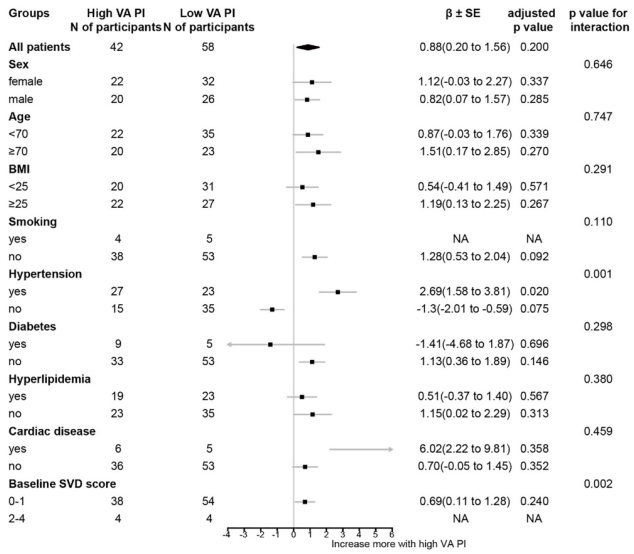

Figure 2. Subgroup analysis for prediction of high VA PI on PWMH progression during follow-up.
Group of high VA PI means participants with baseline VA PI > 0.812.
Bold represents statistically significant components (p<0.05).

Table 1 Associations between mMCA PI and BG-ePVS progression during follow-up in multivariable logistic regression analysis.

Independent variables	variable types	β (SE)	OR	95%CI	*p*
Model 1					
mMCA PI	continuous	-6.083 (2.408)	NA	NA	**0.012**
	T2 vs T1	-0.773 (0.666)	0.246	(0.125, 1.704)	0.246
	T3 vs T1	-2.118 (0.937)	0.120	(0.019, 0.755)	**0.024**
Model 2					
mMCA PI	continuous	-6.737 (2.685)	NA	NA	**0.012**
	T2 vs T1	-0.408 (0.733)	0.665	(0.150, 2.798)	0.578
	T3 vs T1	-2.428 (1.106)	0.008	(0.007, 0.625)	**0.028**

Model 1: adjusted for baseline age, sex, and interval time;
Model 2: additionally adjusted for baseline body mass index, hypertension, diabetes, hyperlipidemia, cardiac disease, smoking, baseline SVD score.

Conclusions: Higher pulsatility of posterior circulation could worsen PWMH progression, especially for participants with hypertension. The distinct relationships between cerebral pulsatility and various SVD markers emphasized the importance of individualized SVD management.
Disclosure of interest: No

SMALL VESSEL DISEASE

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Structural network efficiency predicts conversion to incident parkinsonism in patients with cerebral small vessel disease

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Background and aims: To investigate whether structural network connectivity is associated with parkinsonian signs and their progression, as well as increased risk of incident parkinsonism.
Methods: In a prospective cohort (RUN DMC study) with 293 older participants with SVD, we performed 1.5T MRI scans and assessed parkinsonian signs and incident parkinsonism over an 8-year follow-up. In addition, we reconstructed the white matter network to compute the network metrics. Conventional MRI markers for SVD were assessed according to STRIVE criteria.
Results: We included 293 SVD patients free of parkinsonism at baseline (2011), mean age 68.8 years, men 44.4%. Compared with participants without parkinsonism, patients with all-cause parkinsonism had higher UPDRS scores and lower network metrics, i.e., global and local efficiency at baseline. Baseline global efficiency was associated with UPDRS motor scores in 2011 and 2015 (beta=-0.047 and -0.84, both p<0.001), as well as the changes in UPDRS scores during the 4-year follow-up (beta=-0.63, p=0.004). At the regional level, we identified an inter-hemispheric decreased subnetwork associated with increased UPDRS motor score

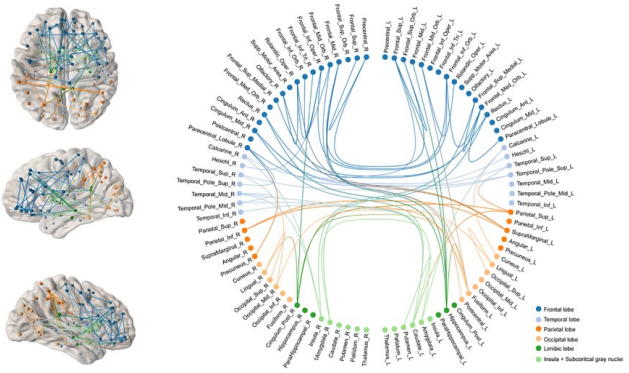

Figure 1. Subnetwork related to UPDRS motor score.

(Figure 1). Besides, lower global efficiency was associated with an increased risk of all-cause parkinsonism (HR=0.73, P=0.029)(Figure 2).
Conclusions: Global efficiency is associated with a gradual decline in motor performance, ultimately leading to incident parkinsonism in the elderly with SVD. Structural network efficiency may have the potential to serve as a useful marker to capture changes in motor signs.

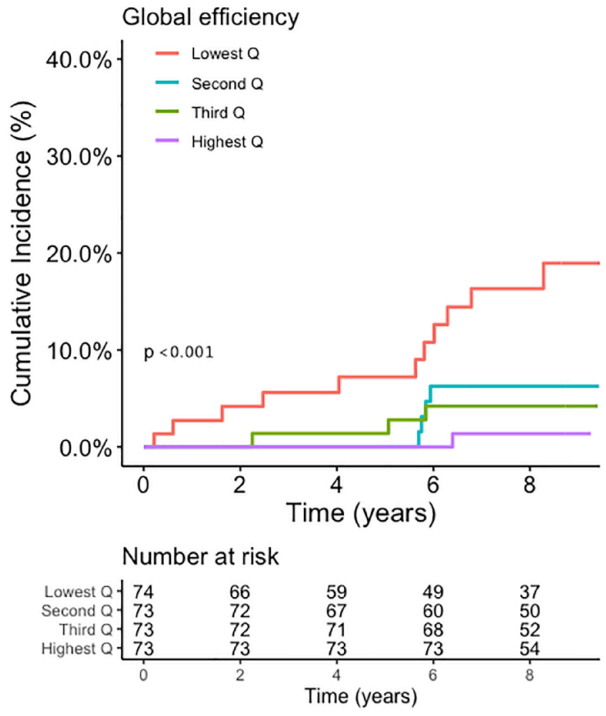

Figure 2. The cumulative risk for all-cause parkinsonism with respect to baseline global efficiency

Disclosure of interest: No

SMALL VESSEL DISEASE

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Association of heart rate variability with presence, burden, markers of cerebral small vessel disease

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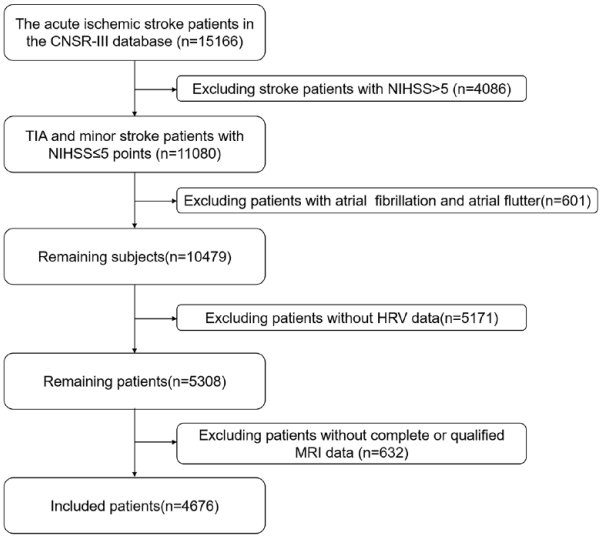
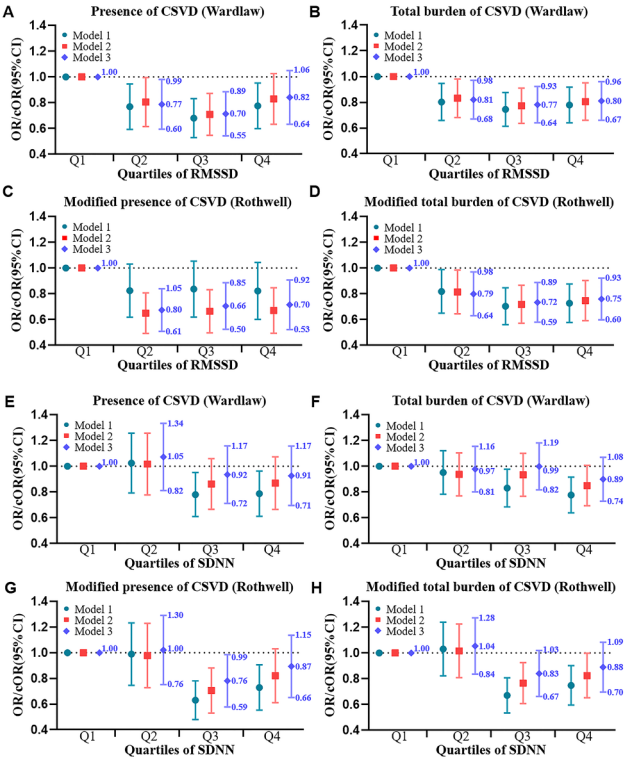
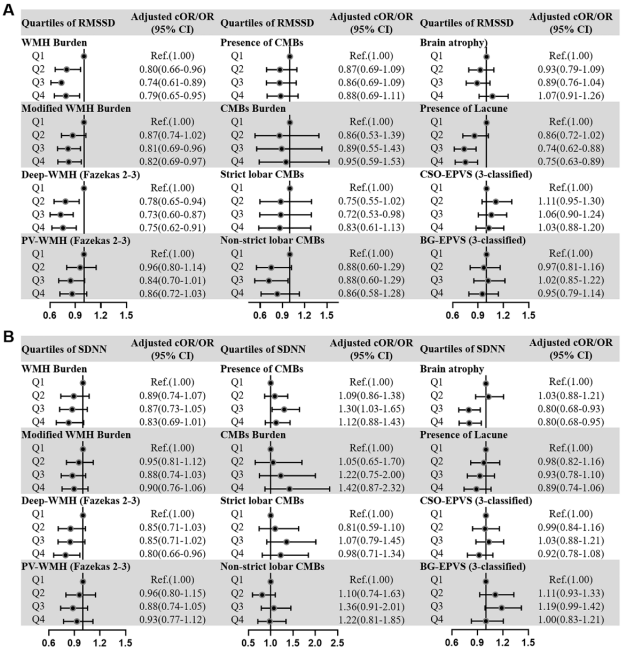
Background and aims: This study aimed to investigate associations between heart rate variability (HRV) and presence, total burden, and imaging markers of cerebral small vessel disease (CSVD).
Methods: A total of 4676 participants were included. CSVD and its markers, including white matter hyperintensity (WMH), lacunes, enlarged perivascular spaces (EPVS), cerebral microbleeds (CMBs), and brain atrophy (BA), were evaluated. Two common HRV parameters, including the square root of the mean of the sum of the squares of differences between adjacent N-N intervals (RMSSD) and the standard deviation of all N-N intervals (SDNN), were used to evaluate anatomic nervous system (ANS). Multiple logistic regression analyses were performed to investigate the association between HRV and CSVD.
Results: RMSSD was significantly associated with total burden of CSVD (Wardlaw, cOR 0.80, 95% CI 0.67–0.96, p=0.02; Rothwell, cOR 0.75, 95% CI 0.60–0.93, p=0.008) and the presence of CSVD (Rothwell, OR 0.75, 95% CI 0.60–0.93, p=0.008). RMSSD was related to WMH burden (OR 0.80, 95% CI 0.66–0.96, p=0.02), modified WMH burden (cOR 0.82, 95% CI 0.69–0.97, p=0.02) and Deep-WMH (OR 0.75, 95% CI 0.62–0.91, p=0.003), while SDNN was related to Deep-WMH (OR 0.80, 95% CI 0.66–0.96, p=0.02) and BA (cOR 0.80, 95% CI 0.68–0.95, p=0.009). Furthermore, adding HRV to the conventional model enhanced the predictive performance for CSVD, as validated by the integrated discrimination index ($p<0.05$).
Conclusions: Decreased HRV may be a potential untraditional risk factor of CSVD, implying the possible role of ANS in the pathogenesis of CSVD.







Disclosure of interest: No

SMALL VESSEL DISEASE

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Symptoms associated with small vessel disease progression and incident infarcts after minor stroke

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Background and aims: Small vessel disease (SVD) lesions may cause symptoms apart from stroke. We aimed to determine whether white matter hyperintensity (WMH) progression and incident infarcts associate with gait, mood, and cognitive symptoms.

Methods: We recruited patients with non-disabling stroke, performed diagnostic MRI, and questioned participants/informants about gait, mood, cognitive, Center Epidemiologic Studies-Depression Scale (CES-D), Neuropsychiatric Inventory-Questionnaire (NPI-Q) symptoms and Informant Questionnaire for Cognitive Decline in the Elderly (IQCODE). Baseline visit occurred <3months post-stroke. We repeated MRI and assessments every 3-6 months for 12 months, assessing WMH change and incident infarcts on DWI/FLAIR. We normalised WMH for intracranial volume. We used linear mixed-effects models, adjusting for age, gait speed, mRS, and time post-stroke for gait symptoms; age, anxiety, MoCA, stroke subtype, and time for cognitive/neuropsychiatric symptoms.

Results: We recruited 230 participants (mean age=65.8 [SD=11.2] years;34% female;56.5% lacunar); median baseline WMH volumes=8.26mL (IQR 3.65-19.0;n=228); one-year=8.24mL (IQR=4.15-20.1;n=203). Incident infarcts (n=110, 82/110 (74.5%) small subcortical) occurred in 53/230 (23%) of patients.

WMH progression associated with falls (OR=4.13 [95%CI=1.6-10.1]); self-reported brain fog (OR=3.13 [1.11-8.82]); increasing NPI-Q (est=2.12 [0.46-3.77] p=0.012). Baseline and one-year WMH volumes were associated with apathy (baseline OR=8.78 [2.56-31.88]; one-year OR=4.83 [1.43-17.26]).

Higher depression scores associated with incident infarcts (mean 15.2 [12.9] with vs 11.9 [SD10.6] without; est=2.26 (0.12-4.4), p=0.038). WMH progression/infarcts were not associated with fatigue, anxiety, memory complaints, confusion, dizziness, or IQCODE scores.

Conclusions: SVD progression following minor stroke co-associates with specific gait/cognitive/mood symptoms. WMH progression and incident infarcts may cause non-focal symptoms which characterise a potential 'SVD syndrome'.

Disclosure of interest: No

SMALL VESSEL DISEASE

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CLINICAL PHENOTYPES ASSOCIATED WITH CEREBROVASCULAR SMALL VESSEL DISEASE – AN OVERVIEW OF SYSTEMATIC REVIEWS

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Background and aims: Cerebrovascular small vessel disease (cSVD), a group of pathologies affecting the small cerebral blood vessels, contributes to stroke, dementia, cognitive decline, and mood disorders. Despite its relevance, a comprehensive overview of its clinical manifestations is currently lacking. An overview of systematic reviews enables synthesis of all available evidence and allows to identify existing gaps and trends in the literature. The aim of this study is to synthesize evidence from systematic reviews on clinical phenotypes associated with cSVD.

Methods: We searched four databases until December 6th, 2022. We defined clinical phenotypes as the clinical presentation of an individual with evidence of cSVD on neuroimaging as per the STandards for ReportIng Vascular changes on nEuroimaging (STRIVE). We assessed methodological quality using the AMSTAR-2 tool.

Results: We included 28 systematic reviews (>1,265,000 participants). Synthesizing evidence on cSVD is a recent phenomenon – nine reviews were published in 2020 or later. Neurocognitive and neuropsychiatric phenotypes were examined the most, particularly in relation to white matter lesions (range of odds ratios, 1.15-1.64 and

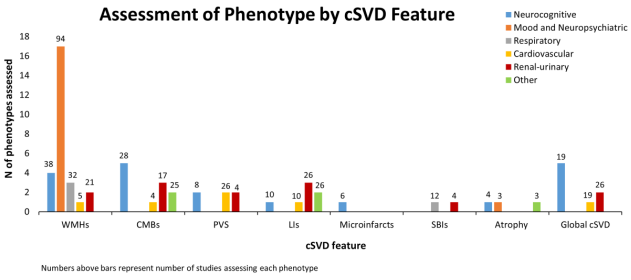

Figure 1. Assessment of clinical phenotypes by cSVD feature.

1.02-4.51, respectively). Fewer studies assessed perivascular spaces and lacunes compared to other cSVD features. Fifteen reviews had high methodological quality, seven – moderate, and six low quality. There was large heterogeneity in outcomes and tools used to measure phenotypes.

Conclusions: Neuroimaging markers of cSVD are associated with various clinical conditions. Neurocognitive and neuropsychiatric phenotypes are studied more extensively than others. Future work should explore the clinical impact of less studied cSVD markers.

Disclosure of interest: No

SMALL VESSEL DISEASE

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WHICH METHOD FOR MEASURING WHITE MATTER HYPERINTENSITIES IN A LONG-TERM COHORT OF CADASIL PATIENTS?

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Background and aims: WMH vary among cSVD patients. Despite their importance for therapeutic evaluation, their follow-up remains challenging in long-term clinical studies using different MRI settings. BIANCA and LST-LPA segmentation methods are widely used as no specific computing system is required. Here we evaluated these approaches in a long-term CADASIL imaging database.

Methods: Data obtained with various MRI settings in age-matched patient groups are described in Table1. WMH were segmented with LPA using FLAIR and probability maps thresholded at 0, and BIANCA, using both FLAIR and T1w, preprocessed to best fit with study-specific training sets and tuned input parameters. Probability maps were automatically and individually thresholded. Manual corrections were considered for comparison.

Results: WMH were significantly underestimated by LPA for all datasets, by BIANCA for 2DFLAIR dataset only (Fig1). For 3DFLAIR, BIANCA provided results with higher sensitivity and Dice than LPA, but more false positives (Fig2). In some individuals, the correction time could reach 2h for LPA.

Conclusions: To segment WMH on 3DFLAIR, BIANCA tuned at individual level appears more reliable than LPA. The manual removal of false positives significantly increased by this approach was easier and less time-consuming than correcting larger under-segmentation produced by LPA.

Table1. Data description.

		2DFLAIR	3DFLAIR_grp1	3DFLAIR_grp2	3DFLAIR_grp3
n		10	10	10	10
Age(y)		40.7±6.3	42.6±4.8	40.1±6.5	42.5±5.8
mRS		0.5±0.5	0.5±0.5	0.5±0.5	0.4±0.5
Field(T)		1.5	3	3	3
Date		2003-2014	2014-2015	2015-2018	2018-2020
FLAIR	TR/TE/TI(ms)	8402/157/2100	6000/386/2200	6000/387/2200	5000/393/1600
	resolution(mm^3)	0.5x0.5x5.5	0.4x0.4x0.9	0.4x0.4x0.9	1.0x1.0x1.0
T1	TR/TE/TI(ms)	8.6/1.9/0	2200/2.4/900	1800/2.4/907	2000/3.2/900
	resolution(mm^3)	1.1x1.1x1.6	1.0x1.0x1.0	0.4x0.4x0.9	0.4x0.4x0.4

Disclosure of interest: No

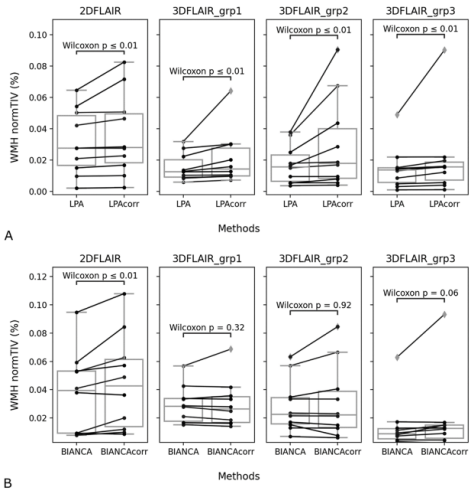

Figure 1: WMH volume normalized by Total Intracavity Volumes (TIV) measured from T1w-MRI before and after manual correction for LPA (A) and BIANCA (B) methods

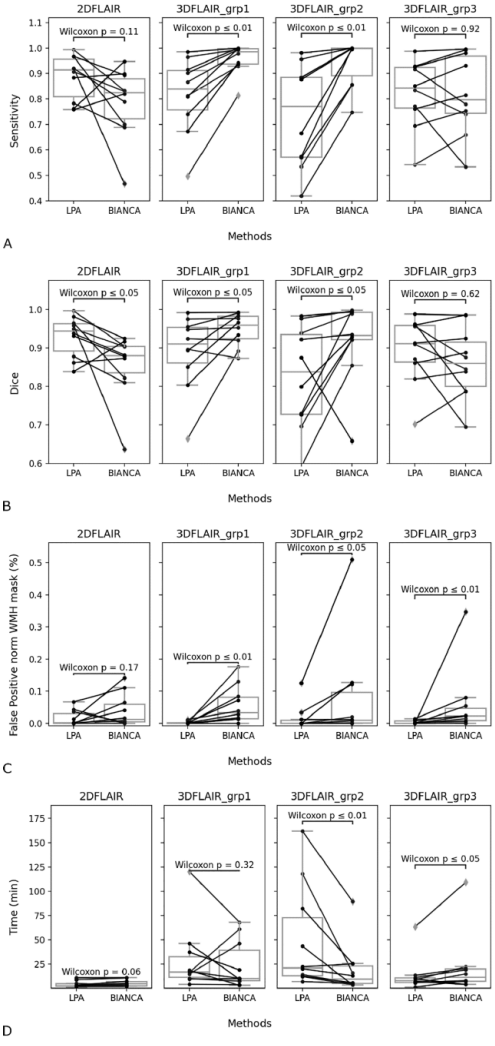

Figure 2: Sensitivity (A), Dice (B), volume of false positive normalized by the volume of WMH without correction (C), and time to correct mask (D) measured from results provided by LPA and BIANCA

SMALL VESSEL DISEASE

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HIGH PREVALENCE OF INCIDENTAL DWI+ LESIONS IN CEREBRAL AMYLOID ANGIOPATHY: RESULTS FROM THE BIONIC STUDY

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Background and aims: Cerebral amyloid angiopathy (CAA) is a common type of cerebral small vessel disease (SVD), which can cause both hemorrhagic lesions and cerebral microinfarcts. While *in vivo* MRI detects hemorrhagic lesions with high sensitivity, the majority of microinfarcts remain invisible during life. Therefore, we applied high-resolution MRI to determine in patients with CAA the prevalence and risk factors of acute (micro)infarcts, defined as incidental diffusion-weighted imaging-positive (DWI+) lesions.
Methods: We included the following groups: patients with probable sporadic CAA or Dutch-type CAA (N=36, 17% with history of symptomatic intracerebral hemorrhage [ICH], all >3 months post-ICH), Alzheimer's disease (N=3), and cognitively unimpaired, stroke-free controls (N=29). Subjects underwent advanced 3T MRI, including multi-shell DWI, MP2RAGE, FLAIR and SWI. DWI scans were manually rated blinded to clinical diagnosis.
Results: Overall, we detected 56 incidental DWI+ lesions in 21/68 subjects. The prevalence of DWI+ lesions was 56% in probable CAA, 0% in Alzheimer's disease, and 2% in controls. In CAA, 32/55 DWI+ lesions represented acute cortical microinfarcts. Patients with CAA and DWI+ lesions did not significantly differ from patients with CAA without DWI+ lesions regarding cardiovascular risk factors, history of ICH and CAA-SVD score.
Conclusions: In patients with CAA, many of whom without a history of symptomatic ICH, we observed a prevalence of incidental DWI+ lesions of 56%. Considering the transient detectability of DWI+ lesions, DWI+ lesions may be found in virtually all CAA patients when repetitively applying high-resolution MRI. Future research needs to determine the clinical relevance of incidental DWI+ lesions.
Disclosure of interest: No

SMALL VESSEL DISEASE

1538

The relationship between small vessel disease with acute intracerebral haemorrhage volume, haematoma expansion, intraventricular extension and outcome: data from the RIGHT-2 and TICH-2 trial

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Background and aims: Radiological markers of small vessel disease (SVD), including leucoaraiosis and old infarcts are often present in patients with acute intracerebral haemorrhage (ICH) but the relationship with haematoma volume, ICH expansion, intraventricular extension and prognosis is unclear. We assessed these relationships using data from the Rapid Intervention with Glyceryl Trinitrate Trial (RIGHT-2) and Tranexamic acid for hyperacute intracerebral haemorrhage (TICH-2) trial.
Methods: Clinical and computed tomography (CT) data from participants recruited to the sham/control arms in RIGHT-2 and TICH-2 were included. Expert neuroradiologists adjudicated CT's for ICH features and SVD markers blinded to clinical data. Haematoma expansion was defined as an increase of >6 ml or >33% on 24 hour CT compared to baseline. Poor outcome was defined as modified Rankin scale (mRS) of >3 at day 90. Logistic regression was performed to assess the relationship between leucoaraiosis and old infarcts on ICH volume, haematoma expansion, intraventricular extension, early neurological deterioration, death at day 7 and day 90 and mRS.
Results: Of the 1233 participants, 45.5% had leucoaraiosis and 60.4% had old infarcts on baseline CT. There was no relationship between leucoaraiosis or old infarcts and haematoma volume, expansion and intraventricular extension. Leucoaraiosis was not associated with early neurological deterioration, death at day 7 or day 90 but increased the odds of poor functional outcome (mRS >3 at day 90, aOR 1.60, 95% CI 1.16-2.24; p=0.005). There was no association between old infarcts and outcomes.
Conclusions: Leucoaraiosis is associated with poor outcome after ICH but not haematoma expansion.
Disclosure of interest: No

SMALL VESSEL DISEASE

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Long-term impact of visit-to-visit Blood Pressure Variability on white matter integrity and cognitive decline in Cerebral Amyloid Angiopathy

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Background and aims: Blood pressure variability (BPV) may contribute to cerebral small vessel disease progression and cognitive impairment, but less is known on the long-term effects of BPV. The authors sought to investigate if long-term BPV is associated with white matter (WM) integrity and cognitive decline in cerebral amyloid angiopathy (CAA).
Methods: This study included non-demented patients recruited from the Massachusetts General Hospital memory-clinic cohort with and without CAA according to modified Boston criteria v1.5. Participants underwent detailed neuropsychological testing and 3T research MRI at baseline and 2-year follow-up. Visit-to-visit BPV was assessed using the coefficient of variation derived from blood pressure measures during the same period. A diffusion tensor imaging marker, peak width of skeletonized mean diffusivity (PSMD), was used to evaluate WM integrity. We used linear regression models to assess the association between BPV and longitudinal PSMD change.
Results: A total of 86 patients were included, 27 (31.4%) with probable CAA. The CAA group had worse WM integrity at baseline (4.16 vs 3.67 x 10^{-4} mm^2/s, p=0.021) and follow-up (4.12 vs 4.07, mm^2/s, p=0.03). We found a strong association between loss of WM integrity and systolic BPV (β 9.51, p=0.048) in the CAA group. Overall, systolic blood pressure was associated with long-term cognitive decline, and processing speed at follow-up (-0.78 vs -0.43, p=0.005).

Conclusions: Our results indicate that long-term BPV is associated with longitudinal microstructural WM injury and cognitive decline, suggesting that there might be a causal effect between BPV and cognitive decline in older adults with CAA.
Disclosure of interest: No

SMALL VESSEL DISEASE

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LONG-TERM EVOLUTION OF RECENT SMALL SUBCORTICAL INFARCTS AND ASSOCIATION WITH COGNITION AT ONE YEAR AFTER LACUNAR STROKE

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Background and aims: Recent small subcortical infarcts (RSSI) may evolve to long-term lacunes (cavities) smaller than 3 mm. Little is known about the cognitive implications associated with the current 3mm lower threshold defined in guidelines. We assessed longitudinal changes in lacunes derived from RSSI to determine the relationship to cognition.
Methods: We included participants with symptomatic MRI-confirmed RSSI from two prospective stroke studies with clinical and cognitive assessment at baseline and 12-months. We measured the RSSI maximum axial diameter and any resulting cavity at baseline and 12-months on T2-FLAIR. We used logistic regression to assess associations between RSSI final cavity size and cognitive outcome (MoCA), adjusted for baseline vascular risk factors (VRF), MoCA and SVD burden.
Results: We included 171 RSSI (mean age 65-years; 35% female). Median onset to baseline MRI 41 days (IQR 32) and to 12-months 401 days (IQR 69). Median baseline RSSI diameter was 8.6 mm (IQR 6.10) and 12-months was 6.6 mm (IQR 4.4). 103/171 (60%) RSSI cavitated partially, 33/171 (19%) completely at 12-months, with median cavity diameter of 4.2 mm (IQR 3.52). At 12 months, the cavity was $<$3mm in 44/171 (26%), and 6/171 (3.5%) RSSI had disappeared. At 12 months, larger final cavity size was associated with worse cognition (MoCA$<$26, OR 18.64; 95%CI: 1.44, 241.41; p=0.025) adjusted for baseline VRF, SVD burden and MoCA score.
Conclusions: Lacune size $>$3mm after RSSI might be associated independently with worse cognition at 12-months. Factors influencing long-term tissue damage might help predict prognosis for cognitive decline after RSSI.
Disclosure of interest: No

SMALL VESSEL DISEASE

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IMPAIRED OXYGEN EXTRACTION AND ADAPTATION OF INTRACELLULAR ENERGY METABOLISM IN CEREBRAL SMALL VESSEL DISEASE

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Background and aims: We aimed to investigate whether combined phosphorous (^{31}P) magnetic resonance spectroscopic imaging (MRSI) and quantitative T_2' mapping are able to detect alterations of the cerebral oxygen extraction fraction (OEF) and intracellular pH (pH_i) as markers the of cellular energy metabolism in patients with cerebral small vessel disease (SVD).
Methods: 32 patients with SVD and 17 age-matched healthy control subjects were examined with 3-dimensional ^{31}P MRSI and oxygenation-sensitive quantitative T_2' mapping at 3 Tesla (T). PH_i was measured within the white matter hyperintensities (WMH) in SVD patients. After segmentation of the cerebral white matter (WM), quantitative T_2' values were averaged across the entire WM. Furthermore, T_2' values were extracted from normal-appearing WM (NAWM) and the WMH and compared between patients and controls.
Results: Quantitative T_2' values were significantly increased across the entire WM and in the NAWM in patients compared to control subjects ($p < 0.05$), indicating increased concentrations of oxygenated hemoglobin. WM T_2' values correlated significantly with the WMH load (r=0.441, p=0.006). Increased T_2' was significantly associated with more alkaline pH_i ($p < 0.05$). Both T_2' and pH_i were significantly positively correlated with vascular pulsatility in the distal carotid arteries (p= 0.001 and p=0.016).
Conclusions: This study found evidence of impaired cerebral OEF in SVD, which is associated with intracellular alkalosis as an adaptive mechanism. The employed techniques provide new insights into the pathophysiology of SVD and might be useful for identifying subjects in a clinically relevant disease stage or at risk of deterioration.
Disclosure of interest: No

SMALL VESSEL DISEASE

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PATIENTS WITH SEVERE SMALL VESSEL DISEASE HAVE AN EXCESS LONG-TERM MORTALITY RISK

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Background and aims: Available evidence suggest an increased mortality risk among patients with cerebral small vessel disease (SVD), but not always consistent.
We therefore prospectively investigated 1) the relation between progression of various SVD-markers and the 15-years mortality risk, and 2) the excess mortality risk of SVD patients compared to the age-and sex-matched general population.
Methods: This study is embedded in the RUN DMC cohort study. At baseline in 2006, and follow-up assessments in 2011, 2015, and 2020 SVD patients underwent a standardized MRI-protocol. MRI-markers of SVD were rated according to STRIVE criteria. Vital status was retrieved from the Dutch Municipal Personal Records database. Annualized rate changes of MRI-markers were estimates with linear mixed-effect models. Excess mortality risk was determined by calculating standardized mortality ratios (SMR) between the SVD cohort and their general population peers.

Results: 503 patients (mean age: 65.7 ± 8.8) were included, of whom 200 (39.9%) died during a median (IQR) follow-up of 15.1 years (12.9-15.5). Of all studied MRI-markers of SVD, only grey matter volume decrease was significantly associated with all-cause mortality (HR 1.3 per 1-SD decrease [95% CI 1.1-1.5]). The SMR for patients with Fazekas 3 compared to the age-and sex-matched general population was 1.5 (95%CI, 1.1-2.0), 1.4 (95%CI, 1.1-1.4) for patients with lacunes, and 1.2 (95% CI, 1.1-1.4) for patients with higher mean diffusivity (**Table 1**).
Conclusions: Patients with severe SVD (Fazekas 3), prevalent lacunes, or decreases microstructural integrity had a higher 15-year mortality risk than their age-and sex-matched peers from the general population.

Table 1: Excess mortality risk in SVD patients compared with the general population

	Patient-years at risk	Observed death	Observed deaths per 1000 person-years	Expected death	Expected deaths per 1000 person-years	Excess rate per 1000 person-years	Standardized mortality rate(95%CI)	p value
Total	5819.5	168	28.9	169.5	29.1	-0.2	1.0 (0.8-1.1)	0.526
Fazekas score								
1	4071.8	78	19.2	94.2	23.1	-3.9	0.8 (0.6-1.1)	0.951
2	1137.3	49	43.1	47.6	41.9	1.2	1.0 (0.8-1.3)	0.382
3	610.5	41	67.2	27.7	45.4	21.8	1.5 (1.1-2.0)	**0.006**
Presence of lacune								
No	4409.2	93	21.1	116.6	26.4	-5.3	0.8 (0.6-1.0)	0.986
Yes	1410.3	75	53.2	52.9	37.5	15.7	1.4 (1.1-1.7)	**0.002**
Presence of microbleed								
No	4919.2	130	26.4	135.1	27.5	-1.1	1.0 (0.8-1.1)	0.649
Yes	900.3	38	42.2	34.4	38.2	4.0	1.1 (0.8-1.5)	0.240
Mean diffusivity#								
Low	3211.6	27	8.4	52.4	16.3	-7.9	0.5 (0.3-0.7)	0.999
High	2567.5	141	54.9	114.9	44.8	10.1	1.2 (1.1-1.4)	**0.008**

Subgroup of mean diffusivity: Low: lower than the median; High: higher than the median.

Disclosure of interest: No

SMALL VESSEL DISEASE

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Increased Blood-Brain Barrier Permeability Colocalizes with Interstitial Free Water in Cerebral Small Vessel Disease White Matter Injury

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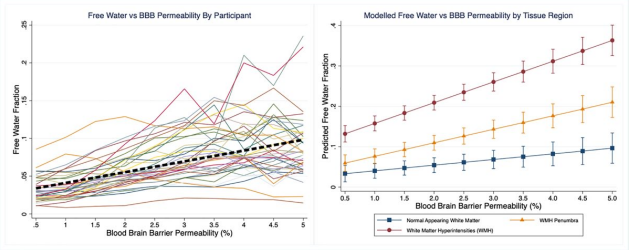
Background and aims: In cerebral small vessel disease (CSVD), diffusion tensor imaging (DTI) quantifies white matter degradation. We hypothesize that increasing blood brain barrier permeability (BBBP), measured with dynamic susceptibility contrast (DSC) MRI, contributes to increased interstitial fluid and white matter injury.
Methods: Participants with a history of stroke ⩾3months prior and evidence of CSVD underwent MRI cross-sectionally with multishell-DTI, FLAIR and DSC. FLAIR white matter hyperintensities (WMH) were segmented and aligned to DTI to classify WMH, WMH penumbra, and normal appearing white matter (NAWM). DTI free water (FW) fraction was used to estimate interstitial fluid while FW-corrected white matter integrity was measured as tissue fractional anisotropy (FA_{Tissue}) and tissue mean diffusivity (MD_{Tissue}). DSC, also aligned to DTI, was used to identify regions of BBBP disruption, grouped into 0.05% intervals from 0-5%. Within each tissue region, mean DTI metrics were calculated within each colocalized BBBP echelon.
Results: For 40 participants (mean age 70 years, 40% female), increasing BBB disruption across all white matter was most strongly associated with increased colocalized FW (Beta=0.015; [0.013–0.017]; $p<0.001$; left figure), moreso than with increased FA_{Tissue}, and not with MD_{Tissue}. Within tissue regions, increasing BBB disruption was most strongly associated with increased FW within WMH (beta=0.042; [0.033-0.051]), followed by increased FW in WMH Penumbra (0.029; [0.023-0.34]), and least within NAWM (0.014; [0.012-0.017]; $p<0.001$; right figure).
Conclusions: Increasing BBB permeability is associated with colocalized increased interstitial fluid, and this association is most pronounced in regions of greatest CSVD white matter injury.



Disclosure of interest: No

SMALL VESSEL DISEASE

1387

Imaging-based risk scores for predicting major bleeding in patients taking antithrombotic therapy: the Bleeding with Antithrombotic Therapy study 2

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Background and aims: To determine whether the features of cerebral small vessel disease (SVD), which is available on rapid visual assessment of clinical MRI, predicts risk of major bleeding in patients taking antithrombotic agents.
Methods: The prospective, multicenter, observational study (BAT2 [Bleeding with Antithrombotic Therapy study 2]) enrolled patients with cerebrovascular or cardiovascular diseases who were taking oral antiplatelets or anticoagulants. Multimodal brain MRI was performed at

baseline under prespecified conditions, which covered the burden of SVD (white matter hyperintensities, cerebral microbleeds, lacunes, enlarged perivascular spaces, cortical superficial siderosis) with central reading. We developed Cox regression analyses models to predict the risks of major bleeding, selecting candidate predictors on clinical relevance and MRI findings using backward elimination. Performance was assessed with the c statistic and calibration plots, adjusted for optimism using bootstrapping.
Results: Major bleeding occurred in 93 of 5250 patients (mean age 71±11 years, 33% women) during median follow-up of 2.0 years. The risk score model included the variables of age of 75 years or older, lacunes (1 to 4, 5 or more), deep cerebral microbleeds (1 to 4, 5 or more), antithrombotic treatment (warfarin, direct oral anticoagulant [DOAC], dual antiplatelet therapy, antiplatelet and warfarin or DOAC). Optimism-adjusted c index was 0.74 (95% CI 0.71–0.79) with a calibration slope of 0.78 (0.49–1.01) for the major bleeding.
Conclusions: Based on readily available SVD features, the BAT2 scores exhibit a predictive value for the risks of major bleeding in patients taking antithrombotic agents

Factor		Score
Age (years)	<75	0
	75≤	2
Deep CMBs	0	0
	1-4	1
	5≤	3
Lacunes	0	0
	1-4	1
	5≤	3
Antithrombotic treatment	antiplatelet	0
	dual antiplatelet therapy	1
	DOAC	1
	warfarin	2
	antiplatelet and warfarin or DOAC	2

Figure. The scores for major bleeding.

Disclosure of interest: No

SMALL VESSEL DISEASE

2488

Subclinical renal malfunction is associated with cerebral small vessel disease (CSVD) in the general population

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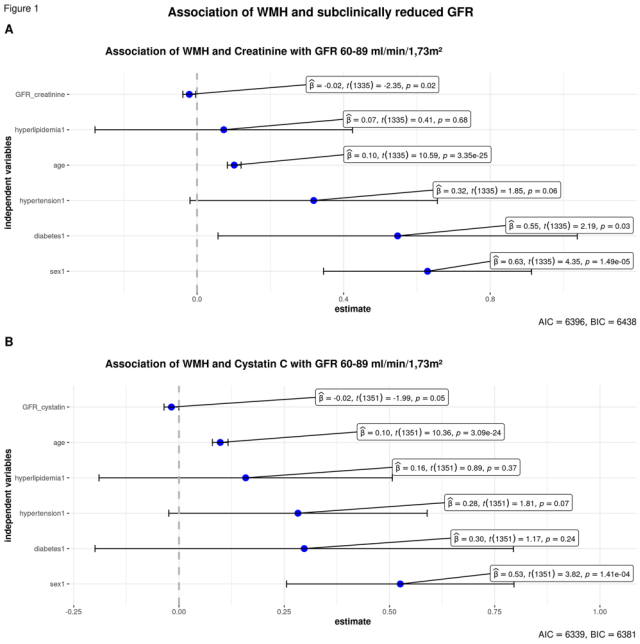
Background and aims: Renal malfunction measured by creatinine based glomerular filtration rate (GFR) is associated with severity of CSVD measured by white matter hyperintensities (WMH). Recent findings showed GFR estimated by cystatin C concentration was associated with cardiovascular outcomes and introduced peak width of skeletonized mean diffusivity (PSMD) as a more precise imaging marker of microstructural brain damage. We evaluated different GFR estimations methods and the association of subclinical changes in GFR with MRI markers of CSVD in a large population-based cohort.
Methods: 2577 participants of the Hamburg City Health Study were included in our analysis. GFR was estimated by creatinine, cystatin C or its combination. CSVD MRI markers included WMH and PSMD. Multivariate linear regression models were adjusted for common confounding variables such as age, sex, hypertension, diabetes and hyperlipidemia.
Results: Assessing subclinical changes in GFR (GFR 60-89ml/min/1.73m^2), multivariate linear regression showed a significant association of higher WMH load and reduced GFR estimated by creatinine ($p = 0.018$ Figure 1A) or by cystatin C ($p = 0.047$, Figure 1B), but not by its combination. We found a similar, although non-significant trend for higher PSMD and reduced GFR estimated by creatinine ($p = 0.076$, not shown).
Conclusions: Renal malfunction estimated by distinct GFRs was associated with WMH but not PSMD as CSVD markers. Creatinine and cystatin C were even sensible for subclinical GFR changes (GFR 60-89ml/min/1.73m^2). By relating renal malfunction to CSVD our findings support the notion of kidney impairment contributing to CSVD in the context of a brain-kidney-axis.



Disclosure of interest: No

SMALL VESSEL DISEASE

2157

PROGRESSION OF CLINICAL OUTCOMES AT 6 AND 12 MONTHS IN CEREBRAL SMALL VESSEL DISEASE STROKE: ANALYSIS OF CONTROLS IN THE LACUNAR INTERVENTION TRIAL-2 (LACI-2)

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Background and aims: Lacunar stroke, a form of cerebral small vessel disease (cSVD), causes dependency and cognitive decline/dementia.

However, there is no specific treatment to prevent adverse outcomes after lacunar stroke/cSVD. The LACunar Intervention Trial-2 (LACI-2, ISRCTN14911850) assessed the feasibility, safety and efficacy of isosorbide mononitrate (ISMN, acts via cGMP) and cilostazol (acts via cAMP) over one year.

Methods: LACI-2 was an investigator-initiated prospective randomised open-label blinded-endpoint 2x2-factorial phase-IIb trial. Adults age>30yrs with clinical lacunar ischaemic stroke, compatible MR/CT brain-imaging and capacity to consent, were randomised to ISMN 25mg bd, cilostazol 100mg bd, both, or neither, for one-year. Outcomes including cognition (7-level cognition scale, Cog-7; telephone-Montreal cognitive assessment, t-MoCA; telephone interview cognitive scale-modified, TICS-M), function (modified Rankin scale, mRS) and mood (Zung depression scale) were assessed at 6- and 12-months. Change over one-year in the double-control cohort were assessed using Kendall's tau for trend.

Results: LACI-2 recruited 363 participants (of 400, 91%) 02/2018-05/2021 from 26 UK-hospitals. In the double-control group (n=91): age 64[57-74] years, females 30 (33%), stroke onset to randomisation 77[17-256] days. Over one-year of follow-up, the composite outcome and mRS worsened; in contrast, cognition and mood improved.

Conclusions: In untreated participants, outcome events increased and function worsened; cognition and mood marginally improved. These outcomes will be targeted in the planned LACI-3 trial.

Days	180	365	Coefficient	p-trend
Composite(%)	69.1	69.6	0.23	0.02
mRS>2(%)	14.7	17.7	0.60	<0.0001
Cog-7(impaired,%)	69.1	64.6	0.21	0.09
tMoCA(/22)	18.1	18.0	0.53	<0.0001
TICS-M(/39)	25.5	26.5	0.51	<0.0001
Zung(/102.5)	54.2	53.2	0.58	<0.0001

Disclosure of interest: No

SMALL VESSEL DISEASE

1623

Associations of risk scores with SVD burden and progression in elderly patients on oral anticoagulants for atrial fibrillation: the Strat-AF Study

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Background and aims: Guidelines recommend CHA2DS2-VASc and HAS-BLED scores, based on clinical variables, for thromboembolic and hemorrhagic risk in atrial fibrillation (AF), however, their predictive value is limited. MICON-ICH and MICON-IS, including the imaging variable microbleeds (MBs), have been recently proposed in patients on antithrombotics. In a cohort of elderly AF patients on oral anticoagulants we assessed the associations between MICON, CHA2DS2-VASc and HAS-BLED scores and small vessel disease (SVD) markers (baseline and progression).

Methods: Strat-AF study is an observational, prospective, single-center study that enrolled patients over 65 years, taking oral anticoagulants for AF. Brain MRI was performed at baseline and after 18 months. On MRI, SVD burden and progression were visually assessed with validated scales. Risk scores were calculated at baseline.

Results: 170 patients were enrolled (mean age:77.7+/-6.8 years, male:65%). At baseline, MICON-ICH was associated with all SVD markers and MICON-IS with all but Centrum SemiOvale-Enlarged PeriVascular Spaces, while CHA2DS2-VASc and HAS-BLED showed few associations (Table 1A). At follow-up, only incident MBs were associated with MICON-ICH and MICON-IS, while no associations were found for CHA2DS2-VASc and HAS-BLED (Table 1B). Lobar MBs were more correlated with MICON-ICH, while deep MB with MICON-IS (Figure 1A-B).

Conclusions: Compared to CHA2DS2-VASc and HAS-BLED, MICON-scores were more consistently associated with the presence of SVD markers and with incidence of new MBs. MBs location might increase the predictive ability of the MICON-scores.

Table 1A-B. Associations between risk scores and baseline and progression SVD markers

		MICON-ICH		MICON-IS		CHA_2DS_2-VASc		HAS-BLED	
		score	p	score	p	score	p	score	p
White Matter Hyperintensities (WMHs)	≥19	**6.8±2.5**	**.001**	**8.3±2.6**	**.034**	3.8±1.3	.341	**2.0±1.0**	**.034**
Scheltens scale (75° percentile cut off)	0-19	**5.8±2.2**		**7.6±2.1**		3.7±1.6		**1.7±0.8**	
MicroBleeds (MBs)	≥1	**9.4±2.0**	**.001**	**9.6±2.2**	**.001**	**4.2±1.2**	**.034**	1.9±0.9	.250
prevalence	0	**5.3±1.7**		**7.4±2.0**		**3.6±1.5**		1.7±0.8	
Lacunes	≥1	**6.6±2.4**	**.032**	**8.8±3.0**	**.006**	4.0±1.5	.096	**2.0±1.0**	**.010**
prevalence	0	**5.9±2.3**		**7.4±1.9**		3.7±1.5		**1.7±0.8**	
Basal Ganglia-Enlarged PeriVascular Spaces (BG-EPVS)	≥2	**6.5±2.4**	**.001**	**8.0±2.3**	**.012**	3.8±1.5	.280	1.8±0.9	.246
rating	0-1	**5.4±2.0**		**7.3±1.9**		3.7±1.5		1.7±0.8	
Centrum SemiOvale-EPVS (CSO-EPVS)	≥2	**6.5±2.6**	**.015**	8.0±2.1	.092	3.8±1.5	.199	1.8±0.9	.190
rating	0-1	**5.7±2.0**		7.5±2.2		3.6±1.5		1.7±0.8	

		MICON-ICH		MICON-IS		CHA_2DS_2-VASc		HAS-BLED	
		score	p	score	p	score	p	score	p
WMHs progression	≥2	6.4±1.7	.182	8.6±2.4	.061	4.0±1.1	.257	2.2±1.0	.056
Rotterdam scale (75° percentile cut off)	0-1	5.9±2.6		7.6±2.4		3.6±1.6		1.8±0.8	
New MBs	≥1	**7.3±3.0**	**.030**	**8.7±1.9**	**.046**	3.8±1.1	.704	2.0±0.9	.444
incidence	0	**5.7±2.3**		**7.6±2.4**		3.7±1.6		1.8±0.9	
New Lacunes	≥1	5.5±2.0	.943	8.0±3.0	.634	2.8±1.5	.172	2.0±0.9	.559
incidence	0	5.9±2.5		7.7±2.4		3.7±1.5		1.8±0.9	
Increased rating of BG-EPVS	≥1	5.5±2.0	.516	7.5±2.5	.394	3.5±1.8	.409	1.9±1.0	.829
rating follow up-rating baseline	0	6.1±2.5		7.8±2.3		3.7±1.5		1.8±0.9	
Increased rating of CSO-EPVS	≥1	6.2±1.8	.494	8.5±2.6	.211	4.2±1.8	.414	1.8±0.9	.777
rating follow up-rating baseline	0	5.8±2.6		7.5±2.4		3.6±1.5		1.8±0.9	

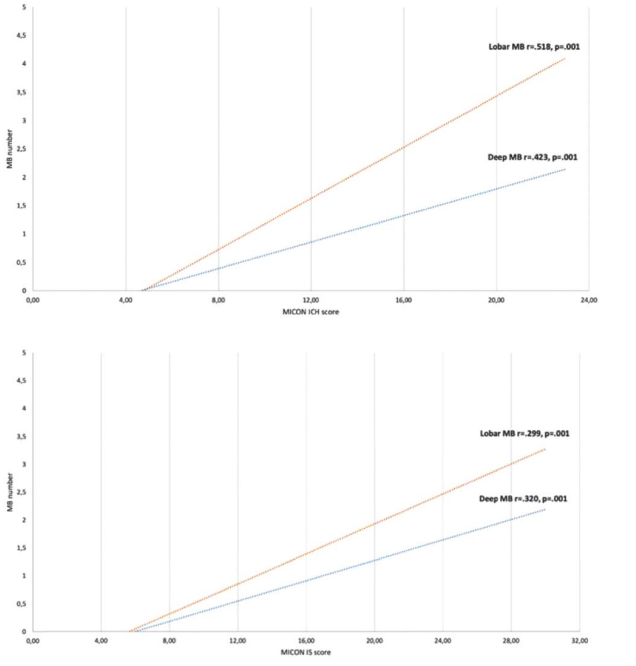

Figure 1A-B. Correlation between MICON-scores with lobar and deep MBs

Disclosure of interest: No

SMALL VESSEL DISEASE

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A Simple Clinical Score for Screening of Suspected Acute Lacunar Stroke

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Background and aims: Lacunar stroke represents around a quarter of all ischemic strokes, however, their identification in the acute setting is challenging. We aimed to validate a simple clinical score to identify lacunar stroke in the acute setting with magnetic resonance (MR) data.
Methods: We analysed data from the WAKE-UP trial and extracted Oxfordshire Community Stroke Project (OCSP) classification. Lacunar clinical score was defined as patients having NIHSS$<$7 and OCSP lacunar syndrome. Assessment of acute lacunar infarcts on MR was made by two independent investigators blinded to clinical data. We calculated sensitivity, specificity, negative and positive predictive value (NPV and PPV, respectively) of lacunar score.
Results: We included 503 patients, mean ($\pm$SD) age 65.2 ($\pm$11.6), 325 (65%) males, median (IQR) NIHSS=6 (4-9); 108 (22%) lacunar infarcts were identified on MRI, patients fulfilling lacunar score criteria were 120 (24%). Patients with lacunar score had lower NIHSS (4 vs 7, p$<$0.001), higher systolic (157 mmHg vs 151 mmHg,p=0.001) and diastolic (86 mmHg vs 83 mmHg,p=0.013) blood pressure and smaller infarct volume (2.4 ml vs 9.5 ml,p$<$0.001). Performance of lacunar score was: sensitivity 0.44; specificity 0.82; PPV 0.39; NPV 0.84; accuracy 0.73. False negatives (N=61) had higher systolic blood pressure (158 mmHg vs 151 mmHg,p=0.015) and smaller stroke volume (0.78 ml vs 8.91 ml,p$<$0.001), false positives (N=73) had smaller stroke volume (3.54 ml vs 8.59,p=0.004).
Conclusions: Implementation of this simple score into clinical practice may help acute management of lacunar stroke and guide patient selection in clinical trials with good specificity.
Disclosure of interest: No

SEX, GENDER AND STROKE

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Stroke neurologists as lecturers in Neurology in Spanish medical schools: rates and gender gaps among academia

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Background and aims: Gender disparities are well-known in universities and affect different countries in Europe. For women, it is harder to reach the highest academic ranks than for their male colleagues. Female stroke neurologists represent 51-60% of Spanish members of the European Stroke Organization (ESO). We aim to identify their performance in academia and a possible gender gap in this field.
Methods: We integrated available information in public databases of all the Spanish medical schools for the academic year 2022-23, considering the number of neurologists dedicated to teaching, their academic rank and gender. Special dedication in the area of neurovascular disorders, if not noted by the university, was assessed by reviewing research production.
Results: Of the 50 complete medical degree curricula, we could not gather enough data from six schools opened in the last years. In all the others, 166 neurologists were involved as lecturers in Neurology (33.7% women). They coordinated the subject in 32 faculties (eight of them being stroke neurologists, 37.5% women). Academic ranks among stroke neurologists were as follows: two professors (none women), nine senior lecturers (one woman), one lecturer (woman), and 19 associate lecturers (11 women).
Conclusions: Gender disparity among Spanish academic staff is also a reality in our field. Considering female rates memberships in ESO, their involvement in university teaching and ranks are below expected. We should address these differences in order to reduce inequalities. Situations from other European countries would be of interest.
Disclosure of interest: No

SEX, GENDER AND STROKE

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ARE THERE SEX DIFFERENCES IN THE SEVERITY OF CARDIOEMBOLIC STROKE DUE TO ATRIAL FIBRILLATION?

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Background and aims: Previous studies have described a higher risk of cardioembolic (CE) stroke in women, which were more severe and showed worse functional outcomes. This could be explained by a lower dose of anticoagulants given to females. Our aim is to describe the gender-related severity of the CE stroke due to AF (atrial fibrillation).
Methods: We conducted a retrospective study of a prospective collected database at a regional level in the Comunidad Valenciana from July to December 2021.
Results: A total of 1992 cases were registered, 551 of which were ischemic stroke. Among those, 212 (38.6%) were females and 110 were AF related CE, whereas in our database CE caused by AF amongst women

in 50 cases (45.5%). 60 patients presented AF previously and 40 were receiving anticoagulation at admission, 20/50 (40%) women and 20/60 (33,3%) men.
Presenting NIHSS was higher in women, but this difference was not statistically significant (10 vs 9, p = 0,236). When we considered only CE stroke due to AF, women presented stroke at older age (81 vs 77, p = 0,052) and there were no differences in median presenting NIHSS according to sex (15 vs 15, p = 0,799). The mortality rate at 3 months was of 19,1% in men and of 16,2% in women (p = 0,781).
Conclusions: In our series, women with AF related CE stroke did not present with more severe strokes. We hypothesize this finding could be related to a higher proportion of previously anticoagulated patients in women.
Disclosure of interest: No

SEX, GENDER AND STROKE

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The role of age in sex-related differences in efficacy and safety of treatment with direct oral anticoagulants in patients with atrial fibrillation

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Background and aims: Direct oral anticoagulants (DOACs) in thromboprophylaxis of atrial fibrillation (AF) are increasingly used. The proportion of women included in RCTs on DOACs is low leading to conflicting evidence, particularly in women aged >75 y.
Methods: A systematic review and meta-analysis were performed using 4 databases from 1990 to 2020. Studies (st) on efficacy and safety of DOACs were compared between the sexes of all ages and/or those aged >75 y.
Results: From 2,679 art.,(161 full-text screened), 32 (10 RCTs, 22 observational st) were included. Women had lower rates of long-term mortality (2 y) compared to men (27,213 pat.; 6.5% vs. 7.7%, OR 0.84; [0.76- 0.92], I^2=0, *P*=0.0004). Conversely, rates of all stroke, ischaemic stroke or systemic embolism (SE) were higher in women (16 st, 236,989 pat.) (1.1 % vs. 0.9%, OR 1.18, [1.08- 1.30], I^2=18%, *P*=0.0006). Rates of intracranial bleedings did not differ. In pat. aged >75 y (7 st, 72,582 pat.), rates of mortality, stroke, SE, and intracranial bleeding were similar (3 st, 89,538 pat.) (2.3% vs 1.4%, OR 1.36 [1.23-1.51], I^2=0%, *P*<0.00001). GI bleeding occurred more frequently in women in the whole cohort and > 75 y.
Conclusions: In our meta-analysis, compared with men, women with AF treated with DOACs had a higher thromboembolic risk than men and a lower long-term mortality. Conversely, women and men aged >75 years had similar rates of mortality, thromboembolic events and intracranial bleeding. More studies are needed to better understand whether older age can nullify the observed sex differences.
Disclosure of interest: No

SEX, GENDER AND STROKE

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SEX PATTERNS IN TIA AND STROKE SYMPTOMS IN LIGHT OF THE FACE ARM SPEECH (FAST) PUBLIC EDUCATION CAMPAIGN: THE POPULATION-BASED ROTTERDAM STUDY

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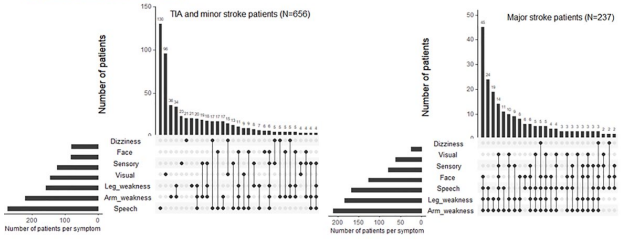
Background and aims: Urgent medical treatment is crucial after stroke and TIA, but hindered by extensive prehospital delays. Public education campaigns based on the FAST-test (Face-Arm-Speech-Time) have improved response after major stroke, but not minor stroke and TIA, due potentially to lower sensitivity of the FAST test to minor events. We aimed to determine frequency of TIA and stroke symptoms in the general population.
Methods: We included all patients with first-ever stroke or TIA from 2002-2016 in the population-based Rotterdam Study. We scrutinized medical records from all healthcare providers for neurological symptoms, and determined the prevalence of different symptoms by stroke severity (i.e., TIA, minor stroke[NIHSS⩽3], and major stroke[NIHSS>3]). We also assessed sensitivity of the FAST-test for event diagnosis.
Results: Of all 896 patients (mean age: 77.6(±9.4) years, 57.2% women), 237 had major stroke, 254 minor stroke and 407 TIA. Virtually all patients with major stroke experienced ⩾1 FAST-symptoms (233/237;98.3%), while ⩾1 symptom was present in 250 (62.2%) patients with TIA and 186 (73.2%) with minor stroke. FAST-symptoms were similar in men and women. Among patients with no FAST-symptoms, hemianopia (46.7% TIA and 33.8% minor stroke), sensory disturbance (13.8% TIA and 27.9% minor stroke), and dizziness (17.1% TIA and 25.0%minor stroke) were common.
Conclusions: In contrast to major stroke, the FAST-test has limited sensitivity for TIA and minor stroke, missing one third of events. Future public education campaigns on stroke awareness may benefit from focus on less severe or transient events, notably by involving visual defects.

Figure 1. Combination of focal neurological symptoms among all patients with first-ever TIA, minor and major stroke in the population-based Rotterdam Study



Disclosure of interest: No

SEX, GENDER AND STROKE

1093

Service delivery for acute ischemic stroke patients: Does sex matter?

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Background and aims: There is mounting evidence that women with acute ischemic stroke (AIS) are older, and have higher preexisting handicap and comorbidities than men. These factors only partially explains their poorer functional long-term outcome, however. We therefore sought to investigate sex differences in the delivery of acute stroke services in a large cohort of consecutive AIS patients.
Methods: All patients from the Acute STroke Registry and Analysis of Lausanne (ASTRAL) from 03/2003-12/2019 were analysed. Multivariate analysis of acute time metrics, revascularization therapies (IVT/EVT), number of ancillary exams for stroke work-up, subacute carotid artery revascularization for symptomatic stenosis, rate of change in goals of care (palliative care attitude) and lengths of hospital stay were performed
Results: Of the 5347 retrospectively analyzed patients, 45% were female and the median age was 74.6 years. Female sex was significantly associated with higher onset-to-door (OR:1.09, 95%CI 1.04-1.14;$p<0.01$) and door-to-puncture intervals (OR:1.15, 95%CI 1.05-1.25;$p<0.01$). There were also trends for less diagnostic exams in women (OR:0.92 95%CI 0.83-1.01; p=0.08), fewer subacute carotid revascularisation treatments (OR:0.69 95%CI0.33-1.18; p=0.147) and longer hospital duration (OR:1.03 95%CI 0.99-1.07;p=0.19). We found no significant differences in the rates of IVT and/or EVT, nor changes in goals of treatments between male and female sex.
Conclusions: In this consecutive, retrospective, single-center analysis of a large AIS cohort, female sex was significantly associated with longer onset-to-door and door-to-endovascular puncture times. These and other indicators for less effective stroke service delivery may explain the poorer functional long-term outcomes in female patients and requires further attention.
Disclosure of interest: No

SEX, GENDER AND STROKE

1604

Sex differences in stroke care: A national stroke registry study

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Background and aims: Previous studies showed differences between men and women in stroke care. We aim to evaluate the quality of care by gender and assess outcomes at discharge.
Methods: Ten key indicators, representative from across stroke care pathway, were analysed using the national quality register for England, Wales and Northern Ireland (2016-2022, n=810436). Logistic regression models were constructed adjusted for demographics and case mix. Good outcomes were measured using modified Rankin scale (mRS 0-2).
Results: 48% of the study population were women, mean age 77 (SD: 13.4) compared to 72 (13.3) for males. Compared to men, women tend to have severe strokes (19% vs 12%), more diabetes (19% vs 24%), more AF (21% vs 18%) and similar stroke types (Ischemic: 87% vs 88%). Differences were identified for access to brain scanning within 1 hour (Adjusted Odds Ratio 1.07, Confidence Interval 1.06-1.08), whether patient attended a stroke unit within 4hrs (AOR 1.04, 1.03-1.05), receiving thrombolysis within 4hrs (AOR 1.11, CI 1.09-1.13), swallow screening within 4hrs (AOR 0.92, CI 0.91-0.93), assessed by occupational therapist within 72hrs (AOR 0.95, CI 0.94-0.97), physiotherapy within 72hrs (AOR 1, CI 0.99-1.01) and speech and language therapist within 72hrs (AOR 0.94, CI 0.93-0.95). At discharge, men have higher likelihood of good outcomes (AOR 1.13, CI 1.11-1.14) but worst mortality (AOR 1.14, CI 1.13-1.16).
Conclusions: Differences were observed in acute stroke care between men and women. At discharge, Female patients with stroke tended to have better survival but poorer outcomes compared to men.
Disclosure of interest: No

SEX, GENDER AND STROKE

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Sex and thrombin generation differences associated with leukocyte gene expression in patients with acute ischemic stroke

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Background and aims: Sex differences in stroke exist including variation in stroke risk and outcome. In this study, we examine leukocyte gene expression differences by sex and thrombin generation in patients with ischemic stroke. Sex related differences in thrombus generation may contribute to differences in stroke risk or outcome, requiring sex specific prevention strategies.
Methods: In 97 patients with acute ischemic stroke, thrombin generation was measured by in-vitro assay. Leukocyte gene expression was measured by microarray. Differences in leukocyte gene expression related to sex and thrombin generation were identified. Identified genes were also analysed by functional analysis.
Results: Females and males had similar overall level and distribution of thrombin generation. An increase in thrombin generation in females was associated with increased thrombin signaling (*CCR1, PAR2, F13A1*), and platelet activation and aggregation (*SELP, GP1BA, GP1BB, GP5, ESAM, MPL*), while males with high peak thrombin have decreased expression of genes involved in thrombus degradation (*SERPINE2, SERPING1*). Pathways identified by functional analysis identified estrogen-mediated S-phase entry, granulocyte adhesion and diapedesis and IL-1 signaling.
Conclusions: Sex and thrombin generation differences related to gene expression exist in patients with acute ischemic stroke. We identified several novel genes and pathways that are differentially expressed between females and males with high and low peak thrombin. These genes provide insight into regulatory differences of thrombus generation between females and males and may have implications for sex specific stroke treatment strategies.
Disclosure of interest: No

SEX, GENDER AND STROKE

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GENDER DIFFERENCES IN PSYCHOLOGICAL SEQUELAE OF DYSPHAGIA AFTER ISCHEMIC STROKE

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Background and aims: This study examines the relationship between gender and dysphagia after ischemic stroke, including psychological consequences.
Methods: Within the STROKE-CARD Registry study (NCT04582825) from 2020 to 2022 dysphagia was diagnosed within clinical routine by standard swallowing examinations by speech therapists. SINGER Independency Index assessed swallowing issues at discharge and after 3 months. Affective symptoms were recorded after 3 months based on Hospital Anxiety (HADS-A) and Depression (HADS-D) Scale and Beck Depression Inventory (BDI).
Results: Of 648 patients, including 36.6% women and 63.4% men, 19.3% had dysphagia at baseline. At hospital discharge and 3-month follow-up, 13.5% and 6.8% reported ongoing swallowing issues, respectively. The longer the swallowing problem persisted, the higher were the scores in HADS-A, HADS-D, and BDI. In linear regression analysis adjusting for age, sex and functional disability at 3 months HADS-D ($p = < 0.001$) and BDI ($p = 0.007$), but not HADS-A ($p = 0.090$) scores at 3 months were significantly higher in patients with persistent dysphagia compared to those without initial dysphagia or who recovered until follow-up. There was no difference in mean scores between the sexes on HADS-A, HADS-D and BDI, however, men had a higher incidence of reporting being irritable more quickly (66.7% vs. 27.8%; $p = 0.009$). In addition, women were significantly more likely to receive antidepressants after 3 months (64.5% vs. 40.4%; $p = 0.030$).
Conclusions: Post-stroke dysphagia has impact on depressive symptoms 3 months after ischemic stroke with poor gender-specific differences.
Disclosure of interest: No

SEX, GENDER AND STROKE

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SEX DIFFERENCES IN STROKE CARE AND OUTCOMES – A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and aims: Studies on sex differences in stroke processes of care and outcomes have increased rapidly in recent years. We aim to provide an up-to-date systematic review and meta-analysis.
Methods: Relevant studies published from January 2008 to May 2022 were searched in MEDLINE, Embase and CINAHL. Random-effect models were used to calculate pooled estimates, Hazard Ratios and Odd Ratios, where applicable. I^2 was used to measure heterogeneity. Funnel plots and Egger test were used to evaluate publication bias.
Results: Of 101 studies included in our narrative review, 50 were eligible for the meta-analysis. The overall pooled estimate showed that women were 13% [3%-22%] less likely to receive thrombolysis after stroke compared to men. Women had increased risk of poor functional outcomes:32 % [21%-44%]. Moreover, women had 14% (95% CI, [7%-20%]) lower risk of all-cause mortality; however, these discrepancies were only observed in studies with follow-up over 5 years. No significant differences were found in case-fatality or recurrence. Our narrative review suggested that women were more likely to be depressed after stroke, but no difference in cognitive impairment. Heterogeneity of over 50% between studies was observed.
Conclusions: Female stroke patients tend to have better survival, but poorer functional outcomes and to access to stroke care than male patients. Our findings highlight the opportunities to improve post-stroke healthcare services and secondary prevention in women.
Disclosure of interest: No

SEX, GENDER AND STROKE

2039

Gender difference in stroke prophylaxis

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Background and aims: Atrial fibrillation (AF) is an important stroke risk factor. Women might face a disproportionately high stroke burden, requiring efforts to understand gender-specific underlying causes. Data on prophylactic anticoagulation in patients with AF and stroke suggests that women may be undertreated.
Methods: From 2009 to 2022, we prospectively registered all acute stroke patients treated with endovascular thrombectomy (EVT). We recorded stroke-risk factors, including AF and status of anticoagulation. In order to examine a possible gender difference in treatment, we compared proportions of men and women diagnosed with AF and proportions sufficiently anticoagulated.
Results: 438 patients were treated with EVT. In 86 men (35%) and 85 women (45%) AF was detected (p=0.04). In 41 men (17%) AF was newly diagnosed. In 47 men (19%) AF was known at admission, in 23 men (9%) AF was insufficiently anticoagulated. In 39 women (20%) AF was newly diagnosed and 76 (40%) had known AF. 37 women (19%) were insufficiently anticoagulated at admission (p=0.002). Clinical outcome, treatment times in hospital and rate of complications did not differ between the groups.
Conclusions: In this prospectively followed group of patients treated with EVT, significantly more women were diagnosed with AF. In addition, significantly more women with known AF were insufficiently anticoagulated compared to men. This may indicate that women are more likely to be undertreated for AF and thus might have a higher risk for related stroke. We suggest further studies addressing specific causes and potential improvements in prophylactic treatment of AF in women.
Disclosure of interest: No

SEX, GENDER AND STROKE

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Sex-related differences in pre-hospital and hospital treatment of patients with suspicion of acute ischemic stroke

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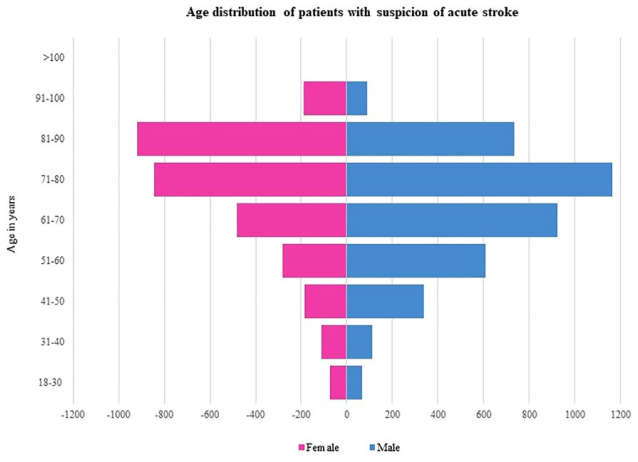
Background and aims: We analyzed sex-specific differences in stroke patient admission and treatment in order to reveal potential gaps in stroke care.
Methods: We screened all patients referred to our stroke center between 2014 and 2020 with suspicion of stroke. Patients with different cerebrovascular events and stroke mimics were included. We collected demographic, hospitalization and 90-day-follow-up-data and stratified results according to sex. In a logistic-regression analysis for 90-day-functional-outcome, we estimated the effect of sex and corrected for age, admission-NIHSS, atrial fibrillation, arterial hypertension and diabetes.
Results: Of 7103 patients included, 56.7% were male and 43.3% female. Women were older (median 76.3 years, IQR 64-84, vs. 70.7, IQR 59-79, $p<0.001$, Figure1), and lived more often in nursing homes before the event (10.5% vs. 3.8%, $p<0.001$). Among patients with acute ischemic stroke, endovascular treatment was performed more often in women (21.4% vs. 17.3%, $p<0.01$). Onset-to-treatment and door-to-treatment-times were significantly longer in women, who presented with a higher stroke severity (NIHSS 4, IQR 1-12, vs. 3, IQR 1-8). A favorable 90-day-functional-outcome (mRS 0-2) occurred more often in men (72.8% vs. 62.4%, $p<0.001$). When correcting for confounders in a multivariable logistic-regression, female sex was independently associated with 3-months-outcome ($p<0.05$) with age, admission-NIHSS and diabetes remaining highly significant predictors ($p<0.001$).
Conclusions: Although treatment and outcome parameters appear to be in favor of men, most can be explained by older age and higher stroke severity in women. However, with considerably fewer women admitted to specialized stroke center care, their chances for recovery may be further diminished.



Disclosure of interest: No

SEX, GENDER AND STROKE

2219

Sex differences in stroke management: the real-life experience in Genoa (Italy)

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Background and aims: Stroke prevalence in women is rising with the increase of female population average age. We have conducted an observational study in our city, Genoa (Italy), aimed at assessing sex differences in stroke management.
Methods: Data were collected in the three main city hospitals, from June 2021 to June 2022. 845 patients with ischemic and hemorrhagic stroke, admitted to hospital within 24 hours after symptoms onset, were enrolled.
Results: Significant gender-related differences in demographics and clinical severity at hospital admission were reported (Tab.1). We did not observe any difference in onset-to-door time, door-to-imaging time, door-to-needle time, and door-to-groin time (Tab.2). Among patients with ischemic stroke, 301/749 were treated with intravenous (IV) thrombolysis. We observed that women were more likely to be treated with IV thrombolysis than men (OR=0.7,95%CI=0.5–0.9, p=0.03). A significant correlation between female sex and the worst clinical outcome was reported; no differences in mortality were observed (Tab.3).
Conclusions: Data regarding the older age and the more severe stroke presentation in women have already been confirmed in several studies. In our peculiar cohort of patients, among the oldest in Europe, both the physiological aging process and psychosocial risk factors (e.g. social isolation) may have contributed to increase stroke incidence and its clinical severity among women. Even if more women were treated with IV

Tab.1

	Total	Male	Female	P
Absolute number	845 (100%)	397 (47%)	448 (53%)	
Mean age	77.7 ± 13.15	74.2 ± 13.55	80.8 ± 11.96	< 0,001
Age (min-max)	16.5 - 102.0	16.5 - 100.4	34.4 - 102.0	
NHISS (admission)	8.1 ± 6.1	9.3 ± 6.4	10.3 ± 6.5	< 0,001

Tab.2

	Total	Male	Female	P
Onset to Door (min.)	201.0 ± 236.6	196.0 ± 231.5	205.6 ± 241.4	0.60
Door to Imaging (min.)	75.9 ± 81.8	81.4 ± 91.0	70.8 ± 73.2	0.13
Door to Needle (min.)	133.3 ± 202.9	143.3 ± 234.3	121.9 ± 175.6	0.31
Door to Groin (min.)	245.4 ± 297.1	234.3 ± 310.7	259.9 ±290.6	0.75

Tab.3 Modified Rankin Scale (mRS) at discharge

mRS	Total	Male	Female	p
0	48 (7,2%)	34 (10,8%)	14 (4%)	<0,001
1	75 (11,3%)	41 (13,0%)	34 (9,8%)	
2	77 (11,6%)	38 (12,0%)	39 (11,2%)	
3	95 (14,3%)	57 (18,0%)	38 (10,9)	
4	152 (22,9%)	62 (19,6%)	90 (25,9%)	
5	94 (14,2)	30 (9,5%)	64 (18,4%)	
6	123 (18,5%)	54 (17,1%)	69 (19,8%)	0,9

thrombolysis, final clinical disability was worse in women. This result may be explained by the higher severity of symptoms in women at stroke onset.
Disclosure of interest: No

SEX, GENDER AND STROKE

2319

A gender perspective in a drip-and-ship model for mechanical thrombectomy

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Background and aims: Several studies show gender disparities in stroke outcome: women face more mortality and worse disability degrees after strokes. Although there are multiple hypothesis about this, we did not find in literature any time to treatment analysis once the patient arrives at the hospital. Our goal was to find any difference due to gender in our drip-and-ship code stroke model in order to optimize and improve it
Methods: We statistically analyzed mechanical thrombectomies performed between 2014 and 2020 in our center.
Results: There were 322 thrombectomies, of which 160 were women. Women were statistically younger (71.30 vs 78.9 $p<0.001$). Pre-stroke Rankin Scale and pre-treatment NIHSS and ASPECTS show no statistically differences. In our series there are no differences between gender in mortality neither Rankin Scale 3 months after the event. We did not find any statistically difference in the time between clinical onset and arrival at the hospital (74.5 minutes median in women vs 69 minutes in men – p 0.49). Neither we find in door-to-needle time (54 minutes median in women vs 58 minutes in men - p 0.82) and door-to-puncture time (123 minutes median in women vs 128 minutes in men - p 0.29).
Conclusions: We found no time to treatment neither mortality differences between gender in our mechanical thrombectomy model for strokes. However, we highlight statistically significant differences in age. We need further studies to explain why in our series, women who undergo thrombectomy are younger than men.
Disclosure of interest: No

SEX, GENDER AND STROKE

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GENDER DIFFERENCES IN ISCHEMIC STROKE CARE: A PRELIMINARY ANALYSIS OF DATA FROM TWO STROKE UNITS

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Background and aims: in recent years, gender differences in cerebrovascular disease have been increasingly recognized, however, gender-based stroke medicine is still understudied. We investigated the issue using data our two Stroke Units, located in distinct Italian regions.
Methods: We retrieved data from patients hospitalized for ischemic stroke in our two Stroke Units and analyzed possible differences by sex in age, stroke mimic, admission NIHSS, stroke subtypes defined according to OCSP classification, acute stroke treatments, length of hospitalization, and functional outcomes at 3 months. We used the t-test and, when necessary, the Mann Whitney test for continuous variables, the chi-square test for categorical variables, and the odds ratio for binary variables.
Results: we collected 326 available records, 174 male (1) and 152 female (2), 53,4 and 46,6 % respectively. Median age was significantly higher in women: 79 vs 75, p 0,001. Stroke mimics were more frequent in women, even though only marginally significantly (9% vs 3%, p 0,055, OR 2,8 IC 1,6-7,5). No significant differences were found in all other comparisons, as shown in the table below.
Conclusions: in our real-world stroke units, no gender differences were found in various parameters of care. We hypothesize that these results may depend on our policy of admitting all ischemic stroke patients, both male and female, regardless of age or symptom severity. Our patient population then receives the same type of care, achieving a similar functional outcome at three months.
Disclosure of interest: No

SEX, GENDER AND STROKE

1846

Sex Differences in Functional Outcome after Endovascular Treatment in Patients with Acute Ischemic Stroke

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Background and aims: Endovascular treatment (EVT) for acute ischemic stroke due to large vessel occlusion effectively reduces disability, but data on sex differences in functional outcome of patients treated with EVT are inconclusive. The aim of this analysis is to investigate sex differences in functional outcome after EVT in a nationwide registry.
Methods: Descriptive analyses and multivariable logistic regression models adjusted for prespecified confounders (demographics, patient-specific and clinical parameters) were performed based on data from the Austrian Stroke Unit Registry from 2013-2019. The primary outcome parameter was favorable functional outcome (modified Rankin Scale (mRS) 0-2) three months after the index event.
Results: The study population comprised 2961 patients, of those, 1561 (52.7%) were male and 1400 (47.3%) female. In total, 1236/2961 patients (41.7%) achieved favorable functional outcome. Among male 703/1561(45.0%) achieved an mRS 0-2 compared to female (533/1400 (38.1%)). Over time, a positive trend towards an increase in the frequency of favorable outcome could be observed exclusively in the male population. In the adjusted logistic regression model, we observed a significantly negative association of female sex with favorable functional outcome (adjOR 0.80, 95% CI 0.66-0.96).
Conclusions: In this nationwide cohort of patients with acute ischemic stroke treated with EVT the female patients achieved worse functional outcome. In contrast to other large registry studies, female sex was a

negative predictor of functional outcome despite adjustment for confounding factors.
Disclosure of interest: No

SEX, GENDER AND STROKE

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SEX DIFFERENCES IN STROKE SEVERITY AND RISK FACTORS IN NeST REGISTRY – A REAL-WORLD EVIDENCE

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Background and aims: Several studies have reported disparities in stroke symptomatology between men and women which can lead to misdiagnosis and undertreatment. There are discrepancies between individual studies, reviews and meta-analysis which may be explained by the limited number of patients, population characteristic and various sources of potential biases. Higher-quality prospective studies are needed to support these findings. We investigated whether there were sex differences in clinical presentation and risk factors of stroke in the real-world data of NeuroAiD Safe Treatment Registry (NeST Registy).
Methods: The analysis included Stroke patients receiving MLC601/MLC901 recruited from April 2014 to December 2022 in NeST Registry, a prospective real-world observational registry. Follow-up visits were done at 1, 2 and 3 months. Data collected include demographics, medical conditions, clinical assessments of neurological, functional and cognitive state. Two-tailed t test (SAS software) was performed to determine significant difference in the population of men and women.
Results: Among 540 patients (457 ischemic and 83 hemorrhagic), there were 58 % men (mean age 59 years; SD,14) and women 42 % (mean age 60 years; SD,15.5).There were no significant difference on NIHSS and Modified Rankin Scale across all timepoints. No significant difference in stroke severity between ischemic and hemorrhagic strokes. The usual cardiovascular risk factors were present in both groups.
Conclusions: Stroke patients over 3 months did not show differences related to sex for the effects of MLC601/MLC901 on post-stroke recovery and concomitant risk factors.
This study is submitted on behalf of the NeST Collaborators.
Disclosure of interest: No

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SEX DISPARITIES IN INTRACEREBRAL HAEMORRHAGES – ANALYSIS OF TICH 2 TRIAL DATA

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Background and aims: Disability and prognosis after stroke has been shown to be worse in women. However there is limited data exploring sex differences in patients with intracerebral haemorrhage (ICH). We disaggregated sex data from the TICH-2 trial to investigate the disparities in baseline characteristics, functional outcome (modified Rankin Score [mRS]) and mortality by day 7 and 90.
Methods: TICH-2, a double-blind placebo-controlled trial, investigated the safety and efficacy of tranexamic acid in ICH. Outcome analyses, using logistic regression, were adjusted for age, pre-morbid mRS, systolic blood pressure, National Institute of Health Stroke Scale (NIHSS), ICH-volume and time from onset to randomisation.
Results: 1301 men and 1024 women were recruited to the trial. At baseline, female patients were older, had higher pre-morbid mRS, NIHSS, had larger bleeds, in a lobar territory and were more likely to have a do not resuscitate (DNR) in place(table 1). Analysis of outcomes showed no evidence of a difference between sexes in day 90 mRS (aOR 0.90, 95% CI 0.81-1.20) or mortality by day 7 or 90 (aORs 1.13, 95% CI 0.81-1.56, 1.25, 95% CI 0.96-1.61 Death at day 7 add).
Conclusions: Although women have worse prognostic factors in ICH compared to men, their outcomes did not differ.

Table 1.

Baseline features	Male	Female	P-value
Age(years)	66.2(13.5)	72.3(13.5)	<0.001
Pre-stroke mRS	0.43(0.91)	0.71(1.13)	<0.001
NIHSS	12.6(7.3)	13.6(7.7)	0.002
DNR(%)	161(12.4)	231(22.6)	<0.001
Haematoma location(%)			<0.001
Deep	1) 848(65.2)	523(51.1)	
Lobar	2) 337(25.9)	401(39.2)	
Infratentorial	3) 77(5.9)	72(7.0)	
Combination	4) 39(3.0)	28(2.7)	
ICH volume(ml)	22.7(26.0)	25.6(28.5)	0.012

Disclosure of interest: Yes

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Ischemic stroke induces Endothelial-to-Mesenchymal Transition in brain vessels

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Background and aims: Progressing cerebral damage and repair attempts following stroke are mediated by brain resident as well as immigrating hematogenous cells. However, these processes are far from being understood. The process of endothelial cells losing their endothelial-specific features to gain mesenchymal characteristics called Endothelial-to-Mesenchymal transition (EndMT) has been shown to contribute to the pathophysiology of fibrosis, atherosclerosis, cancer but also embryogenesis. Here, we report that ischemic stroke induces an EndMT-like process.
Methods: Mice were subjected to experimental stroke (MCAO). EndMT-transcription factor and EndMT-marker were evaluated by RT-PCR 6h (n=5) and 24h (n=4) post stroke. Markers for early (CD44), late EndMT (Fibronectin), EndMT-transcription factor Snail1/2 and endothelial stemness (CD133) were quantified 24h and 72h after stroke (n=6). Additionally, EndMT-marker were evaluated immunohistochemically on sections of stroke patients.
Results: Experimental stroke results in an upregulation of EndMT-transcription factors *Snai1, Snai3* and IL-1 receptor antagonist *Il1rn* 6h

after MCAO ($p<0.05$). Twenty-four hours following MCAO EndMT-transcription factor *Snai1* and EndMT-markers *Vim* (Vimentin) and *Fn1* (Fibronectin) were upregulated ($p<0.05$). Immunohistochemical quantification confirmed stroke induced upregulation of endothelial stem-cell marker CD133, early EndMT-marker CD44 and late-stage EndMT-marker Fibronectin as well as transcription factor Snail1/2 within the ischemic brain. The study on human brain samples confirmed the expression of EndMT-marker S100A4 and Vimentin in consequence of stroke.

Conclusions: Understanding the role of the Endothelial-to-Mesenchymal transition within the pathophysiology of stroke will contribute to our further understanding of the mechanisms leading to the progressing brain damage but also repair and could represent a new promising therapeutic target.

Disclosure of interest: No

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Preclinical validation of human recombinant glutamate-oxaloacetate transaminase for the treatment of acute ischemic stroke

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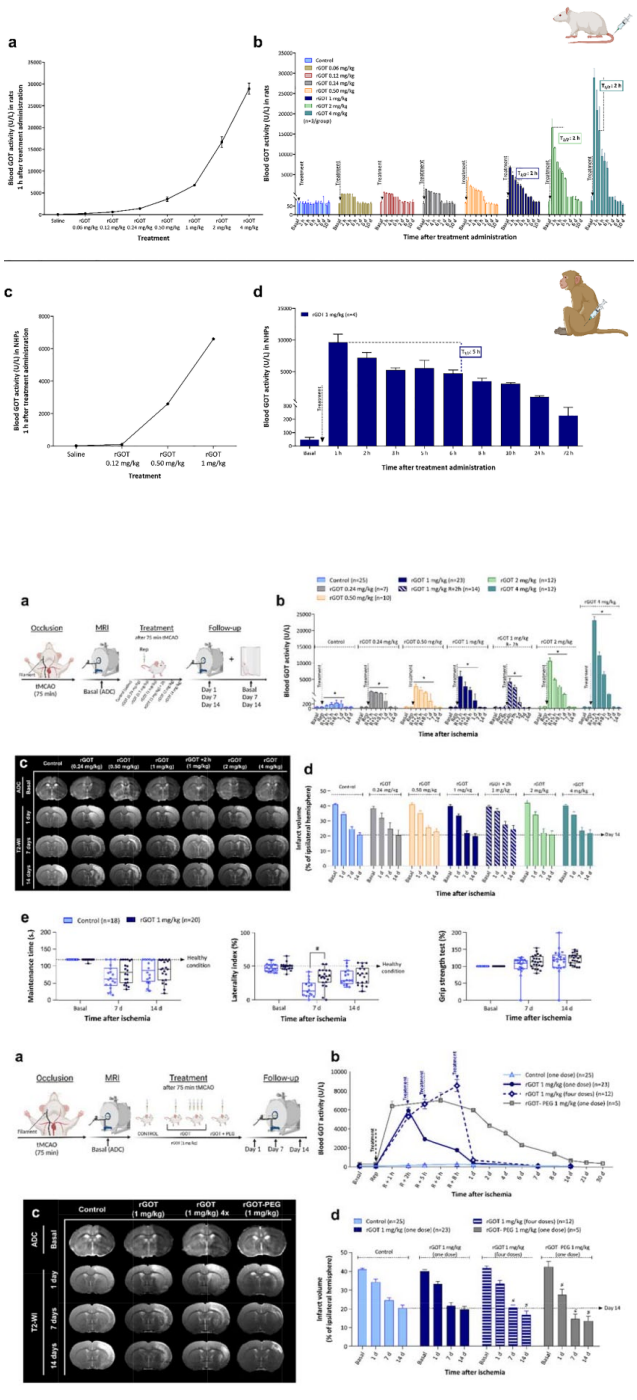
Background and aims: Recent results have provided strong evidence that the blood-resident enzyme glutamate-oxaloacetate transaminase (GOT) can be exploited as an efficient target for stroke brain protection. In this study a new human recombinant form of GOT (rGOT) was manufactured and tested in brain ischemic conditions.

Methods: The expression of rGOT was induced in *E. Coli* using small ubiquitin-like modifier (SUMO) fusion technology. Tolerability and pharmacokinetic activity of the drug were tested in healthy rats and NHP models. For therapeutic evaluation, a dose-escalation and multiple-dose study, including a time-window analysis were developed ischemic rat models submitted to severe and mild ischemia. Protein bioconjugates (rGOT-PEG) with sustained activity in the bloodstream was also tested in ischemic conditions. *In vitro* and *in vivo* interaction essays were included to determine if the thrombolytic action of rtPA was adversely affected in combination with rGOT. Finally, distribution and effect of rGOT treatment on brain was evaluated by CSF, proteomic and PET.

Results: The tolerability analysis suggests that rGOT can be safely used immediately in patients with a suspected ischemic stroke. Four consecutive doses of 1 mg/kg rGOT administered during the first 8 h was the most protective protocol in both mild (45 min) and severe (75 min) ischemia (beginning before 2 h after arterial reperfusion). Distribution assessment indicates that rGOT can reach the brain and induce the activation and downregulation of proteins related with cell survival.

Conclusions: Our findings establish that tissue neuroprotection and improved functional outcomes after stroke are unequivocally achievable with rGOT treatment.



Disclosure of interest: No

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INHIBITION OF LEUCOCYTE MIGRATION BY VE-CADHERIN MUTATION LEADS TO REDUCED INFARCT VOLUMES AND IMPROVED MOTOR SKILLS

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Background and aims: To investigate the effects of selective inhibition of transendothelial leukocyte migration or impaired vascular permeability after ischemic stroke, two knock-in mouse lines with two different point mutations in VE-Cadherin (Y731F and Y685F) were used in this study. By comparing these two mouse lines, we wanted to distinguish the genuine cellular impact of the ischemic cascade caused by leukocytes from unspecific effects of edema and humoral components.
Methods: Ischemic stroke was induced by a model of middle cerebral artery occlusion (MCAO) for 45 minutes. Mice expressing the Y731F or Y685F mutant were compared to their wildtype littermates regarding structural and functional outcomes as well as the extent of leucocyte migration. Functional outcome was defined by a neuroscore, rotarod test and foot fault test. Structural outcome implied infarct volume and brain edema in histological analysis. To determine extent and spatial distribution of leucocyte migration, immunohistochemistry was performed on coronal cryostat sections which were analysed under fluorescence microscope.
Results: Selective inhibition of transendothelial leucocyte migration improved motor skills (rotarod test: 85,52 ± 13,24 sec vs. 43,06 ± 15,32 sec, p=0,0285, two-way ANOVA) and reduced infarct volumes (52,33 ± 4,719 mm^3 vs. 70,43 ± 6,483 mm^3, p=0,0252, Mann-Whitney-U-Test). Impaired vascular permeability had no effect on structural or functional outcomes. Immunohistochemical analyses showed no difference in frequency or spatial distribution of immune cells in the ischemic brain parenchyma in the groups being compared.
Conclusions: Selective inhibition of leucocyte migration leads to smaller infarct volumes and improved motor skills.
Disclosure of interest: No

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LEVELS OF VASCULAR ENDOTHELIAL GROWTH FACTOR-A AS A MARKER OF COLLATERAL CIRCULATION IN PATIENTS WITH ACUTE ISCHEMIC STROKE AND LARGE-VESSEL OCCLUSION

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Background and aims: Vascular endothelial growth factor A (VEGF-A) is involved in angiogenesis. We aimed to study whether higher VEGF-A plasma levels are associated with better Collateral Circulation (CC) in patients with acute ischemic stroke (AIS) and large-vessel occlusion (LVO).
Methods: Prospective multicenter study of patients with anterior circulation AIS due to LVO treated with endovascular therapies within the first 24 hours after onset. Blood samples were obtained on admission before endovascular treatment. Plasma VEGF-A levels were quantified by ELISA and classified into quartiles. The primary outcome was CC at admission classified by Collateral Score (CS). The CS was assessed by automated and validated software (Brainomix®) from baseline single-phase CT angiography: poor, filling of ⩽10% of the occluded MCA territory; moderate, 11-50%; good, 51-90%; excellent, >90%. We performed shift-analysis and multivariable ordinal logistic analysis using a backward stepwise regression approach to predict CS.
Results: We included 297 patients (mean age 72.6±13.5 years; 50.8% women; 66.8% time from stroke onset to admission <6h). CS was poor in 6.0%, moderate in 17.5%, good in 43.2% and excellent in 33.3%. Better CC was associated with lower age, lower baseline NIHSS score, higher ASPECTS, longer time from stroke onset to admission and higher plasma VEFG-A levels. In the final multivariable analysis adjusted by age and baseline NIHSS, higher plasma VEGF-A levels were associated with better CS (aORx1 quartile increase=1.33, 95%CI 1.04-1.71; p=0.025).
Conclusions: In patients with AIS due to large-vessel occlusion, higher concentrations of plasma VEGF-A were associated with better collateral circulation.
Disclosure of interest: No

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PARABIOSIS DISCRIMINATES THE VASCULAR VERSUS PARENCHYMAL CONTRIBUTION OF ENDOGENOUS TISSUE-TYPE PLASMINOGEN ACTIVATOR TO STROKE

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Background and aims: Intravenous injection of recombinant tissue-type plasminogen activator (tPA) as a thrombolytic agent has revolutionized the management of ischemic stroke patients. Several observations suggest that tPA, either endogenous (neuronal and endothelial) or

exogenous may also worsen the loss of integrity of nerve cells and of the blood/brain interface during stroke, thus limiting the benefit of thrombolysis. However, the respective role of neuronal tPA versus circulating tPA in the cerebrovascular physiopathology is not well known.
Methods: Accordingly, here, we developed parabioses between tPA deficient mice (tPA^{Null}) and/or wild-type mice (tPA^{WT}), anticipating that a tPA^{WT} mouse restores circulating levels of tPA to normal levels in a tPA^{Null} parabiont, without affecting levels in other organs. Then, stroke damages were investigated by MRI in a thrombo-embolic or a thrombotic stroke model, induced by thrombin- or $FeCl_3$, respectively.
Results: Our data reveal in the thrombin stroke model, after 24 hours, that tPA^{Null}/ tPA^{Null} parabionts displayed less spontaneous recanalization/ reperfusion and larger infarct volumes compared to tPA^{WT}/tPA^{WT} littermates. However, when linked to a tPA^{WT} ischemic partner, tPA^{Null} mice had less severe perfusion deficits and brain infarcts than when linked to a tPA^{Null} mouse. In the $FeCl_3$ model of stroke, homo- and hetero-typic parabionts did not differ in the extent of brain damages and did not recanalize/reperfuse.
Conclusions: All together, these data suggest that endogenous parenchymal tPA has a limited overall impact during thromboembolic stroke, and that endogenous circulating tPA from endothelial cells sustain a partially efficient vascular patency.
Disclosure of interest: No

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BORDER-ASSOCIATED MACROPHAGES (BAMs) ACQUIRE DURING AGING A PROTECTIVE ROLE AGAINST NEUROINFLAMMATION AFTER STROKE

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Background and aims: Aging is a major non-modifiable risk factor for stroke, and is linked to a state of low-grade inflammation, known as "inflammaging." While the responses of microglia have been studied in the past, the role of border-associated macrophages (BAMs) in stroke during aging has not been investigated. Our study aimed to test the hypothesis that BAMs acquire a phenotype during aging that can affect stroke-induced inflammatory responses and ultimately, stroke recovery.
Methods: Using cell-sorted RNAseq and immunohistochemistry, we analyzed phenotypic changes of BAMs during aging in mice and humans. To study the functional implications, we conducted a series of experiments to examine all steps of leukocyte trafficking through the BBB, including endothelial activation, leukocyte rolling and adhesion, and infiltration into the brain parenchyma, after a thromboembolic stroke in young and old mice.
Results: We found that BAMs change their transcriptomic phenotype during aging, overexpressing genes involved in the regulation of innate and adaptive immune responses, leukocyte-mediated immunity. We also confirmed these changes in aged human brains, further supporting the role of BAMs in regulating neuroimmune responses during aging. The inflammatory and immune responses to stroke were exacerbated in aged mice with depleted BAMs and associated with worsened functional outcome at both the acute and sub-acute phases after stroke onset.
Conclusions: Our study provides evidence that BAMs acquire a phenotype during aging that can affect stroke-induced inflammatory responses and stroke recovery. These findings highlight the potential of BAMs as a therapeutic target for stroke in the aged population.
Disclosure of interest: No

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EXOGENOUS LACTATE ADMINISTRATION INFLUENCES POST-ISCHEMIC NEUROINFLAMMATORY EVENTS

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Background and aims: Despite recent advances in primary stroke therapeutic strategies, patient selection criteria and extended therapeutic windows, a good outcome is not guaranteed even for treated patients, and stroke remains the leading cause of long-term disability. Aiming to improve treatment efficacy, current neuroprotection approaches are expanding their potential targets beyond neurons by addressing the altered physiology of glial cells and of the vascular compartment, both directly affected by the ischemic event and involved in delayed damage and brain repair mechanisms. The administration of lactate, a glycolysis metabolite commonly used in clinics as a constituent of fluid replacement solutions, has beneficial effects on functional recovery from damage caused by acute brain injury in both preclinical animal models and human patients. Our aim was to determine whether lactate administration had an impact on glial and vascular brain cells in the acute post-ischemic phase.
Methods: Male C57BL/6 mice were subjected to 30 minutes middle cerebral artery occlusion and intravenously injected with 1 mmol/kg lactate or vehicle at reperfusion. Mice were sacrificed at 72h post-intervention, and their fixed brains were immunostained for astrocytic, microglial, vascular and proliferation markers.
Results: We observed that lactate increased proliferation in the lesion's vascular compartment, which could contribute to its remodeling. Moreover, in lactate-treated mice, both astrocytes and microglial cells located at the boundary between damaged and still-healthy tissue showed altered structure, with increased morphological complexity.
Conclusions: Our results suggest that lactate has an influence on post-ischemic neuroinflammatory events that could contribute to promoting better recovery.
Disclosure of interest: No

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Closer to the clinic: A new model to characterize ischemic stroke in fully awake mice

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Background and aims: Pre-clinical trials are actually an essential step either to test new therapeutic strategies or to characterize physiopathological phenomena. In order to increase translational research, animal models have to be as close as possible to the clinical situation. Despite researcher's efforts, unfortunately, all new molecules validated in animal models have failed in clinical trials. The reason for this conundrum is unclear, but we postulate that the anaesthetics used for preclinical studies influence the lesion formation and evolution hindering pharmacological strategies effects.
Methods: The objective of this work is to propose a fully awaken animal model including ischemic stroke induction and the complete follow up by medical imaging (MRI). For that purpose, a 3D designed prosthesis was bond to the mice skull allowing head restraint after a habituation phase for the stoke induction and for the MRI acquisitions. The middle cerebral artery was exposed under general anaesthesia allowing awake microinjection of thrombin in the artery lumen the next day. The effects of the tPA was evaluated using MRI at 1 hour and 24 hours post-stroke onset.
Results: This work demonstrates the possibility to perform both thromboembolic stroke and further MRI exploration in rodent without anaesthesia as it comes in real human life.
Conclusions: This new approach would be a useful tool to unmask the effects of therapeutic strategies in preclinical studies and optimize their evaluation to provide an increased success rate for subsequent clinical trials.
Disclosure of interest: No

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ELECTRICAL IMPEDANCE MEASUREMENTS CAN PREDICT RED BLOOD CELL CONTENT IN ACUTE ISCHEMIC STROKE CLOTS RETRIEVED BY MECHANICAL THROMBECTOMY

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Background and aims: Electrochemical impedance spectroscopy can convey information about biological tissues by determining characteristics like cell density, size and shape. The development of an electrical impedance-based medical device that could predict acute ischemic stroke (AIS) clot characteristics in the acute care setting, could improve stroke patient outcomes by informing clinical decision-making. We assessed how well electrical impedance combined with machine learning predicted red blood cell (RBC) composition of AIS clots, clots that could be removed in one pass and the first pass effect (FPE).
Methods: 273 blood clots were analysed in the Clotbase International registry. Impedance measurements were taken following clot retrieval by thrombectomy, followed by histological compositional analysis using Martius Scarlet Blue (MSB) stain. The components were quantified via Orbit Image Analysis Software and correlated with impedance predictions and analysed using non-parametric Kruskal-Wallis test.
Results: MSB staining identified RBCs as the major component in clots (mean:38.2%); platelets/other (30.1%); fibrin (25.2%); white blood cells (5.6%). The impedance-based RBC prediction model correlated well with RBC content determined by histology, with a slope of 0.9 and Pearson correlation coefficient ϱ=0.66. Clots removed from M1 in one pass were significantly higher in RBC than those requiring more passes using both histology measurements ($p<0.001$) and impedance prediction ($p<0.01$). Clots removed successfully in FPE were richer in RBCs as assessed using histology ($p<0.01$) and impedance prediction ($p<0.01$).
Conclusions: Electrical impedance predictions of RBC content in AIS clots are consistent with histological findings and have predictive potential for clinically relevant parameters.
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Disclosure of interest: No

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HIGHER BURDEN OF CLONAL HEMATOPOIESIS OF INDETERMINATE POTENTIAL IN PLAQUES OF PATIENTS WITH SYMPTOMATIC COMPARED TO ASYMPTOMATIC CAROTID ARTERY STENOSIS

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Background and aims: Clonal hematopoiesis of indeterminate potential (CHIP) could be a new risk factor for stroke. We hypothesized that CHIP presence and quantity would differ in symptomatic versus asymptomatic carotid plaques.
Methods: We prospectively enrolled patients $\geqslant$70 years after carotid endarterectomy for symptomatic and asymptomatic carotid artery stenosis. Peripheral blood and tissue samples from carotid plaque were examined both for presence and quantity of mutations. Presence of mutations was identified across 38 often mutated genes in CHIP by a sensitive method of massively parallel sequencing with error suppression. Quantity

of mutations was defined as a sum of fractions of mutated DNA in sample.
Results: Of 46 patients, mean age 75±5, 22% women, 31 (67%) had CHIP in the blood and 21 (46%) in the carotid plaque. In 21 symptomatic vs. 25 asymptomatic carotid stenosis, CHIP was present in 67% (95%CI: 43-85) vs. 68% (95%CI: 46-85) in the blood and 57% (95%CI: 34-78) vs. 36% (95%CI: 17-57) in carotid plaques, respectively. In symptomatic vs. asymptomatic carotid stenosis mean cumulative fraction of mutations was 9.6% vs. 3.3% (p=0.003) in the blood and 6.8% vs. 2.6% (p=0.018) in plaques. The most frequent CHIP mutations were in *DNMT3A, TET2*, and *ASXL1*.
Conclusions: Despite the similar CHIP presence in the blood of the patients with symptomatic and asymptomatic carotid stenosis, we found higher CHIP presence and fractions in the symptomatic plaques. This suggests that CHIP may not be a risk factor for atherosclerosis; however, it could contribute to thrombosis on already existing plaques.
Disclosure of interest: No

PATHOPHYSIOLOGY OF STROKE / TRANSLATIONAL MEDICINE

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CHARACTERIZATION OF VASOGENIC AND CYTOTOXIC BRAIN EDEMA FORMATION IN A MOUSE MODEL OF ISCHEMIC STROKE USING FREE WATER MRI

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Background and aims: Brain edema (BE) formation is a severe complication following ischemic stroke and associated with poor outcome. BE forms during ischemia, but also after reperfusion, however, the temporal and spatial profile and the type of BE have not been well characterized yet. In the current study we used longitudinal free water MR imaging, a novel technique, to characterize BE formation after experimental ischemic stroke.
Methods: Male C57BL/6 mice were subjected to 60-180 minutes of middle cerebral artery occlusion using an intraluminal filament (fMCAo) followed by 23h of reperfusion. T2 and diffusion weighted images were taken 30min, 1h, 2h, 3h after occlusion and 30min, 5h, 23h after reperfusion and analyzed for midline shift and type of BE by using a bi-tensor model to distinguish between intra- and extracellular water.
Results: Already 30 minutes after fMCAo massive cytotoxic brain edema was present in ischemic tissue. Following reperfusion cytotoxic edema almost completely disappeared and a second wave of cytotoxic brain edema formation developed over a period of 23h and slowly spread from the ischemic core (striatum) to the adjacent cortex. Reperfusion was accompanied by significant hemispheric swelling.
Conclusions: We successfully used longitudinal free water MRI to characterize the type of brain edema which forms during and after cerebral ischemia. Ischemic as well as reperfusion edema were mainly cytotoxic but showed a very different temporal and spatial profile suggesting different underlaying mechanisms. Further investigations using this novel technology are needed to exploit the therapeutic potential of reperfusion edema.
Disclosure of interest: No

PATHOPHYSIOLOGY OF STROKE / TRANSLATIONAL MEDICINE

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Neuronal loss after ischemic stroke can be reduced by preventing adhesion of leukocytes to pial post-capillary venules

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Background and aims: Leukocytes may damage the brain after cerebral ischemia either by capillary plugging or by transmigration into ischemic tissue; however, the relative relevance of both processes is still under debate. Therefore, we investigated the spatial and temporal profile of capillary plugging, vascular adhesion, and neuronal cell death in the same model of ischemic stroke by *in vivo* microscopy.
Methods: Male C57BL/6 mice, FucT IV/VII- and ICAM-1-deficient mice were subjected to MCAo. Capillary plugging, vascular adhesion, leukocyte transmigration, and neuronal cell death were investigated within the first hour and 2, 5, 9, and 15 hours after MCAo by *in vivo* 2-photon microscopy or by immunohistochemistry.
Results: Leukocytes plugged capillaries only in the infarct core; adhesion of leukocytes to venules occurred only in the ischemic penumbra. Leukocyte adhesion peaked five hours after reperfusion, while neuronal cell death started with a mean delay of more than three hours. Leukocytes transmigrated into penumbral tissue in low numbers (five leukocytes per 200 neurons) only after neuronal cell death already occurred. Blocking the function of CD18 or ICAM-1 reduced vascular adhesion of leukocytes significantly and increased the number of viable neurons by 5-fold, without affecting the migration of leukocytes into the brain.
Conclusions: Our data show that the only process preceding neuronal cell death we could identify in penumbral tissue is leukocyte adhesion to pial post-capillary venules. Inhibiting this interaction resulted in significant neuroprotection. Hence, our data indicate that early inhibition of vascular leukocyte accumulation may represent a relevant target for stroke treatment.
Disclosure of interest: No

PATHOPHYSIOLOGY OF STROKE / TRANSLATIONAL MEDICINE

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CX213: Macrophage-targeting nanozyme for treating subarachnoid hemorrhage

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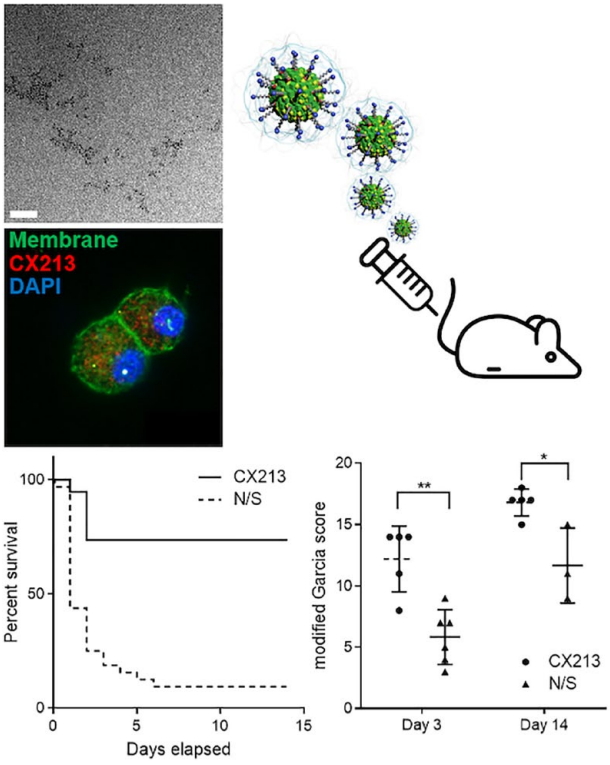
Background and aims: The burst release of reactive oxygen species (ROS) after subarachnoid hemorrhage (SAH) acts as a strong pro-inflammatory signal by activating microglia/macrophages as well as being cytotoxic by themselves. The activation of the mononuclear phagocytic system (MPS), including blood-circulating monocytes and the splenic monocyte reservoir, has a crucial role in this sterile inflammation, leading

to widespread brain injury after SAH. We report CX213, MPS-targeting nanozymes of a new entity based on cerium oxide hybridized with polymers. We investigated the macrophage-selective uptake properties of CX213. The anti-inflammatory and mortality-reducing effects of CX213 were investigated in an SAH animal model.

Methods: We designed CX213 to consist of cerium oxide nanoparticles bonded with biocompatible polymers. Cellular uptake properties of CX213 against the various cell types were investigated. After inducing SAH by perforating the middle cerebral artery in the Sprague-Dawley rats, 0.1 mg Ce/kg of CX213 was intravenously administered at 1 hour, and a modified Garcia neurobehavioral score and mortality were recorded for 14 days.

Results: The CX213 had a hydrodynamic size of 18.0 ± 5.0 nm and a surface charge of -40.5 ± 2.0 mV and effectively reduced ROS. Macrophages captured CX213 more efficiently than other cell types. CX213 reduced the recruitment of neutrophils and monocytes/macrophages and neuronal death around the lesion after SAH. The CX213-treated group had a significantly better neurobehavioral score and survival than the control.

Conclusions: CX213, a novel nanozyme, is effectively captured by macrophages, leading to reduced brain damage against SAH via inhibiting monocyte/macrophage-related inflammation.



Disclosure of interest: Yes

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IDENTIFICATION OF DRUG TARGETS FOR ANEURYSMAL SUBARACHNOID HAEMORRHAGE USING GENETIC METHODS

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Background and aims: No effective drug options exist for aneurysmal subarachnoid haemorrhage (ASAH). We previously found overlap between genetic causes for intracranial aneurysms (IA) and ASAH, and targets of anti-epileptic drugs. Here, we aimed to identify drug classes of which their usage is causally related to (reducing) IA/ASAH liability.

Methods: Genome-wide association study (GWAS) summary statistics were obtained from the UK Biobank (drug class usage), and the largest GWAS of IA/ASAH (7,495 cases, 71,934 controls, excluding UK Biobank). Genetic correlation was assessed between drug class usage, and IA/ASAH liability. Then, Mendelian randomization (three algorithms: CAUSE, GSMR, two-sample MR) was used to assess if these correlations indicate causality. As sensitivity analyses, we performed reverse Mendelian randomization, conditioning on blood pressure, and sex-stratified analyses.

Results: There was widespread statistically significant ($P<0.05/70$) genetic correlation between drug classes and IA/ASAH, including antidepressants, several analgesics classes, and several cardiovascular system drug classes. Stratified analysis suggested that the overlap between IA and antidepressants was stronger for women than for men (women: correlation=33%+/-11%, P=0.003, men: correlation=26%+/-10%, P=0.10). Mendelian randomization analyses suggested a causal effect of some drug classes, but could not rule out reverse causation.

Conclusions: IA and ASAH share underlying genetic mechanisms with anti-depressants, analgesics, and cardiovascular system drugs. Causality remains unclear, but since ASAH has a low incidence, the overlap is unlikely a result of ASAH causing the usage of these drugs.

We found a potential novel indication for paracetamol, which is known to improve outcome of ischaemic stroke.

Disclosure of interest: No

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Genetic Analyses of Oral Health and Neuroimaging Markers of Brain Health in Persons without Stroke

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Background and aims: The role of oral health on brain health among clinically asymptomatic persons remains understudied. We hypothesize that genetically-determined poor oral health leads to worse neuroimaging brain health profiles in persons without stroke.

Methods: We conducted a two-sample Mendelian Randomization (MR) study. As instruments, we used 105 genetic variants known to be associated ($p<5x10^{-8}$) with a composite of caries, dentures, and missing teeth in the Gene-Lifestyle Interactions in Dental Endpoints (GLIDE) Consortium. In stroke-free participants enrolled in the UK Biobank, we tested for associations between these genetic variants and white matter hyperintensity (WMH) volume, fractional anisotropy and mean diffusivity. For the last two neuroimaging traits, we evaluated composite scores defined by the first principal component of measurements obtained across 48 brain regions.

Results: Our primary analysis using the inverse variance-weighted MR method indicated that genetically-increased risk of poor oral health was associated with: higher burden of silent cerebrovascular disease, as represented by a 30% increase in WMH volumes (beta=0.30; SE=0.06; p-value<0.001), and increased microstructural damage, as represented by a 43% change in composite FA scores (beta=0.43; SE=0.06; $p<0.001$) and a 9% change in composite MD scores (beta=0.09; SE=0.03; p=0.005).

Sensitivity analyses identified horizontal pleiotropy, but an outlier-corrected analysis confirmed each of our findings ($p<0.001$).

Conclusions: Among persons without stroke, genetically-determined poor oral health is associated with worse neuroimaging brain health profiles. Because gene-disease associations are immune to confounding, our results suggest that this association is causal. Early treatment of poor oral health may lead to significant brain health benefits, even in persons without stroke.

Table 1. Mendelian Randomization results. Outcomes are association tests against aggregate metrics for FA/MD in UKB.

Outcome	Primary Mendelian Randomization Analysis			Pleiotropy Mendelian Randomization Analysis			Corrected Mendelian Randomization Analysis		
	Number of instruments	Beta (SE)	P value	Presence of pleiotropy	N of outlier SNPs	Distortion Test P value	Number of instruments	Beta (SE)	P value
White matter hyperintensity volume	116	0.24 (0.07)	$3x10^{-6}$	Yes	7	0.76	110	0.27 (0.07)	$1x10^{-9}$
Fractional anisotropy	116	0.43 (0.06)	$5.9x10^{-11}$	Yes	4	0.29	112	0.46 (0.06)	$1.2x10^{-12}$
Mean diffusivity	116	0.09 (0.08)	0.005	Yes	6	0.18	111	0.08 (0.03)	0.009

Disclosure of interest: No

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COMBINED PROTEOMICS AND MACHINE LEARNING APPROACH TO IDENTIFY NEW POTENTIAL BLOOD BIOMARKERS FOR DIAGNOSING PATIENTS WITH ISCHEMIC STROKE

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Background and aims: Blood biomarkers are a potential tool for early stroke diagnosis. We aimed to perform an exploratory study on untargeted blood biomarkers in patients with suspected stroke by using a combined approach of mass spectrometry analysis and machine learning.

Methods: Prospective observational study of consecutive patients with a suspected stroke admitted within 6h last-seen-well. Blood samples were collected at hospital admission. Patients were divided into three groups: Ischemic stroke (IS), intracerebral hemorrhage (ICH) and stroke mimics (SM). Quantitative analysis from mass spectrometry data was performed using a supervised approach. Biomarker-based prediction models were developed to differentiate IS from ICH and from ICH+SM. Models were built targeting 100% specificity for IS.

Results: 90 patients were included, one-third within each subgroup. Median age was 71 (IQR 57–81) years and 49 (54.4%) were female. In quantitative analysis, complement component-3 (C3), intercellular adhesion molecule-2 (ICAM-2), plasminogen like-A (PLGLA), syntaxin binding protein-5 (STXBP5) and immunoglobulin heavy variable 3-64 (IGHV3-64) were the five most significantly dysregulated proteins for both comparisons. Biomarker-based models showed a 75% sensitivity and 80% negative predictive value (NPV) for differentiating IS from ICH, and a 75% sensitivity and 95% NPV for differentiating IS from ICH+SM. In both models, most relevant biomarkers were C3, ICAM-2, PLGLA and IGHV3-64.

Conclusions: In this exploratory study, our biomarker-based prediction models including C3, ICAM-2, PLGLA and IGHV3-64, showed a 75% sensitivity at 100% specificity for identifying patients with ischemic stroke. These results need to be validated in other cohorts and with different measurement techniques.

Disclosure of interest: No

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PROGNOSTIC BIOMARKERS FOR PREDICTING POOR OUTCOME AND MORTALITY AFTER ISCHEMIC STROKE AND INTRACEREBRAL HEMORRHAGE USING A TARGETED PROTEOMICS APPROACH

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Background and aims: An early prediction of functional outcomes in stroke is critical to improve patient care. We aimed to determine biofluid biomarkers to predict 90-day and 180-day poor outcomes (Rankin score 3-6) and mortality after ischemic stroke (IS) and intracerebral hemorrhage (ICH).

Methods: We collected serum samples within 24 hours of onset. Multiple Reaction Monitoring based targeted proteomics determined the prognostic performance of 22 candidate protein biomarkers. Telephonic follow-up was conducted at 90-day and 180-day. In addition, we developed multivariable logistic or Cox regression prediction models including clinical variables with and without biomarkers using Odds Ratio (OR)/hazard ratio (HR) and 95% Confidence Interval (CI). Statistical analyses were conducted using STATA 13.1 and R version 3.6.2.

Results: The study included 300 stroke subjects (150 IS and 150 ICH). Loss to follow-up and mortality at 90-days was 5% and 28.77% and at 180-days was 7.33% and 31.65%. Multivariable analyses determined biomarkers that independently predicted: 90-day poor outcome after IS [APOH (OR 2.93; 95%CI 1.00-8.56)] and ICH [Alpha-2-macroglobulin (OR 8.77; 95%CI 2.16-35.63) and UCH-L1 (OR 6.73; 95%CI 1.89-23.96)], 90-day mortality after IS [IGFBP3 (HR 3.05; 95%CI 1.18-7.91)] and ICH [IGFBP3 (HR 1.86; 95%CI 1.10-3.16) and APO-C1 (HR 1.13; 95%CI 1.00-1.27)], 180-day poor outcome after IS [Serpin-A11 (OR 3.57; 95%CI 1.35-9.43)] and ICH [Alpha-2-macroglobulin (OR 5.70; 95%CI 1.69-19.24)], and 180-day mortality after IS [IGFBP3 (HR 2.87; 95%CI 1.12-7.39)] and ICH [MMP-9 (HR 1.83; 95%CI 1.07-3.14)].

Conclusions: Protein biomarkers independently predicted short-term poor outcome and mortality after IS and ICH in multivariable prediction models.

Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

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CIRCULATING BIOMARKERS OF STROKE IN CANCER PATIENTS: A PILOT STUDY

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Background and aims: Although the association between stroke and cancer is known, the reason for increased stroke risk in cancer is still debated. Recently, epigenetic alterations in stroke, including the modulation of microRNA (miRNA) expression, has gained attention. We analyzed blood samples from patients with active solid cancer and stroke to identify any circulating biomarker or causative factor possibly predicting or being associated with higher risk of stroke.

Methods: A prospective cross-sectional study was performed on three adult patient groups: Group 1, active cancer and acute ischemic stroke; Group 2, acute ischemic stroke without cancer; Group 3, active solid cancer without stroke. Liquid biopsies were analyzed through a custom detection and amplification protocol based on high-sensitive droplet digital PCR system.

Results: We identified two miRNAs (hsa-miR-125b-5p and hsa-miR-199a-5p) involved in the regulation of multiple genes associated with key cellular and molecular pathways, namely the alteration of complement and coagulation cascades, and inflammatory and angiogenetic processes (Fig1). These candidate biomarkers showed good predictive value for stroke risk in cancer patients (Fig2).

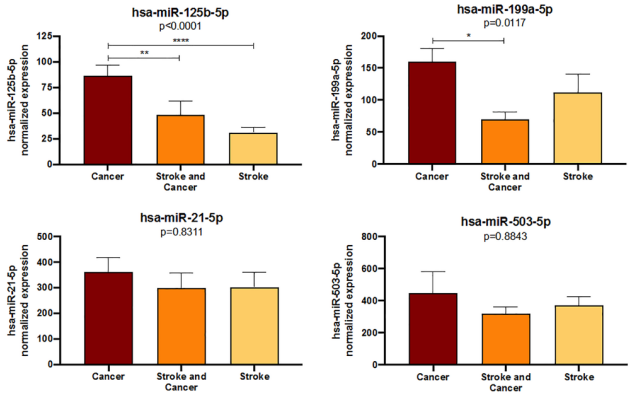

Fig. 1. Differences of serum expression levels of selected miRNAs among cancer, stroke, and cancer + stroke patients. Values are expressed as mean±SEM. Kruskal-Wallis and Dunn's multiple comparison tests: * $p<0.05$; ** $p<0.01$; **** $p<0.0001$.

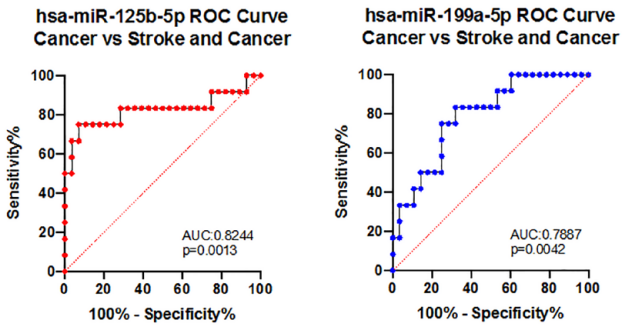

Fig. 2. ROC analyses for the two significantly dysregulated miRNAs (hsa-miR-125b-5p and hsa-miR-199a-5p) in cancer and cancer + stroke patients.

Conclusions: Although further validation is needed, this pilot study might lead to an improvement in the diagnosis and management of early identification of stroke in cancer patients.

Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

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Genomic Variation affecting MPV and PLT count in association with Development of Ischemic Stroke and its subtypes

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Background and aims: Platelets play a significant role in pathophysiology of ischemic stroke since they are involved in the formation of intravascular thrombus after erosion or rupture of the atherosclerotic plaques. Platelet (PLT) count and Mean platelet volume (MPV) are the two significant parameters that affect functions of the platelets.

Methods: In the current study MPV and PLT count was evaluated using flow cytometry and cell counter. SonoClot analysis was carried out to evaluate Activated Clot Timing (ACT), Clot Rate (CR) and Platelet Function (PF). Genotyping was carried out GSA and Sanger sequencing and expression analysis was carried out using RT-PCR. In silico analysis was carried out using GROMACS tool and UNAFold. The interaction of significant proteins with other proteins was predicted using STRING database.

Results: 96 genes were analyzed and a significant association of THPO (rs6141) and ARHGEF3 (rs1354034) was observed with the disease and its subtypes. Expression analysis revealed a higher expression in patients bearing the variant genotypes of both the genes. In silico analysis revealed that mutation in THPO gene leads to the reduced compactness of protein structure. mRNA encoded by mutated ARHGEF3 gene increases the half-life of mRNA.

Conclusions: In conclusion the current study demonstrated the role of higher MPV affected by genetic variation in the development of IS and its subtypes. The results of the current study also indicate that higher MPV can be used as a biomarker for the disease and altered genotypes and higher MPV can be targeted for better therapeutic outcomes.

Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

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ASSOCIATION OF THE COL4A2 GENE POLYMORPHISMS WITH PRIMARY INTRACEREBRAL HEMORRHAGE RISK AND OUTCOME IN CHINESE HAN POPULATION

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Background and aims: The SNPs in *COL4A2* had been reported to increase intracerebral hemorrhage (ICH) risk in the European and United States population. However, whether they could impact the ICH incidence and outcome among Chinese remains unclear. We aimed to investigate the associations of *COL4A2* SNPs with risk and outcome of primary ICH in Chinese Han population.
Methods: A case-control study was conducted, and a total of 8 tag-SNPs were selected. SPSS 24.0 was used to analyze the associations of SNPs with increased risk and poor outcome (mRS 4-6) of primary ICH.
Results: 323 patients and 376 controls were included. Compared to controls, the rs1049931 G allele and rs1049906 C allele enhanced primary ICH risk in Chinese Han population (additive model: rs1049931: adjusted OR 1.41, 95% CI 1.03-1.94, p trend=0.033; rs1049906: adjusted OR 1.37, 95% CI 1.01-1.86, p trend=0.043). The rs1049931 AG/GG and rs1049906 CT/CC genotypes showed increased susceptibility to non-lobar hemorrhage (rs1049931: adjusted OR 1.63, 95% CI 1.06-2.50, p=0.025; rs1049906: adjusted OR 1.63, 95% CI 1.07-2.47, p=0.022). Haplotype analysis showed the CG haplotype (rs1049906-rs1049931) increased risk for ICH (OR 1.36, 95% CI 1.05-1.78, p=0.021). In the cases only analyses, the rs3803230 C allele (OR 1.93, 95% CI 1.12-3.33, p=0.017) and AC haplotype (rs7990214-rs3803230; OR 1.98, 95% CI 1.13-3.46, p=0.015) contributed to 3-month poor outcome after primary ICH.
Conclusions: The *COL4A2* polymorphisms are associated with an increased risk of primary ICH, mainly non-lobar hemorrhage, and worse long-term outcome after primary ICH in Chinese Han population.
Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

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CIRCULATING ANTIGENIC TISSUE-TYPE PLASMINOGEN ACTIVATOR AS AN EARLY BIOMARKER OF HAEMORRHAGIC STROKE

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Background and aims: Stroke is an emergency pathology that requires a rapid support in a dedicated hospital service. Despite the development of brain imaging and specialized units such as neurovascular unit, the time-to-treatment is too often delayed due to a bad orientation of the patients within the care course. The emergency is to identify the subtype of stroke, i.e. ischemic or haemorrhagic, to propose the adapted medical care. To accelerate the identification of stroke's subtype, we propose here to use the levels of total antigenic circulating tPA as a biomarker of haemorrhagic stroke.
Methods: We measured tPA in citrated plasma from 110 ischemic stroke patients and 30 haemorrhagic stroke patients of the Biostroke collection (CHU Caen, France) by ELISA (Molecular Innovations).
Results: We found higher levels of total circulating antigenic tPA in ischemic patients compared to hemorrhagic patients (mean, 2.70 $\pm$ 1.50 and 1.75 $\pm$ 0.96 respectively, $p < 0.0001$, [-1.55 to -0.35] 99% CI, Student test). The multiple logistic regression model that includes tPA plasmatic levels (AUC=0.74) shows a statically difference with the model that only includes groups, age and sex (AUC=0.53), suggesting that tPA levels could discriminate haemorrhagic from ischemic stroke patients.
Conclusions: In our prospective study, we show that measuring circulating antigenic tPA in citrated plasma discriminates haemorrhagic from ischemic stroke patients. This could help for the diagnosis of stroke patients and guide them faster through the care course of stroke in hospital. However, this needs to be confirmed on a larger population in a prospective study.
Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

1470

Aging-dependent Expression of VEGFR1 Is Associated with T Cell immunosenescence in Carotid Atherosclerosis

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Background and aims: Aging and inflammation are thought to be major risk factors for atherosclerosis, while immune aging has long been thought to be harmful because it leads to chronic inflammation. The full extent of the biological changes that lead to immune aging in atherosclerosis is unknown.
Methods: Using GEO (Gene Expression Omnibus) and the Human Aging Genome Resources (HAGR) database, we analyzed differentially expressed aging-related genes in early and advanced human carotid atherosclerosis plaques. In addition, the expression patterns of key genes in immune cell subpopulations and the communications among various immune cells were analyzed by single cell sequencing data.
Results: 26 differentially expressed genes associated with aging in human advanced carotid atherosclerosis, and random forest trees were used to identify 5 key genes with significance. Functional enrichment of DE genes highlights the linkage between plaque development with inflammatory response. Furthermore, single-cell sequencing data analysis revealed that FLT1/VEGFR1 were dominantly expressed in memory T cells, and the proportion of memory T cells was significantly decreased in advanced plaques. According to CellChat analysis, different immune cells activated the VEGF signaling pathway by signaling on memory T cells. Moreover, the results of immunohistochemistry demonstrated that the number of memory T cells decreased, and the senescent level increased as the plaque progressed.

Conclusions: The aging-related gene VEGFR1 may influence plaque progression by mediating memory T cell via the VEGF signaling pathway. VEGFR1 could be a novel immunotherapy target for preventing the formation and progression of advanced atherosclerotic plaques in the carotid arteries.
Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

1810

Diagnostic Performance of MicroRNAs in identifying Ischemic and Hemorrhagic Strokes: A systematic-review and meta-analysis

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Background and aims: MicroRNAs (miRNAs) have emerged as potential biomarkers for diagnosis and differentiation of stroke. miRNAs have a significant role in the pathophysiology of ischemic stroke (IS) and hemorrhagic stroke (HS) and its dysregulation can depict disease risk in individuals.
Methods: A comprehensive literature search was performed in various electronic databases, including PubMed, Embase, Cochrane Library, CINAHL, and Google Scholar up to 17th January 2023. Pooled Standard Mean Deviations (SMDs) with 95% Confidence Intervals (CIs) were calculated to determine the association. Sensitivity analysis was performed to detect the heterogeneity between studies, and Begg's funnel plot assessed any publication biases.
Results: We identified 13 case-control studies with 1223 stroke patients (1065 IS, 158 HS) and 1445 control subjects within 24 hours, involving 11 Asian and two Caucasian population studies. Our findings revealed a significant association between the differential expression of miRNAs and diagnosis of overall stroke (SMD=2.85, 95% CI=1.34 to 4.35). Moreover, a significant relationship was observed between differentially regulated miRNAs and IS event within 24h (SMD=3.20, 95% CI=1.65 to 4.76). No such significance could be seen in case of HS (SMD=0.43, 95% CI=-4.71 to 5.58). Subgroup analysis depicted a significant association between dysregulated miRNA expression and stroke event in Caucasians (SMD=12.21, 95% CI=4.87 to 19.56) but not in the Asian population (SMD=-0.51, 95% CI=-2.97 to 1.95).
Conclusions: The results indicated a significant association between differentially regulated miRNAs and the occurrence of stroke in patients. MiRNAs can serve as biomarkers for diagnosis of acute stroke.
Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

1881

Identification of genetic regulation at the proteomic level in the long-term stroke outcome: A Proteome-Wide Association study

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Background and aims: The stroke outcome depends on multiple factors, including genetics. Proteome-Wide Association studies (PWAS) could help to identify genetic variants affecting the stroke outcome through the modulation at the proteomic level. We aimed to identify long-term outcome (modified Rankin scale at three months (mRS3)) protein biomarkers combining genomics and proteomics.
Methods: We performed a four-stage PWAS using FUSION. In the discovery, we integrated the dorsolateral prefrontal cortex (dPFC) proteomic data from the ROS/MAP cohort (1,475 proteins; 376 subjects) and the GODS mRS3-GWAS (N=1,791 and 8,895,027 single nucleotide variants (SNV)). We validated the results' causality with a Bayesian colocalization and Summary-based-data Mendelian Randomization (SMR). We replicated the significant results in the Banner Sun Health Research Institute dPFC proteomic dataset (1,139 proteins; 152 subjects) (Replication1). In a Replication2, we combined the ROS/MAP dataset with a new mRS3-GWAS (N=688; 7,502,471 SNV). All the PWAS were meta-analyzed with the adaptively weighted Fisher's method. We also performed a transcriptome wide association study (TWAS) in 5,420 genes and 452 human dPFC samples.
Results: Three proteins were significantly associated with the mRS3 ($P<0.05$) in the discovery with high posterior probability 4 in the colocalization. The three proteins were significant in the Replication1 but only THEM4 in the Replication2. Two proteins (THEM4 and APOL2) were significant after Bonferroni adjustment in the meta-analysis. The SMR confirmed the causal association of THEM4 and APOL2 with the stroke outcome.
Conclusions: Our results indicated that the stroke outcome is modulated by genetic variants through a cis-regulation at the proteomic level.
Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

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CONTROLLING FOR CONFOUNDING VARIABLES IDENTIFIES SPECIFIC AND ROBUST MICROBIAL SIGNATURES OF STROKE

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Background and aims: Stroke patients exhibit altered gut microbiota and in animal models, microbiota modulation impacts outcome. Thus, targeting microbiota function to improve recovery may represent a novel therapeutic strategy. Specific associations between microbiota and stroke outcome are unclear, hampered by methodological differences and individual variation. Furthermore, stroke patients are often elderly and present with comorbidities, additionally confounding stroke-mediated microbiota alterations. Here, we aimed to investigate the interaction between host variables and microbial associations with stroke and determine whether controlling for these factors can identify robust signatures
Methods: We screened PubMed until 31/12/2022 for human stroke microbiota studies (case-control and outcome), those without available sequencing data or patient metadata were excluded. Ten 16S rRNA gene sequencing datasets (total n=1423) were included for meta-analysis. Raw reads were uniformly processed and adjusted for batch effects, reducing technical variation. Associations between the microbiota and covariates were assessed using PERMANOVA analysis and random forest machine-learning (ML) models.
Results: We identified multiple host variables confounding stroke-microbiota associations. Among host factors, age and comorbidities accounted for a significant proportion of variation in all studies tested (11.8% and 2.4% respectively). Nevertheless, utilising ML, stroke patient microbiota could be accurately discriminated from that of elderly patients or those with comorbid conditions, with high accuracy (AUC = 0.71, 0.68 respectively), suggesting stroke pathology leads to specific changes in microbial composition.

Conclusions: Correcting for confounding variables in human stroke microbiota studies is necessary to identify microbial associations with outcome and will enable identification of microbial taxa involved in stroke pathobiology.
Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

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THE EXPRESSION OF INFLAMMATORY MARKERS AT mRNA LEVEL IN CRYPTOGENIC YOUNG-ONSET ISCHEMIC STROKE

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Background and aims: About 40% of young onset ischemic strokes are cryptogenic. Our study aims to profile mRNA expression of selected inflammatory markers to understand the pathogenesis of stroke in patients 18-54 years of age.
Methods: Clinical data and whole blood for RNA purification was collected using Tempus™ tubes during acute phase and at 1 year follow-up in 48 patients with cryptogenic ischemic stroke from the Estonian Young Stroke Registry. A total RNA was purified and relative mRNA expression of 9 inflammatory markers (*TNFα, NFKBIA, CXCL8, ICAM1, IL6, PYCARD, CASP1, IL13, NLRP3)* were analyzed at both time-points using real-time quantitative PCR. Clinical data and stroke risk factors were analyzed using linear regression and two-way repeated measures Anova.
Results: mRNA expression of multiple genes related to the *NF-κB* pathway, including *TNFα, NFKBIA, CXCL8, ICAM1* and one gene from the inflammasome pathway, *PYCARD*, was significantly up-regulated in the acute phase. Risk factors and stroke severity did not show relationship with assessed mRNA expression levels. The lack of risk factors was related with reduction of multiple tested markers, including *CXCL8, NFKBIA, ICAM1* and *IL6* at one year after the stroke, while in the presence of any of them, such as smoking, diabetes or hypertension, the corresponding expression changes were not evident.
Conclusions: Our results suggest that active inflammation is associated with acute cryptogenic stroke both in patients with or without stroke risk factors, while more pronounced reduction of inflammatory markers one year after stroke can be observed in patients without the risk factors.
Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

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Genetic Predisposition to Post-Stroke Epilepsy: Results from the UK Biobank and the All of Us Research Program

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Background and aims: Post-stroke epilepsy (PSE) is an important complication of stroke. We hypothesize that a polygenic predisposition to epilepsy is associated with a greater PSE risk in stroke/TIA survivors.
Methods: We conducted a 3-stage genetic association analysis. First, we used the GWASCatalog to identify independent genetic risk variants associated with epilepsy at genome-wide levels ($p<5x10E-8$). Second, we estimated PSE-specific weights by testing the association of these variants with PSE in stroke/TIA survivors in the UK Biobank (UKB). PSE was ascertained using ICD-9 and -10 codes for epilepsy/seizure following a stroke/TIA diagnosis. Third, we tested the association between this newly developed PSE-specific polygenic risk score (PRS) and the PSE risk in stroke/TIA survivors enrolled in the *All of Us* (AoU) Research Program. In stages 2 and 3, association testing entailed multivariable logistic regression adjusting for age, sex, and ethnicity.
Results: PSE data were available for 846 patients (mean age: 59.8; 59% male) in UKB and 60 patients (mean age: 64.4; 50% male) in AoU. We identified twelve independent genetic variants from the GWAS Catalog. We obtained PSE-specific weights by analyzing the UKB. One standard deviation increase in the PRS was associated with a 50% increase in the odds of PSE in AoU (OR: 1.50, 95%CI: 1.24-1.99, p: 0.006). p for PRS interaction with stroke subtypes was 0.48.
Conclusions: Our results indicate that stroke/TIA survivors with an elevated polygenic predisposition to epilepsy have a higher risk of developing PSE. Because the PSE data were sparse, results should be interpreted with caution.
Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

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Serum metabolites could assist in the etiological assessment of patients with Intracerebral Hemorrhage

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Background and aims: Etiological assessment of spontaneous Intracerebral Hemorrhage (ICH) is complex. Several examinations are often required, but even in patients widely studied, the etiology of the ICH can remain unknown. Moreover, many etiologies frequently coexist. The aim of our study was to identify blood biomarkers related to ICH etiology
Methods: We recruited a consecutive cohort of acute ICH patients (<24h of stroke onset) from 2015 to 2020. In all cases, blood samples were obtained at arrival to the emergency department to perform an untargeted metabolomic and lipidomic analysis to detect possible biomarkers related to etiology. The etiological assessment was made with the H-ATOMIC classification (Hypertension, Amyloid Angiopathy (CAA), Tumor, Oral Anticoagulation (OA), Malformation, Infrequent and Cryptogenic). The metabolomic analysis was performed by liquid chromatography coupled to mass spectrometry in serum samples. Multivariate analysis [Partial Least Squares Discriminant Analysis (PLS-DA)] followed by univariate analysis (ANOVA)] was made in order to elucidate and detect potentially discriminatory metabolites. In ANOVA, molecules with False Discovery Rate (FDR) of less than 0.05 were selected.
Results: 166 patients with blood samples were included. 67 (37%) of them died at 3 months. Hypertensive (46%) and CAA (21%) were the more frequent etiologies. OA and CAA and infrequent etiologies had the worse outcome (mortality of 64%, 66%respectively). PLS-DA offered a good differentiation between groups of etiology. In ANOVA, 16 potential metabolites showed FDR of <0.05 and were selected for further validation.

Conclusions: Serum metabolites could provide useful information for the etiological assessment in patients with ICH.
Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

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Serum metabolomic profile could aid to detect patients with Neurological Deterioration during hospitalization in patients with Intracerebral Hemorrhage

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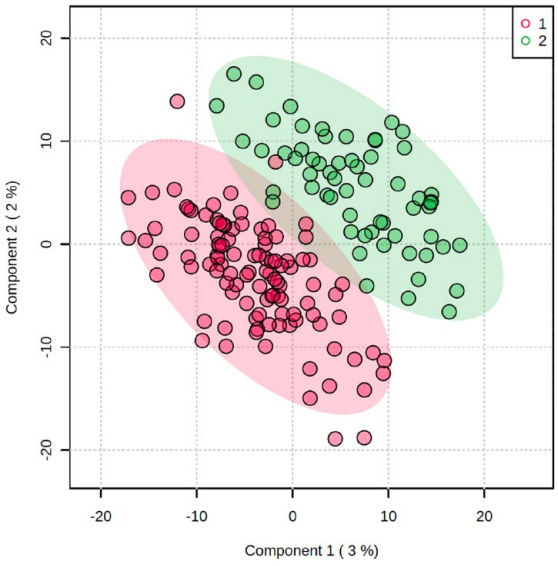
Background and aims: Neurological Deterioration (ND) is the worsening of neurological symptoms that can occurs after the onset of Intracerebral Hemorrhage (ICH). Among its causes, hematoma expansion is the main one, but others exist. ND is one of the main contributors of poor outcome in patients with ICH. Currently, there are no markers which allow to anticipate it.
We aimed to analyze if a set of serum metabolites was related to the development of ND in ICH patients.
Methods: Blood samples in the acute phase of stroke were obtained in a cohort of patients with ICH. ND was defined by an increase of NIHSS score of more than 3 points, or a decrease in Glasgow score of 1 or more points in the 7 days after stroke.
Untargeted metabolomic analysis was performed by liquid chromatography coupled to mass spectrometry in serum samples. Multivariate analysis [Partial Least Squares Discriminant Analysis (PLS-DA)] followed by univariate analysis (T-student)] was made. In T-Student, molecules with False Discovery Rate (FDR) of less than 0.1 were selected.
Results: 166 patients with blood samples were included. Mean age was 73 years-old. 39.7% were female. ND occurred in 50 (33%) of patients. 67 patients (33%) died at 3 months.
Regarding metabolomic analysis, PLS-DA showed a good separation between patients with ND or not (**image**). With T-Student, 3 potential metabolites showed FDR of <0.1 and were selected for further validation.



Conclusions: Serum metabolites at the acute phase could aid to identify those patients who are at risk of ND.
Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

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Association between common single nucleotide polymorphisms in microRNA and risk of Ischemic Stroke: A systematic review and meta-analysis

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Background and aims: MicroRNAs (miRNAs) have emerged as potential biomarkers for the diagnosis and differentiation of stroke. Polymorphisms in miRNAs have a significant role in the pathophysiology of ischemic stroke (IS), and their dysregulation can depict disease risk in individuals.
Methods: A comprehensive literature search was performed in various electronic databases, including PubMed, Embase, Cochrane Library, CINAHL, and Google Scholar up to 17th January 2023. Pooled Odds Ratios (ORs) with 95% Confidence Intervals (CIs) helped determine the association. Sensitivity analysis and meta-regression were performed to detect the heterogeneity between studies, and Begg's funnel plot assessed any publication biases.
Results: We identified 25 case-control studies with 10536 IS patients and 13631 control subjects, involving 21 Asian and 4 Caucasian population studies. Our findings indicated a significant association between the polymorphisms of miR-146a [OR=1.57(1.53-1.62], miR-149 [OR=1.60(1.51-1.69)], miR-196a2 [OR=1.39(1.33-1.47)], miR-499 [OR=1.79(1.69-1.90)], and miR-126 [OR=1.91(1.83-2.00)] in the recessive model and the risk of IS. Only miR-499 and miR-126 possessed risk association with IS in all the genetic models. While, miR-146a [OR=0.83(0.80-0.86)], miR-149 [OR=0.90(0.87-0.94)], and miR-196a2 [OR=0.70(0.67-0.74)] showed protective association with IS risk in the dominant model. The heterozygote model of miR-146a polymorphism also correlated with protective association IS risk [OR=0.93(0.90-0.96)]. Subgroup analysis depicted a significant risk association of miR-146a in the Asian [OR=1.58(1.54-1.63)] and Caucasian populations [OR=1.37(1.10-1.70)] in the recessive model.
Conclusions: The results indicated a significant risk association of miR-146a, miR-149, miR-196a2, miR-499, and miR-126 polymorphisms with ischemic stroke. MiRNA polymorphisms can serve as potential biomarkers for IS diagnosis.
Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

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Identification of Vulnerable and Resilient Neuronal Populations after Ischemic Stroke

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Background and aims: Ischemic stroke results in pan-necrosis in the infarct core, though selective cell death is observed in peri-infarct

regions. We used transient middle cerebral artery occlusion (tMCAO) in mice to examine transcriptome changes in the peri-infarct cortex at the single-cell level.

Methods: We performed single-nuclei RNA-sequencing using 10Xchromium v3.1 derived from peri-infarct cortex, and the mirror region on the contralateral hemisphere from 3 tMCAO mice and 3 sham mice. After stringent data cleaning, 150,792 nuclei were obtained with an average of 2624 genes/nuclei, corresponding to 22 clusters, 15 were neuronal clusters (129,533 nuclei). Using the k-nearest neighbor (K-nn) algorithm we identified cluster-specific transcriptionally-related neurons with low density in peri-infarct cortex samples, defined as vulnerable, and conversely, resilient neurons with a high density.

Results: Peri-infarct cortex showed astrogliosis and microgliosis. Differential expression analysis comparing all vulnerable vs resilient neuronal clusters in sham mice were performed and 70 significant genes were common among all the analysis. Vulnerable neurons highly expressed Tafa2, a transcript that has been associated with neuronal survival. In resilient neurons, Gria1 and Gria3 were highly expressed, previously associated with neuroprotection. Gria1 has also been identified as a genome-wide association with early neurological improvement after acute IS in the GENISIS study. Four different replications were performed in mouse and human brain tissue.

Conclusions: We identified 70 genes selectively expressed in resilient and vulnerable excitatory neurons after IS, replicated in different disease models in both mouse and human tissue, suggesting that they promoted resilience/vulnerability across different disease contexts.

Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

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Polygenic burden for cardiovascular risk factors associates with carotid atherosclerosis

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Background and aims: Hypertension, hypercholesterolemia, and diabetes mellitus are major risk factors for carotid atherosclerosis. These factors may already increase the risk of carotid atherosclerosis at subclinical levels. As these risk factors are influenced by genetics, we investigated whether genetic burden for these factors also associates to carotid atherosclerosis, particularly to specific plaque characteristics. Such associations are relevant in the light of evaluating a person's lifetime risk in the context of prevention of atherosclerosis.

Methods: We selected patients from the Plaque-At-RISK-study with genotyped blood samples and carotid imaging. We constructed polygenic scores (PGS) for blood pressure, lipid levels, and fasting glucose which were linked to carotid plaque characteristics (calcification, lipid-rich-necrotic core, intraplaque hemorrhage, plaque ulceration, stenosis degree) using linear and logistics regression. Additionally, we calculated explained variances (R^2-values). All analyses were adjusted for age, sex, and genomic components 1-4.

Results: We included 171 patients (mean age 69±9 years, 73% men). Models including all PGS had higher explained variances for atherosclerosis compared to the base model including age, sex, and principal components only. The highest increase was seen for calcifications (mean R^2=32.3%, Δ=8.5%) and plaque ulceration (14.0%,8.0%). However, most relations were not statistically significant. Further exploration of the individual scores revealed that the added explained variance for the prevalence of specific plaque characteristics varied per kind of PGS.

Conclusions: Genetic burden for traditional cardiovascular risk factors was related to carotid atherosclerosis in symptomatic patients. Additionally, distinct characteristics of carotid atherosclerosis were differentially associated with specific PGS, suggesting different pathophysiological mechanisms.

Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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OUTCOMES OF PERCUTANEOUS ENDOSCOPIC GASTROSCOPY TUBE FEEDING IN DYSPHAGIC STROKE PATIENTS IN A UK DISTRICT GENERAL HOSPITAL

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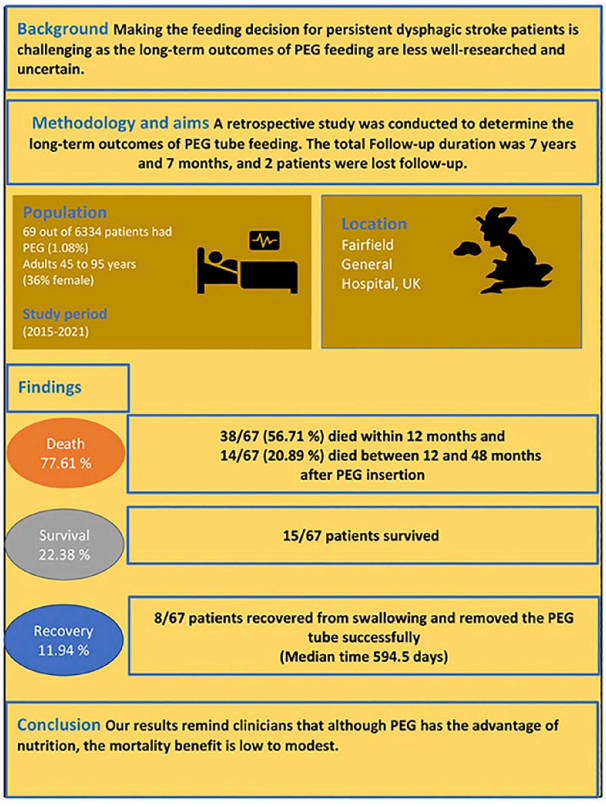
Background and aims: Making feeding decisions for stroke patients with persistent dysphagia imposes a challenge for the multidisciplinary team caring for the patient, including the patient's immediate family. There is limited data on the long-term outcomes of patients who are PEG fed, and as such, we aimed to investigate this.
Methods: A retrospective study was carried out of persistently dysphagic stroke patients who underwent PEG insertion between January 2015 and January 2021 at Fairfield General Hospital in England.
Results: During five years, 6334 people were admitted with strokes, of which 69 (1.08%) underwent PEG insertion. Two patients were discharged to out of areas and were lost during follow-up. Ages ranged from 45 to 95 (36% female). 22/69 (31.88%) patients were discharged to private homes, and 30/69 (43.47%) were discharged to care facilities. At the time of follow-up on the 15th of July 2022, 15/67 patients (22.38%) were alive, and PEG tubes had been successfully removed in 8/67 patients (11.94%) after swallowing recovery (median time 594.5 days). 52/67 (77.61%) patients died during follow-up (total follow-up duration 7 years and 7 months), of which 38/67 (56.71%) died within 12 months, and 14/67 (20.89%) died between 12 to 48 months after PEG insertion. 7/67 (10.44%) were continuing to be PEG fed.



Conclusions: The treating clinician usually takes the main responsibility for making PEG tube insertion decisions based on the best interest of patients. Our results remind clinicians that although PEG has the advantage of nutrition, the mortality benefit is low to modest.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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Antiseizure medications for primary prevention of acute symptomatic seizures after stroke: a systematic review with meta-analysis

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Background and aims: To evaluate the efficacy of antiseizure medications (ASMs) in primary prevention of acute symptomatic seizures (ASS) after stroke (ischemic or haemorrhagic).
Methods: Systematic search of the literature (CENTRAL; MEDLINE; ClinicalTrials.gov) to identify randomized controlled trials (RCTs). Critical appraisal and qualitative synthesis of study results.
Results: We included two placebo-controlled trials (total 114 participants) conducted in haemorrhagic stroke. In one RCT, ASS occurred in 1/ 36 patients (2.7%) with valproate and in 4/36 patients (7%) with placebo (p=0.4). In the other RCT, ASS were electrographic only and occurred in 3/19 (16%) with levetiracetam and in 10/23 (43%) with placebo (p=0.043). Both RCTs were stopped prematurely, including a lower number than initially planned. In the levetitracetam trial, there was an imbalance of baseline characteristics, with higher prevalence of factors possibly associated with ASS.
Conclusions: The evidence on ASMs for primary prevention of post-stroke ASS is limited to intracerebral haemorrhage, of low quality, imprecise, and not enough informative to guide clinical practice. The significant result favouring levetiracetam could reflect imbalance of prognostic factors across groups at baseline. Performing studies with a number of patients lower than initially planned increases the risk of covariate imbalance at baseline and imprecise results. Additional studies are required to evaluate the role of ASMs in preventing post-stroke ASS. It should be clarified whether brief electrographic seizures without any clinical correlate affect functional outcomes and mortality in stroke patients. Finally, it should be evaluated if preventing ASS have antiepileptogenic effects modifying the risk of post-stroke epilepsy.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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BRIDGING THE GAP BETWEEN PRE-AND IN-HOSPITAL SERVICES IN THE STROKE CARE PATHWAY DURING A CLUSTER RANDOMISED TRIAL: A QUALITATVE THEMATIC ANALYSIS

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Background and aims: Although different approaches to improve timely prehospital stroke recognition have been endeavored, challenges remain. The Paramedic Norwegian Acute Stroke Prehospital Project (ParaNASPP), a stepped-wedge cluster-randomised trial, investigated whether an intervention with stroke education for paramedics and the use of the National Institutes of Health Stroke Scale (NIHSS) through a mobile application (eSTROKE), could improve triage and diagnostic accuracy in patients with suspected stroke. The primary objective of the present study was to gain a better understanding of the communication between pre- and in-hospital stroke services by exploring experiences from the trial.
Methods: Semi-structured individual interviews were performed following an interview guide. We recruited informants from the 267 trained intervention paramedics, and stroke physicians at the Stroke Unit, Oslo University Hospital, Norway who participated in the ParaNASPP trial. Interviews were audio recorded, transcribed verbatim and approached inductively using the principles of thematic analysis.
Results: 14 interviews were conducted, with seven paramedics and seven stroke physicians. The data analysis identified four main themes among paramedics and stroke physicians bridging the gap between the pre- and in-hospital stroke services.

1) NIHSS improves prehospital clinical assessment in acute stroke care
2) The eSTROKE model facilitates communication in acute stroke care
3) Collaboration is supported by increased competence and shared understanding
4) The different presentations of acute stroke require both competence and experience

Conclusions: Paramedics and stroke physicians described that the eSTROKE model improved the care pathway for acute stroke by enhanced prehospital competence, establishment of a common language and increased collaboration.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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INTEGRATED STROKE CARE: PROVIDING TOOLS FOR THE EVALUATION OF DIFFERENT PARTS OF THE CARE PATHWAY - A SYSTEMATIC REVIEW

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Background and aims: Management of ischemic stroke (IS) implicates an evidence-based and multidisciplinary approach. However, evaluation of the care process is still a major concern in many European countries. Despite the abundance of guidelines, it remains difficult to translate the enormous amount of recommendations into care pathways (CP). We aim to aid in developing and evaluating CP for patients with IS by giving an overview of the most important recommendations and quality indicators of the CP.
Methods: A systematic literature search was conducted in PubMed, from 2014 to May 2021. Papers were included if they described the entire care process from admission to the emergency department until discharge from a neuro-related ward. In total, 18 papers were included.
Results: In total, 50 recommendations were extracted. These recommendations could be divided into four clinical categories: diagnostic (n=6), therapeutic (n=7), nursing care (n=26), post-stroke rehabilitation (n=8) and structural (n=5). As there is currently a lot of variation on indicator definitions in literature, making uniform comparisons difficult, we formulated indicator definitions for the most important recommendations. And in addition, we provide information on the validity, feasibility and actionability of these indicators in clinical practice.
Conclusions: 18 papers describing recommendations for the care process for IS patients were included in this systematic review. 50 recommendations were extracted, indicating the abundance of information that is available. By providing tools to evaluate the entire or of part of the CP, we give an answer to the current variation in indicators for the evaluation of stroke CP.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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PATIENTS' EXPERIENCES OF PHYSICAL ACTIVITY AND INACTIVITY AT STROKE UNITS IN WESTERN SWEDEN – AN INTERVIEW STUDY

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Background and aims: Observational studies worldwide have shown that patients often are physically inactive when cared for at a stroke unit with reported numbers from 50% to 90% of the day. Physical inactivity at stroke units is associated with higher stroke severity and the organisation of stroke units, although other factors remain unexplored. The aim of the study was to describe patients' experiences of physical activity and inactivity at the stroke unit.

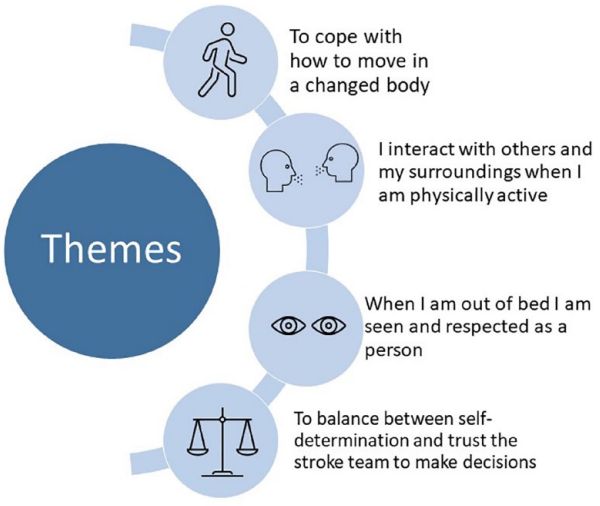

Figure 1. Themes of patients' experiences of physical activity and inactivity at the stroke unit.

Methods: Semi-structured in-depth interviews were made with people with stroke 1-2 weeks after discharge from 8 stroke units. A purposeful selection of participants was made with 16 people with varied age, gender, and stroke severity. Thematic analyses were performed according to Braun and Clarke. Theoretical assumptions were based on Merleau-Ponty´s phenomenology of the body.
Results: Preliminary thematic analysis concludes that the following themes are experienced by people with stroke when they describe their stay at the stroke unit, see Figure 1.
Conclusions: Movement, physical activity, and training are experienced as ways to gain independency after stroke. The challenges are to cope with the changed body, and to trust the stroke team, and yourself when moving. There is an aspiration to be better, to be as before the stroke where training, rest and recovery are needed.
Disclosure of interest: No

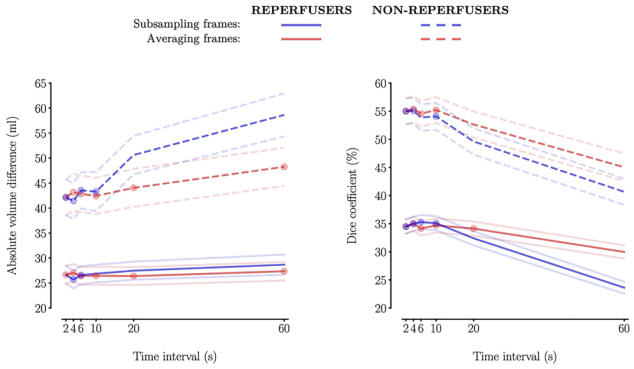

Figure 1: Line plots (mean±standard error) showing the effect of different simulated time intervals on the prediction performance in terms of absolute volume difference and Dice coefficient. When marked with a circle, the performance is non-inferior (p<0.01) compared to the top-ranked method.

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FEASIBILITY OF LOW-DOSE OR CONE-BEAM CT PERFUSION IN ACUTE ISCHEMIC STROKE

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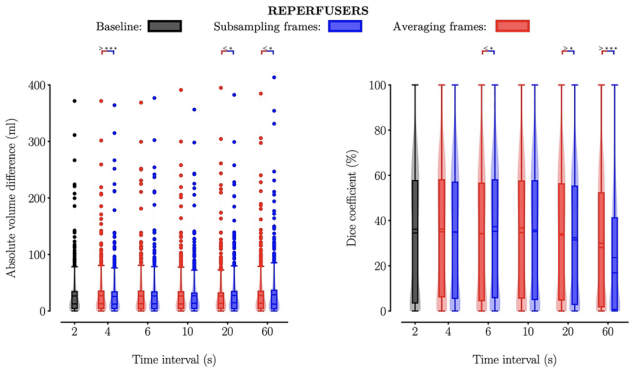

Figure 2: Boxplots showing the distribution of prediction performance in terms of absolute volume difference and Dice coefficient across different simulated time intervals in the group of reperfusers (i.e., infarct core estimation). The performance is statistically compared between subsampling and averaging (p<0.1, p<0.01** and p<0.001***).*

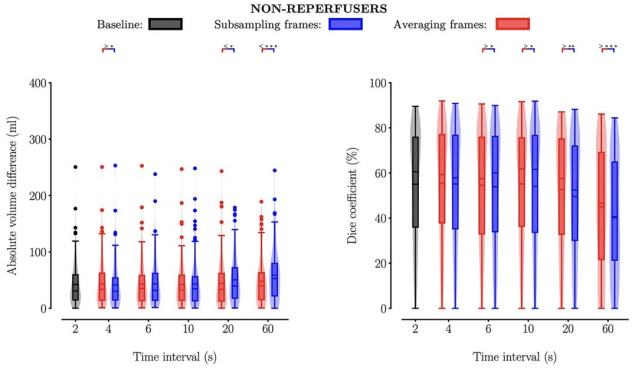

Figure 3: Boxplots showing the distribution of prediction performance in terms of absolute volume difference and Dice coefficient across different simulated time intervals in the group of non-reperfusers (i.e., perfusion lesion estimation). The performance is statistically compared between subsampling and averaging (p<0.1, p<0.01** and p<0.001***).*

Background and aims: CT perfusion (CTP) imaging for acute ischemic stroke (AIS) often relies on deconvolution following repeated imaging with short time intervals. Convolutional neural networks (CNNs) may outperform rCBF- and Tmax-based estimations of core and perfusion lesions. We investigated the robustness of CNNs and the modifying role of increasing time intervals to study the feasibility of low-dose or cone-beam CTP.
Methods: We designed a CNN to predict final tissue status based on CTP imaging and treatment-related information as input in the MRCLEAN (N=188), CRISP (N=107) and a local AIS cohort (N=374). By subsampling or averaging the native CTP frames at 2s, we simulated low-dose or cone-beam CTP datasets, respectively, at 4, 6, 10, 20 and 60s. Using five-fold cross-validation, follow-up segmentation performance was measured by the absolute volume difference (AVD) and Dice coefficient (DSC), and compared using the Wilcoxon signed-rank test ($p<0.01$).
Results: With increasing time intervals to ⩽6s (averaging) or ⩽10s (subsampling), the performance was non-inferior compared to the baseline, and outperformed deconvolution-based estimations (infarct core {rCBF<0.3} in reperfusers (N=499) and perfusion lesion {Tmax>6s} in non-reperfusers (N=119)) with an AVD of 26.6±40.0ml and DSC of 34.5±28.5% in reperfusers, and an AVD of 42.1±39.0ml and DSC of 55.0±25.0% in non-reperfusers. There was a clear trend for a decline of performance at longer time intervals, less pronounced when averaging versus subsampling or estimating core versus perfusion lesion.
Conclusions: Low-dose or cone-beam CTP, simulated by subsampling or averaging the native CTP, respectively, may be considered alternative patient triage solutions.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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Treatment of acute ischemic stroke in patients with active malignancy: Insight from a comprehensive stroke center

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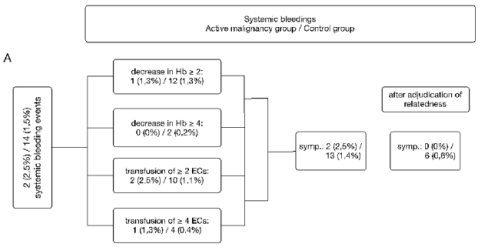
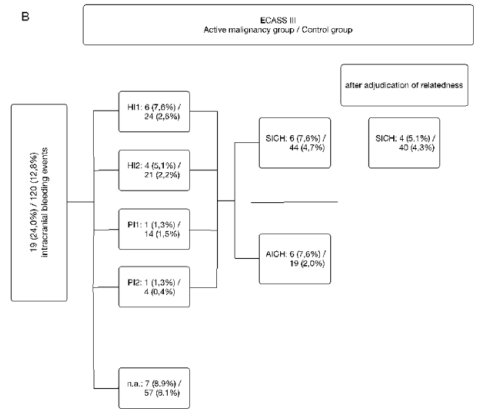
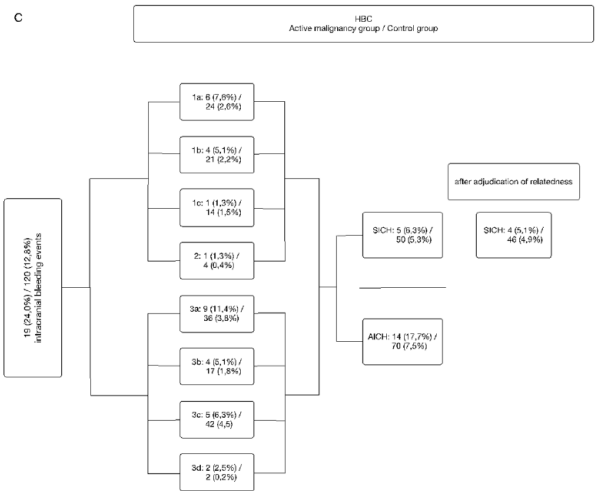
Background and aims: Acute ischemic strokes (AIS) are common in cancer patients due to tumor-specific risk factors in addition to conventional stroke mechanisms. However, there is still no consensus about the safety of recanalization therapies in this cohort. In this observational study, our aim was to investigate the bleeding risk after acute recanalization therapy in AIS patients with active malignancy.

Methods: We retrospectively analyzed data of AIS patients who received intravenous thrombolysis with rtPA (IVT) and/or endovascular therapy (EVT) between 2017 and 2020 with a focus on patients with active malignancy. Primary safety endpoint was the occurrence of treatment-related major bleeding events, i.e., symptomatic intracranial hemorrhage (SICH) and/or relevant systemic bleeding. Primary efficacy endpoint was early neurological improvement (ENI).

Results: 79 of 1016 AIS patients, had active malignancy. None of AIS patients with active malignancy suffered from therapy-related systemic bleeding after recanalization therapy. Rate of therapy related SICH (5.1% vs 4.3%) as well as rate of ENI was comparable between active malignancy group and control group.







Conclusions: Recanalization therapy is not associated with higher risk of systemic bleedings and SICHs in AIS patients with active malignancy and can be regarded as a safe therapy option. The analysis of our large cohort from a comprehensive stroke center located in the university hospital of Germany's largest cancer center is an important contribution to the improvement of clinical decision making in the treatment of AIS patients with cancer.

Systemic (A) and intracranial hemorrhages according to ECASS III (B) and Heidelberg Bleeding Classification (C)

Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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Patient´s description of onset stroke symptoms

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Background and aims: Stroke symptoms vary and could be hard to recognize. In addition, stroke severity has decreased according to the National Institutes of Health Stroke Scale (NISSH), with less pronounced symptoms expression. Knowledge on the patient's description of stroke

symptoms is therefore needed. The aim was to describe patient's symptoms at stroke onset.
Methods: A qualitative content analysis was used. Data were collected through individual interviews with 27 patients (16 men and 11 women, median age 70.4 years). All patients were hospitalized with a first-time stroke. The interviews were conducted within 4 weeks of symptoms onset and before hospital discharge.
Results: All patients had symptoms that affected their daily life. Some patients described having multiple symptoms at the same time, others had symptoms that began insidiously and worsened over time. Symptoms such as overwhelming fatigue or nausea were described as Premonition of becoming ill, feeling unwell or that something was wrong. Motoric bodily changes were multifaceted as slurred speech or dizziness, balance difficulties and losing control of the body or motor dysfunction. But also, that the surroundings were distorted, and solid objects moved around. Symptoms of Dazed and affected senses included confusion and visual impairment or headache.
Conclusions: Stroke is a complex disease with several different symptoms' expressions and could be difficult to recognize, especially when symptoms are less typical or perceived as not serious. Increased awareness of stroke symptoms among caregivers and among members of the community is important and needed.
Disclosure of interest: No

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Inter-hospital Disparity of Acute Ischaemic Stroke Management in Korea: Analysis of the Korean Stroke Registry from 2011 to 2021

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Background and aims: Recanalization therapy plays an essential role in acute stroke treatment. In particular, five trials demonstrating the efficacy of endovascular thrombectomy (EVT) in 2015 and DEFUSE-3 and DAWN trials in 2018 were essential turning points. However, it is not well known how different hospitals apply these treatments. This study aims to analyze the gap in stroke treatment between hospitals using the Korea Stroke Registry (KSR) data.
Methods: We included the data on cerebral infarction and transient ischaemic attack patients of KSR from 2011 to 2021. To investigate the inter-hospital disparities of intravenous thrombolysis (IVT) or EVT, the time taken from a hospital visit to receiving IVT or IAT and the time from a puncture to recanalization time were analyzed. The Gini coefficients were calculated to examine the changing pattern by year.
Results: A total of 166,250 cases were enrolled for 11 years, of which 16,480 patients underwent IVT and 11,629 points underwent EVT. The inter-hospital disparity of door-to-needle time gradually decreases from 2011 to 2021 (Gini coefficient 0.32 to 0.20), but the inter-hospital disparity of door-to-puncture time remains similar. The Gini coefficient of puncture-to-recanalization time was dramatically reduced from 0.73 in 2014 to 0.24 in 2019. The Gini coefficient of stroke in-hospital mortality has also steadily decreased since 2011.
Conclusions: After EVT was implemented in earnest, the inter-hospital disparity of stroke treatment decreased, mainly puncture-to-recanalization time. This might be due to increased proficiency in the in-hospital process and procedure.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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ARE PATIENTS WITH SEVERE STROKE CONSIDERED VEGETABLES?

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Background and aims: In the English language, the offensive term 'vegetable' may be used to describe a person with severe handicap due to stroke or other brain damage, often with the connotation of a 'fate worse than death.' We assessed whether this or a similar term is used more widely across Europe and sought its origin in the English language.
Methods: We performed a survey among stroke physicians in 46 countries in the European Region as defined by the World Health Organization, asking whether patients or family members in their country use a specific ill-defined term to describe a state with severe handicap that is considered unacceptable. We used the Oxford English Dictionary to assess the chronology of the meaning of the word 'vegetable.'
Results: We received responses from 42 countries (91%) reporting on 39 languages. In 27 countries (59%) the term 'vegetable' was used to describe a state with severe handicap and in 15 (31%) the term 'plant' or a specific type of plant. In six (13%) of these countries both terms were used. Six countries (13%) reported no specific vegetable- or other plant-related term. The figurative use of 'vegetable' for "one who is incapable of normal mental or physical activity, especially as a result of brain damage" dates back to at least 1980.
Conclusions: The use of the terms 'vegetable' or 'plant' for a person with severe brain damage is remarkably common across Europe. Considerations will be discussed at the Conference.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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FREQUENCY AND SYMPTOMS OF NON-NEUROLOGICAL AND NEUROLOGICAL STROKE MIMICS IN THE EMERGENCY DEPARTMENT – EXPERIENCES FROM A COMPREHENSIVE STROKE CENTER

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Background and aims: Stroke mimics are common in the neurological emergency department. Underlying aetiologies are heterogeneous and can include serious non-stroke emergencies of neurological or non-neurological origin that require distinct approaches towards diagnosis and treatment. Early detection of such conditions is important to optimize

patient care and utilization of limited resources. Non-neurological stroke mimics are not well studied.
Methods: We conducted a retrospective, cross-sectional study of consecutive patients with suspected stroke transported to the neurological emergency department of the University Hospital Essen between January 2017 and December 2019 by the city's Emergency Medical Service. Patient characteristics, preclinical data, symptoms, further diagnostics, treatment and final diagnosis were registered.
Results: 3154 patients were included in this analysis and 443 (14%) were diagnosed with a stroke mimic. Mimics were non-neurological in 216 (49%) cases, while 227 (51%) were considered neurological. Most common diagnoses were seizures (26%) and infectious diseases (14%). Patients with non-neurological mimics were older (77 vs 73 years), had a higher prevalence of chronic kidney disease (13 vs 7%), heart failure (14 vs 7%), lower prehospital systolic and diastolic blood pressure. Focal symptoms were less common in non-neurological mimics (any focal symptom 41 vs 58%).
Conclusions: Non-neurological conditions can account for up to the half of stroke mimics in the neurological emergency department. Preclinical identification is challenging and focal symptoms are common, justifying transfer for further neurological evaluation.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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QUALITY OF EARLY STROKE CARE AND LONG-TERM MORTALITY IN PATIENTS WITH STROKE – A NATIONWIDE LONG-TERM FOLLOW-UP STUDY

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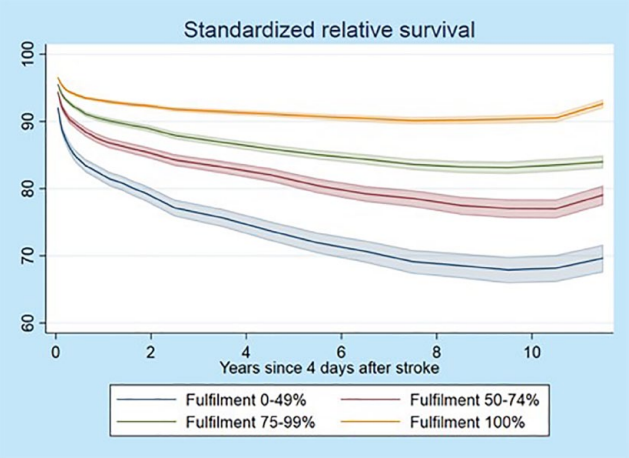
Background and aims: Fulfilment of process performance measures in acute stroke care is associated with lower short-term mortality. However, the potential association with long-term mortality remains to be addressed. The aim of this study was to evaluate the association between fulfilment of process performance measures of acute stroke care and long-term mortality for patients with acute stroke in Denmark.
Methods: We extracted and linked data from Danish health care registers (2008-2018) to identify all patients admitted with first-ever stroke, including intracerebral haemorrhage and ischemic stroke. Quality of acute stroke care was assessed using ten process performance measures. Mortality was compared using Cox proportional hazards ratios, risk ratios computed using Poisson regression, and standardized relative survival.
Results: In total, 93.749 patients were included, corresponding to 8901 cases with intracerebral haemorrhage, 80.597 cases with ischemic stroke, and 4251 cases with unspecified stroke. The median age was 72 years [IQR 62-81] and 46% were women. After 10 years follow-up 55.3% patients had died. The fully adjusted hazards ratios associated with fulfilment of the individual process performance measures ranged from 0.73 to 0.96. The lowest mortality at 10 years follow-up was seen in patients, who had the highest rate of fulfilment, both according to the risk ratios 0.88 and the standardized relative survival 90.51%. The results were confirmed when stratifying for type of stroke.
Conclusions: Higher quality of acute stroke care was associated with substantially lower long-term mortality. Hence, efforts to ensure fulfilment of process performance measures are highly warranted.



Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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Transient visual disturbance: neurological or ophthalmological emergency? Vascular origin in acute transient visual disturbance: A prospective cohort study

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Background and aims: Transient visual disturbance (TVD) is a common complaint caused by a variety of disorders including benign eye pathology, migraine, but also TIA or stroke. Patients seek attention through ophthalmologic emergency departments or TIA clinics. The purpose of the study was to determine the optimal care pathway for patients with TVD.
Methods: A prospective study was conducted in an ophthalmology emergency department and a transient ischemic attack (TIA) clinic. Patients underwent clinical evaluation including a tailored questionnaire, brain, vascular, and full ophthalmologic investigations, and 3-month follow-up. TVDs were classified according to vascular or nonvascular origin by three independent experts based on clinical, cerebrovascular, and ophthalmologic investigations, but blind to the questionnaire results.
Results: Of 407 screened patients, 279 were included and analyzed. Of them 36% (100/279) had a vascular origin. Of the rest 64% of non-vascular origin, 35% were finally diagnosed with migraine aura and only 11% (30/276) were pure ophthalmological causes. Of these 30 patients with ophthalmological cause, only 5 patients needed rapid ophthalmological treatment, which represented 2% of all patients and 4 patients already had an ophthalmic history prior to the index event. When we look at patients

with vascular origin, 25 patients had a stroke and 16 had a significant arterial stenosis, which represented 9% and 6%, respectively of all patients.
Conclusions: Patients with transient visual disturbance should be first addressed to a TIA clinic to rule out TIA or stroke. Ophthalmologic evaluation, when not readily available, should not delay the neurovascular evaluation. (ClinicalTrials.gov NCT02485054)
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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Meta-analytic methods for synthesizing evidence across explanatory and pragmatic trials

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Background and aims: Random effects (RE) models are commonly used for synthesizing evidence from multiple clinical trials but may be less accurate for estimating pooled treatment effects when there is substantial heterogeneity due to differences in trial design and implementation. This study examined methods for synthesizing evidence from explanatory and pragmatic trials.
Methods: Computer simulation was used to compare RE, RE based on t-distribution (tRE), and mixture RE (MRE) models for synthesizing evidence from pragmatic and explanatory RCTs. Investigated simulation conditions include distribution of treatment effect size, number of trials, and mixing proportion. Relative bias and between-study variance were used to assess model performance. Data from a review of 29 endovascular thrombectomy acute stroke trials were used to illustrate these models for estimating pooled Endovascular Treatment (EVT) effect.
Results: Of the 29 trials included in the review, 4 (13.9%) studies were rated as pragmatic trials. The pooled treatment effect sizes based on RE, tRE, and MRE models were 1.54 (95%CI = [1.29 – 1.84]), 1.47(95%CI = [1.24 - 1.79]), and 1.45 (95%CI = [1.23 – 1.76]), respectively. The estimated between-study variances were 0.20, 0.14, and 0.12, respectively. Computer simulation show that MRE and tRE exhibited lower average relative bias and average relative between-study variances than the RE model as the proportion of pragmatic trials decreased.
Conclusions: Ignoring heterogeneity due to differences in trial design when pooling evidence from multiple trials can result in biased pooled treatment effects. Meta-analytic methods that compensate for heterogeneity due to trial design features are recommended.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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Impairment of spatial discrimination sensory function in patients with cerebellar infarction: Evidence of cerebellar contribution to sensory function

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Background and aims: We aimed to establish whether the spatial discrimination function is impaired in cerebellar infarction patients.
Methods: The patients with unilateral acute cerebellar infarction confirmed by diffusion-weighted brain MRI were included. The subjects who had somatosensory or cognitive dysfunction were excluded. As controls, age-matched healthy volunteers were included. Spatial discrimination was evaluated with the commercially available Grating Orientation Task using a set of eleven hemispheric plastic Johnson-Van Boven-Philips (JVP) domes, which have ridges and grooves of varying widths (from 0.5 mm to 4.5 mm). The grating orientation threshold (GRT) is defined as the dome in which the subject achieves an accurate response rate of 75% or more. Subjects who were unable to reach the upper threshold of 4.5mm or lower threshold of 0.5 mm were considered to have an arbitrary threshold at 5.0 mm or 0.35 mm.
Results: The study subjects were 24 patients (16 men; mean age, 65.5 $\pm$14.0 years) and 24 age-matched healthy controls (11 men; mean age 61.9$\pm$10.5 years). In control subjects, GRT was comparable between the dominant (2.10$\pm$0.86) and non-dominant hands (2.23$\pm$0.92). In stroke patients, GRT was not statistically different between the ipsilateral side to the ischemic lesion (3.22$\pm$1.42) and the contralateral side (3.10$\pm$1.40). Therefore, we used the mean GRT of both hands for further analyses. GRT was significantly impaired in stroke patients compared to the controls ($P<0.001$).
Conclusions: Tactile discrimination function was impaired in patients with unilateral cerebellar infarction. It supports the role of the cerebellum in the sensory pathway.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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PERFORMANCE OF STRATIFICATION SCORES ON THE RISK OF STROKE AFTER A TRANSIENT ISCHEMIC ATTACK: A SYSTEMATIC REVIEW AND NETWORK META-ANALYSIS

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Background and aims: Several scores have been developed to stratify the risk for stroke following a transient ischemic attack (TIA). However, it's unclear which score has the best performance given the paucity of direct comparisons.
Methods: We performed a systematic review and network meta-analysis to compare available TIA scores in predicting risk for stroke within 90 days. We included studies providing at least one direct comparison between scores for the same population. For each score we identified the optimal threshold and then estimated the relative performance at the optimal threshold of each score by using evidence from both direct and indirect comparisons.
Results: We identified 6 publications providing data from 8217 patients recruited in 13 discrete cohorts. The performance of all scores was low, even at their optimal thresholds: ABCD$\geqslant$4 (sensitivity: 64%, specificity 0.62; Figure 1A), ABCD2$\geqslant$4 (sensitivity: 59%, specificity 0.62; Figure 1B), ABCD3-I$\geqslant$7 (sensitivity: 53%, specificity: 68%; Figure 1C), California score$\geqslant$2 (sensitivity: 63%, specificity: 59%; Figure 1D), ESRS$\geqslant$3 (sensitivity: 62%, specificity: 72%) and SPI-II$\geqslant$6 (sensitivity: 48%, specificity: 64%).

Relative sensitivities and specificities, using ABCD as the common comparator (Figure 2), suggested no significant differences in the tests performance.
Conclusions: The utilities of existing scores in identifying individuals who will have a stroke within 90 days after a TIA are comparable and poor. Development of new scores is needed to reliably stratify the risk of stroke within the first 90 days following a TIA.

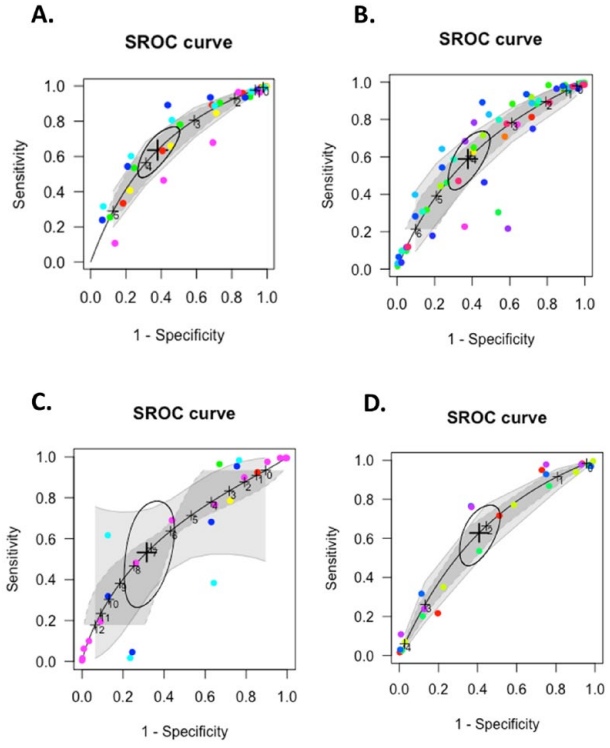

Figure 1.

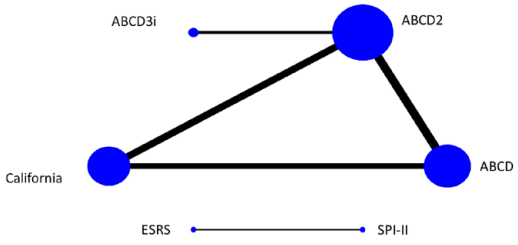

Figure 2.

Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

1242

Identifying the unmet needs of young people with stroke who have communication or cognitive impairment

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Background and aims: Young survivors of stroke (YSS) with communication or cognitive impairments have poorer outcomes than YSS without such impairments. We previously established the Unmet Needs Screening Tool. Here we sought feedback from YSS on a communication accessible version.
Methods: We amended the tool using best practice principles for communication accessibility (including images and plain language) and cognitive strategies. The tool includes six domains (Body and Mind, Emotions, Information, Daily Life, Relationships, Social) covering 53 potential needs, and a distress thermometer.
Via online interview, YSS with cognitive or language impairments completed the tool and provided feedback on its content and usability. Data collected: demographics, stroke details, communicative activity limitation (Australian Therapy Outcome Measures), self-reported cognitive difficulties.
Results: 20 YSS (24-53yrs, 60% cognitive difficulties, 80% mild to moderate-severe language limitation) participated, with support from 10 carers.
Respondents on average reported high distress (median 5, IQR 1.5 – 7). All had at least one unmet need related to "body and mind" (particularly speech/ communication (75%), fatigue (70%) and memory/ thinking (65%)) and most had needs in all domains. Face to face appointments was most preferred across all domains, followed by group discussion, and podcast/ video by a professional.
Use of the tool was strongly endorsed. Respondents suggested the tool should be used early after stroke, prior to transitions, and at regular intervals to accommodate changing needs.
Conclusions: This tool could be used by YSS with cognitive and/or communication difficulties, with informal assistance as needed, to identify care pathway requirements and support recovery.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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Prevalence and phenotype of dysphagia in cerebellar ischemic stroke

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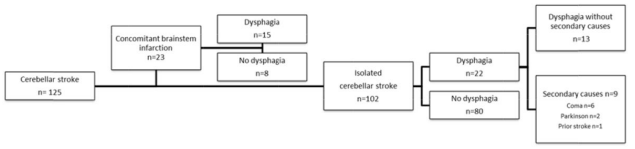
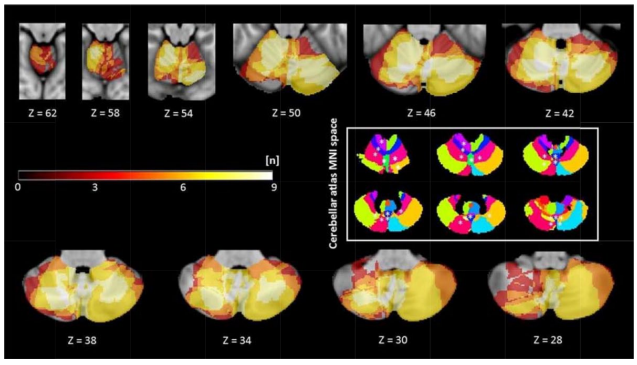
Background and aims: Dysphagia constitutes a common symptom of acute ischemic stroke with variable prevalence, severity and prognosis depending on stroke location. Only limited data are available on dysphagia frequency and patterns after cerebellar stroke. We aimed to systematically investigate presence and severity of dysphagia in this stroke subtype.
Methods: We performed a retrospective analysis of consecutive cerebellar ischemic stroke cases admitted to a German university hospital. Groups were defined according to presence of dysphagia and brainstem involvement. Videos of fiberoptic endoscopic evaluation of swallowing (FEES) examinations were analyzed to determine dysphagia prevalence and phenotype. Brain imaging was used to identify lesion size and location associated with dysphagia.

Results: Between January 2016 and December 2021, 125 patients were included. N=102 had isolated cerebellar and n=23 concomitant brainstem infarction. After exclusion due to secondary causes, n=13 (12.7%) showed cerebellar stroke-associated dysphagia (figure 1). Mapping the lesions of these patients revealed increased overlap in vermis and paravermal areas on the left (figure 2). Infarct volume correlated with dysphagia severity on the functional oral intake scale (ρ = -0.32; P=0.001). FEES most commonly demonstrated premature bolus spillage (81.8%), followed by valleculae epiglotticae residues (54.6%).
Conclusions: Although the cerebellum plays a vital role in the execution of swallowing, our data show a lower prevalence of dysphagia compared to other lesion locations. Some, but not all cases of dysphagia could be explained by altered level of consciousness or brainstem lesions. Conceivably, only strategic or larger lesions within the cerebellum interfere with the complex swallowing network.





Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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ANALYSIS OF MEDICAL ENTERAL NUTRITION'S USEFULLNESS OF ACUTE STROKE PATIENTS IN A HUNGARIAN STROKE CENTER

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Background and aims: 30-50% of acute stroke patients(ASPs) suffer from dysphagia. These patients have a higher risk for dehydration, malnutrition, aspiration pneumonia, muscle breakdown, sarcopenia, pressure ulcer. Their nursing time is prolonged, prognosis is worse, mortality is higher. However, the usefulness of medical enteral nutrition(MET) is not sufficiently known. It is necessary to know the number and characteristics of patients with dysphagia.
Methods: We analyzed the data of stroke patients treated at our department in 2010 and 2018. MET protocol (based on ESPEN guideline) was introduced in 2015 and was not used previously. We compared the patients' total hospital stay (PTHS), antibiotic use(AU) and the cost of MET during the all year. We analyzed separately the data of Novembers of both years examing the incidence a stroke associated pneumonia(SAP) as a marker of complication of dysphagia, the age and neurological state of patients, latter by NIHSS values.
Results: In 2018 the average of PTHS decreased from 43.07 to 35.04, antibiotic use from 1.504.753 to 912.259 Hungarian Forints, the daily devided dose of AU from 13.79 to 10.60. The rate of SAP in November 2010 was 17.95% and it decreased to 9.34%. At the same period NIHSS value increased from 6.4 to 11.3, the average age from 73.8 to 76.06 years.
Conclusions: Our analysis proved, that MET is not only useful for the ASPs, but cost-effective method supplementing the conventional drug medication. The number of complications of dysphagia decreased remarcable while the age of patients became higher, the state more serious.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

1300

Outcomes and Quality of Care Amongst In-Hospital Strokes

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Background and aims: In-hospital stroke (IHS) occurs in a patient originally admitted to hospital for another diagnosis/procedure. IHS reflects a clinically distinct cohort to community-onset stroke (COS).
Methods: Data from an Irish university teaching hospital was retrospectively reviewed from January 2020 to December 2021. Proportional data of key performance indices were compared used Chi Square statistics.
Results: During the 2-year period, the rate of IHS was 15.7%. Median age of IHS (n=85) and COS (n=456) cohorts were 73 years and 72 years respectively. The proportion of ischaemic stroke was significantly higher in IHS than COS (99% versus 86%; p=0.0009). Proportion of patients with no disability pre-stroke was higher amongst COS (48%) than IHS (29%) (p=0.002). Amongst IHS cases, cardiovascular conditions (39%) were the most recorded primary diagnosis, limb weakness the most common symptom (47%) and 40% were recognised by a doctor.
The proportion of IHS receiving thrombectomy was higher (10% versus 7% of COS) but not statistically significant (p=0.35). When compared to COS, IHS were less likely to be under the stroke team (22% versus 71%; $p<0.0001$), admitted to the stroke unit (41% versus 80%;$p<0.0001$), receive swallow screening (49% versus 77%; $p<0.0001$), and be discharged home (52% versus 64%; p=0.03). Fifteen percent of IHS died compared to 11% of COS (p=0.2). Having no/mild disability at discharge was more likely in COS than IHS (62% versus 45%,p=0.003).
Conclusions: Priority areas for improvement in IHS include rates for stroke unit admission and swallow assessment, as well as pathways to facilitate discharge home.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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Suboptimal anticoagulation management precedes the majority of ischaemic strokes in patients with known AF and/or mechanical valve(s)

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Background and aims: Anticoagulation is key in reducing cardioembolic stroke risk in atrial fibrillation (AF) and/or mechanical valve (MV). Suboptimal use of anticoagulants for stroke prevention is common. We assessed the rate of suboptimal anticoagulant management in patients admitted with ischemic stroke.

Methods: We performed a prospective, multi-centre observational study in Australia of patients admitted with ischemic stroke and previously known AF or mechanical heart valve(s) between Jan 2019 and September 2022. We determined optimal anticoagulation management, in the two weeks prior to the index stroke, against the 2021 European Heart Rhythm Association recommended practical guidelines for indications, dose and adherence.

Results: A total of 393 patients (81 years, IQR: 73-88; 39% females) with ischemic stroke, AF (95%) and/or mechanical heart valve(s) (5%) were enrolled for analysis. Suboptimal management were present in 212 of 393 patients (54%, 95% CI: 49%–59%). Sex (p=0.18), age (means:80 years, p=0.96) and CHADS2-VASC scores (mean:4.3 vs 4.2, p=0.57) were similar between patients with or without suboptimal management. In patients with suboptimal management, 73/212 (34%) were not prescribed any anticoagulation despite apparent indication, 44/212 (21%) were self-reportedly not adherent to medications and 26/212 (12%) had sub-therapeutic doses. There was no difference in the rate of anti-coagulation mismanagement between hospitals (p=0.39). (Table 1.)

Conclusions: Suboptimal management of anticoagulants is present in the majority of patients with, known AF and/or mechanical heart valve(s) in the 2 weeks preceding acute ischemic stroke. Improving anticoagulation practices has the potential to substantially reduce the risk of stroke in high-risk patients.

Disclosure of interest: No

Total no. of patients: 393	No. (%)			P value
Measure	Overall	Issues present	No issues	
Age, Median (IQR), y	81 (73-88)	80	80	0.96
Sex				
Male	240 (61)	126 (53)	114 (47)	0.21
Female	153 (39)	90 (59)	63 (41)	
Anti-coagulation Indication				
Atrial Fibrillation	375 (95)	199 (53)	176 (47)	*0.036*
Mechanical Heart Valve	18 (5)	5 (28)	13 (72)	
$CHADS_2$-VASC (mean)	4.2	4.2	4.3	0.57
3 most common issues in 212 of 393 patients identified				
Not prescribed	73/212 (34)			
Non-adherence	44/212 (21)			
Subtherapeutic dosing	26/212 (12)			
Inter-Hospital Comparison				
Austin Hospital	254 (65)	134 (53)	120 (47)	0.39
Box Hill Hospital	31 (8)	20 (65)	11(35)	
Fiona Stanley Hospital	108 (27)	62 (57)	46 (43)	

Table 1. Patient characteristics and results

CLINICAL PRACTICE, MANAGEMENT AND CARE

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EFFECT OF EYES-OPEN AND EYES-CLOSED STATES ON SUBHAIRLINE ELECTROENCEPHALOGRAPHY-BASED LARGE VESSEL OCCLUSION STROKE DETECTION

Eva Groenendijk*[1,2], Maritta van Stigt[1,2], Anita van de Munckhof[2], Henk Marquering[3,4], Hans Koelman[1], Wouter Potters[2,5], Jonathan Coutinho[2]

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Background and aims: Electroencephalography (EEG) is potentially valuable as prehospital triage method for anterior circulation large vessel occlusion (LVO-a) stroke. Eyes-open and eyes-closed states affect EEG, but it is not known whether patients should keep their eyes open or closed for optimal EEG-based LVO-a stroke detection. In this pilot study, we determined the effect of eyes-open and eyes-closed states on subhairline EEG-based LVO-a stroke detection.

Methods: A 3-minute EEG recording was performed in patients suspected of stroke using 9 self-adhesive electrodes placed on the forehead and behind the ears. Patients kept their eyes closed the first half of the recording and open the second. We determined the area under the receiver operating characteristic curve (AUC) of EEG features quantifying frequency band power (relative delta, theta, alpha and lower beta powers and power ratios) and brain symmetry (pairwise derived Brain Symmetry Index [pdBSI]).

Results: Three of 13 (23%) included patients had an LVO-a stroke, 7/13 (54%) a non-LVO-a ischemic stroke, 1/13 (8%) a TIA and 2/13 (15%) a stroke mimic. Median age was 74 (IQR 72-81) years, 7/13 (54%) patients were female and median symptom-onset-to-EEG time 349 (IQR 124-528) minutes. The diagnostic accuracy for eyes-open and eyes-closed states differed most for the relative theta power (AUC 0.53 vs. 0.77, respectively) and the pdBSI in the alpha frequency band (AUC 0.88 vs. 0.58, respectively).

Conclusions: In these pilot data, eyes-open or eyes-closed state affected EEG-based LVO-a stroke detection, resulting in higher or lower diagnostic accuracy depending on the evaluated EEG feature.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

1422

DETECTION OF ACUTE LARGE AND MEDIUM VESSEL OCCLUSION STROKE WITH ELECTROENCEPHALOGRAPHY

Maritta van Stigt*[1], Eva Groenendijk[1], Laura van Meenen[2], Anita van de Munckhof[2], Monique Theunissen[3], Gaby Franschman[3], Martin Smeekes[4], Joffry van Grondelle[5], Geertje Geuzebroek[5], Arjen Siegers[5], Marieke Visser[2], Sander van Schaik[6], Patricia Halkes[7], Charles Majoie[8], Yvo Roos[2], Hans Koelman[1], Miou Koopman[8], Henk Marquering[8,9], Wouter Potters[2,10], Jonathan Coutinho[2]
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Background and aims: Endovascular thrombectomy (EVT) is standard treatment for anterior circulation large vessel occlusion (LVO-a) stroke and increasingly considered for anterior circulation medium vessel occlusion (MeVO-a) stroke. We evaluated the diagnostic accuracy of dry electrode electroencephalography (EEG) for LVO-a and MeVO-a stroke detection.
Methods: We performed dry electrode EEG recordings, using electrodes covering the vascular territory of the middle cerebral artery, in suspected stroke patients in the prehospital setting and emergency room, before EVT. Diagnostic accuracies of frequency band power and the pairwise derived Brain Symmetry Index (pdBSI) for detection of LVO-a stroke (intracranial ICA, A1, M1, proximal M2 occlusion on CT angiography) and LVO-a and MeVO-a stroke (distal M2, M3, A2, A3 occlusion on CT angiography) combined were evaluated using receiver operating characteristic curves. Sensitivity was determined at a specificity ⩾80%.
Results: EEG data were available for 354 patients. Median age was 73 (IQR 64-81) years, 145/354 (41%) were women, and median baseline NIHSS was 2 (IQR 0-5). Twenty-four/354 (7%) patients had an LVO-a stroke, 16/354 (5%) a MeVO-a stroke, 161/354 (45%) a more distal or posterior ischemic stroke, 45/354 (13%) a TIA, 11/354 (3%) a hemorrhagic stroke, and 97/354 (27%) a stroke mimic. Diagnostic accuracy for LVO-a stroke was highest for the pdBSI (AUC:0.74 [95% CI:0.61-0.86]; sensitivity:43% [95% CI:24%-63%]; specificity:85% [95% CI:80%-89%]). LVO-a and MeVO-a stroke combined were also best predicted by the pdBSI (AUC:0.71 [95% CI:0.61-0.82]; sensitivity:38% [95% CI:23%-55%]; specificity:84% [95% CI:79%-88%]).
Conclusions: EEG has moderate diagnostic accuracy for LVO-a and MeVO-a stroke detection.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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COMPARISON OF THE NEW CANADIAN SCORE TO ABCD2 FOR TIA RISK STRATIFICATION IN A COMMON CLINICAL SETTING: an update

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Background and aims: After a TIA, patients are at high risk of subsequent stroke, especially in the short term. The degree of risk is usually determined using clinical scores, although over the past few years, various recommendations have been proposed to identify patients for hospitalisation after TIA. The most widely used is the ABCD2 score, however a new score (Canadian TIA Score, CTS) has been recently proposed, which may be better in terms of prediction and sensitivity, by including more variables both clinical and instrumental (Figure 1).
Methods: We retrospectively analysed prospectively collected data from our two Stroke Units registry from 2018 to 2021. We recalculated ABCD2 and de novo calculated CTS for each patient. Then we compared the two scores both with Spearman's rank correlation and Cohen's Kappa, using commonly defined cut-off points (4 for both scores that would be used to decide on the patients' admission).
Results: Patients were 180. Median ABCD2 was 4, median CTS was 7. Spearman's rank correlation was 0.61 (95%IC 0.5-0.7, p<0,001), whereas Kappa was 0.23 (fair agreement) (Figures 2,3).
Conclusions: The two scores are optimally correlated and moderately reproducible. Since the decision to admit patients is usually based on both scores and other information (included in the CTS, but not ABCD2), we propose to compare common clinical practice (including the ABCD2) with the CTS, which may seem less practical to use in emergency settings, although this limitation can be easily overcome through online calculators or smartphone apps.

ABCD² SCORE	Points
Age ≥ 60 years	1
Blood pressure ≥ 140/90 mmHg at initial evaluation	1
Clinical features of the TIA	
speech disturbance without weakness or	1
unilateral weakness	2
Duration of symptoms	
1-59 min or	1
> 60 min	2
Diabetes mellitus in patient's history	1
TOTAL SCORE (0 to 7)	

SCORE	2day-stroke risk	Recurrence within 90 days
0-3	Low	1.0%
4-5	Moderate	4.1%
6-7	High	8.1%

CANADIAN TIA SCORE	Points
Clinical findings	
first transient ischaemic attack (in lifetime)	2
symptoms ≥ 10 minutes	2
past history of carotid stenosis	2
already on antiplatelet therapy	3
history of gait disturbance	1
history of unilaterale weakness	1
history of vertigo	-3
initial triage diastolic blood pressure ≥ 110 mmHg	3
dysarthria or aphasia (history or examination)	1
Investigations in emergency departement	
atrial fibrillation on electrocardiogram	2
infarction (new or old) on computed tomography	1
platelet count ≥ 400 x 10^9/L	2
glucose ≥ 15 mmol/L	3
TOTAL SCORE (-3 to 23)	

Figure 1.

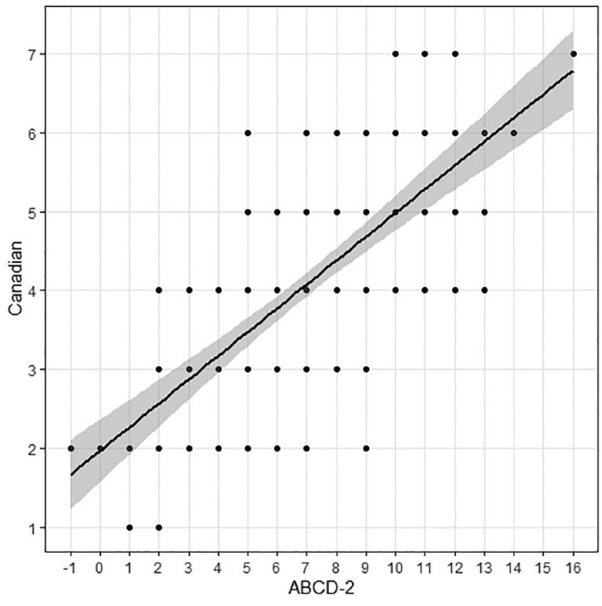

Figure 2.

	CTS < 4	CTS =>4
ABCD2 < 4	13	44
ABCD2 =>4	2	121

Figure 3.

Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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Clinical presentation in patients with posterior circulation stroke and mild symptoms

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Background and aims: Patients with posterior circulation ischemic stroke and low National Institutes of Health Stroke (NIHSS) may present with signs/symptoms not represented in the NIHSS. We investigated the prevalence of non-NIHSS signs/symptoms and their association with the site of the ischemic lesion on follow-up imaging.

Methods: Clinical data of consecutive posterior circulation ischemic stroke patients presenting with NIHSS<=5 were retrospectively analysed from the Basilar Artery Treatment and Management (BATMAN) registry. Clinical features and NIHSS were assessed within 24 hours after symptom onset. Lesion location was centrally reviewed by investigators blinded to clinical data and was dichotomized into infratentorial and supratentorial.

Results: We included 225 patients, mean age(±SD) 65 years(±15.8), median(IQR) NIHSS 2(1-4). The most frequent non-NIHSS signs/symptoms were gait ataxia (50%), vertigo (44%), nausea/vomiting (37%) and nystagmus (30%); 32(14%) patients presented with only one non-NIHSS sign/symptom, of which the most frequent were gait ataxia (34%), headache (22%) and vertigo (16%); 45(20%) patients had NIHSS=0 and most frequently presented with gait ataxia (57%), nausea/vomiting (43%) and nystagmus (36%). Gait ataxia (63%), vertigo (48%) and nausea/vomiting (42%) were the most common non-NIHSS signs/symptoms in patients with infratentorial lesions, whereas vertigo and headache(15%) were frequent in those with supratentorial lesions.

Conclusions: Posterior circulation ischemic stroke presenting with low NIHSS may have signs/symptoms such as gait ataxia, vertigo, nausea/vomiting and nystagmus not measured by NIHSS. Approximately one fifth of the patients presented with NIHSS=0 but other detectable symptoms/signs. Our results may inform clinicians and improve early diagnosis of stroke in the posterior circulation.

Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

2490

Identification of occult lung cancer during and after hospitalization for stroke

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Background and aims: Lung cancer is the commonest cancer in stroke. The frequency with which it is identified during hospitalization and the weight risk of lung cancer should be given when organizing the stroke work-up on admission is not known. We studied rates of identification of occult lung cancer in the first year after stroke in Danish stroke patients compared to the background population without stroke.

Methods: All patients ⩾40 years of age with incident stroke in Denmark 2003-2015 were identified through the Danish Stroke Registry (n=85,893) and matched 1:10 on age and sex to the Danish background population without a history of stroke (n=858,740). Linking data to the Danish Cancer Registry we identified occult primary lung cancer defined as previously unknown lung cancer during a one-year follow-up in the stroke and background population.

Results: During the first month after stroke when patients are in hospital identification rates of occult lung cancer were 17.7/1,000 person-years and 2.7/1,000 person-years in the background population: 6.6 times higher in the stroke population. In the 4th-12th month after stroke when most patients are discharged from hospital identification rates were 3.2/1,000 person-years in the stroke population vs 2.5/1,000 person-years in the background population: 1.3 times higher in the stroke population.

Conclusions: During hospitalization for stroke occult lung cancer was identified and became manifest seven times more often than in the age and sex matched background population without stroke. There is good reason, therefore, to include this high risk when organizing a stroke work-up.

Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

2639

CHANGES IN STATIN PRESCRIBING BEHAVIORS FOLLOWING INCIDENTALLY-DISCOVERED COVERT CEREBROVASCULAR DISEASE: A RETROSPECTIVE COHORT IN A LARGE EHR IDENTIFIED USING NATURAL LANGUAGE PROCESSING

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Background and aims: Incidentally-discovered covert cerebrovascular diseases (id-CCD) including covert brain infarcts (CBI) and white matter disease (WMD) are associated with future stroke and dementia. There are no guidelines for prevention when these are discovered. Qualitative studies suggest high variability in how clinicians approach management of id-CCD, including prescribing medications such as statins. We sought to assess current practices for id-CCD in a large real-world cohort.
Methods: In patients age ⩾50 in the Kaiser Permanente-Southern California health system with head CT or MRI from 2009-2019 and no prior history of ischemic stroke, TIA, or dementia, we used a natural language processing algorithm to identify patients with CBI and WMD on the index neuroimage. We used robust Poisson multivariable regression to assess changes in statin prescription rates among patients without statin prescription during the 6 months before the index scan to the 6 months following the scan, adjusting for indication for statin prescription.
Results: Among 241,050 patients, id-CCD was detected in 74,975 patients (31.1%) with 4.7% having CBI and 29.0% having WMD. Among patients without statins in the 6 months prior to index scans, statins were prescribed for 9,780 (9.3%) patients without and 4,820 (12.0%) patients with id-CCD. In adjusted analyses, presence of CBI or WMD was associated with slightly increased statin prescription (RR 1.09, 95%CI 1.05-1.13), presence of CBI with mildly increased prescription (RR 1.24, 95%CI 1.16-1.33), and WMD with slightly increased prescription (RR 1.04, 95%CI 1.002-1.08).
Conclusions: id-CCD is not associated with substantial changes in statin prescribing practices.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

2655

THE EFFECTS OF POSTURE ON CEREBRAL BLOOD VELOCITY IN ACUTE STROKE

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Background and aims: Earlier and more frequent out-of-bed stroke rehabilitation (mobilisation) may increase the odds of a poor neurological recovery. It is plausible that regular reductions in cerebral perfusion induced by orthostatic stress may contribute to an impaired recovery. To date, no studies have assessed how standing up affects cerebral haemodynamics in acute stroke. The aim of this study is to investigate the effects of mobilisation (standing) on cerebral blood velocity in acute stroke.
Methods: 32 participants (mean [SD]: age 79.4 [21] years; BMI 26.6 [5.4] kg/m^2; NIHSS 5.5 [3.4]; 3.4 [1.67] days post-stroke; 94% ischaemic, 6% haemorrhagic stroke) were recruited from a hyper acute stroke unit in Sheffield, UK. Middle cerebral artery blood velocity (MCAV) was measured bilaterally using 2MHz transcranial Doppler ultrasound probes secured with a headset (Sonara, Viasys, US). MCAV was recorded for five minutes in a supine position (baseline) and for three minutes whilst standing. For our preliminary analysis, a paired samples t-test was used to compare differences in MCAV between supine and standing.
Results: Our preliminary analysis (n=16) demonstrates that standing causes a sustained ~8% (3cm/s) reduction (p=0.002) in MCAV in the ipsilateral hemisphere. MCAV in the contralateral hemisphere was not significantly different after standing (p=0.1).
We will report results from the analysis of our full dataset, alongside correlations between clinical data (e.g. stroke severity, anti-hypertensive drug usage, and three-month functional independence) and the MCAV response to mobilisation.
Conclusions: This study provides mechanistic insight into the cerebral haemodynamic response to mobilisation early after stroke.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

1085

1-year outcome of mechanical thrombectomy in patients with cancer-related acute ischemic stroke in the Krakow Comprehensive Stroke Center in Poland

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Background and aims: Cancer is a risk factor of acute ischemic stroke (AIS). The 1-year effectiveness of mechanical thrombectomy (MT) in cancer related stroke (CRS) was not studied systematically.
Methods: We studied 1-year outcome of CRS (diagnosis of cancer within 5 years before stroke) as compared to AIS patients without CRS treated with MT admitted to the Comprehensive Stroke Center at the University Hospital in Krakow, between 2019-2021. We studied 49 parameters readily available within 24 hours after AIS including demographics, stroke risk factors, intravenous thrombolysis (IVT) and several clinical and biochemical parameters. Outcome measure was the modified Rankin score (mRS) at 1-year after stroke. mRS ⩽ 2 defined good outcome and mRS=6 death.
Results: During a study we registered 2554 AIS patients. 1788 (70%) patients agreed to participate, 593 of them (33,2%) received MT, 325 of them (54,8%) received IVT proceeded MT. 1-year follow-up was available for 562 (94,77%) patients. 35 patients with SRC as compared to others (n=527) had significantly less often IVT before MT (22,2% vs 59,5%, p=0.000012); higher levels of fibrinogen and lower levels of HB or HDL or lower while blood cells count (p<0.05). 1-year mortality was significantly higher in SRC patients (48.8% vs 29,5%, p=0.018), however 1-year

good outcome was noted in 48.6% SRC patients as compared to 61.5% of others (p=0.13).
Conclusions: MT in CRS seems to be effective in a 1-year follow up. Although the 1-year mortality is significantly higher in CRS, most CRS patients who survived 1-year present with good outcome.
Disclosure of interest: Yes

CLINICAL PRACTICE, MANAGEMENT AND CARE

1674

SCREENING PROTOCOL OF GROIN COMPLICATIONS AFTER ENDOVASCULAR PROCEDURE IN STROKE PATIENTS. DESIGN AND APPLICATION IN A STROKE UNIT

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Background and aims: Femoral artery access site complications are uncommon but raising with the increasingly frequent use of endovascular procedures (EP) in stroke patients. This study aims to describe the application and results of a systematic groin surveillance protocol including physical exam and ultrasonography lead by a stroke unit nurse team.
Methods: Prospective observational single-center study. The screening protocol included physical examination, hematoma, lump, local pain and leg arterial pulses, and ultrasonography with longitudinal and axial scans of the artery. Each patient was assessed by two investigators independently and within 7 days after the EP. If abnormalities were found, a regular ultrasonography was performed by a radiologist. Patients underwent a 3-month follow-up to check for potential local complications.
Results: A total of 379 evaluations were performed in 192 patients. Acute thrombectomy was the most frequent EP (65%). The ultrasound study was found difficult in 9% and concordance among the two investigators was moderate (k=0.5). 31 evaluations were concluded as abnormal by the investigators from which the radiologist found abnormalities in 9 (29%): 8 femoral artery pseudoaneurysms and one circumflex artery thrombosis. Medical history reviews revealed only one patient developed a pseudoaneurysm and died because of its rupture two weeks after the EP.
Conclusions: Application of a systematic groin surveillance protocol including physical exam and ultrasonography in the Stroke Units is feasible and it may help in detecting potential local complications after the increasingly frequent use of EP in stroke patients.
Disclosure of interest: Yes

CLINICAL PRACTICE, MANAGEMENT AND CARE

1103

Patient-Centered Outcomes of Severe Stroke Survivors with Prolonged Respiratory Failure - a post hoc analysis of the SETPOINT2 Trial

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Background and aims: Patient- and family-centered outcomes in SETPOINT2, a trial of tracheostomy timing in patients with prolonged respiratory failure after severe stroke.
Methods: Study subjects ⩾18 years with respiratory failure due to severe stroke (SAH, ICH, or AIS) were randomized if likelihood and willingness to a prolonged course of care were present. Telephone assessment of survivors at 6 months included modified Rankin Scale (mRS), EuroQol 5D-5L (EQ-5D-5L), Burden Scale for Family Caregivers–short form (BSFC-s).
Results: 382 patients were enrolled, with median NIHSS 21 (14,28); ICH Score 3 (2,3); and WFNS score 5 (4,5). Among 248 survivors, 6-month-mRS was 0-3 in 80 (32%), 4 in 86 (35%), and 5 in 82 (33%). Median EQ-5D-5L (maximum score 1.0) was 0.3 (0.1,0.7); 70.4% survivors had not or hardly returned to usual activities, 59.6% were unable or had severe difficulty walking. Family caregivers reported median BSFC-s 14 (11,19), and 49% "severely" or "very severely" afflicted by care. Conversely, at 6 months, 69.5% of caregivers reported being "pleased with the results of treatment", 16.1% felt conflicted, and 7.5% were unhappy. 44/46 patients able to self-report were glad to be alive and 44/46 reported satisfaction with their outcome.
Conclusions: Despite severe disability in survivors and high burden on their caregivers, most survivors of severe stroke and their caregivers reported satisfaction with intensive treatment and outcomes of care.
Disclosure of interest: Yes

CLINICAL PRACTICE, MANAGEMENT AND CARE

1081

Characteristics, clinical practice patterns and outcomes of strokes in India: INSPIRE - A multi-centre prospective study

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Background and aims: India has a high burden of stroke but there is limited data available on characteristics of patients presenting with stroke in India. We documented the clinical characteristics, practice patterns and outcomes of patients presenting with acute stroke to Indian hospitals.
Methods: A prospective registry study of patients admitted with acute clinical stroke was conducted in 62 centres across different regions in India between 2009 and 2013.
Results: Of the 10,329 patients, 71.4% had ischemic stroke, 25.2% intracerebral haemorrhage (ICH) and 3.4% an undetermined stroke subtype. Mean age was 60 years (SD 14) with 19.9% younger than 50. 65% were male. A severe stroke at admission (modified-Rankin score of 4-5) was seen in 62%, with 38.4% of patients having severe disability at discharge or dying during hospitalisation. Cumulative mortality was 25% at 6 months. Neuroimaging was completed in 98%, 76% received physiotherapy, 17% speech and language therapy (SLT), 7.6% occupational therapy (OT), with variability among sites. 3.7% of ischemic stroke patients received thrombolysis, 92% antiplatelet therapy, 83% lipid lowering therapy. Receipt of physiotherapy (OR 0.41, 95% CI 0.33-0.52) and SLT (OR 0.45, 95% CI 0.32-0.65) was associated with lower mortality.
Conclusions: In India, one-in-five patients with acute stroke are under the age of 50 years, and one-quarter of stroke is ICH. There is a low provision of thrombolysis, and poor access to multi-disciplinary

rehabilitation highlighting how improvements are needed to reduce morbidity and mortality from stroke in India.
Disclosure of interest: No

CLINICAL PRACTICE, MANAGEMENT AND CARE

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REGIONAL ACUTE STROKE CARE IN THE NETHERLANDS: OVERVIEW OF MEDIAN DOOR-TO-DOOR-TO-GROIN TIMES IN THE DUTCH ACUTE STROKE AUDIT

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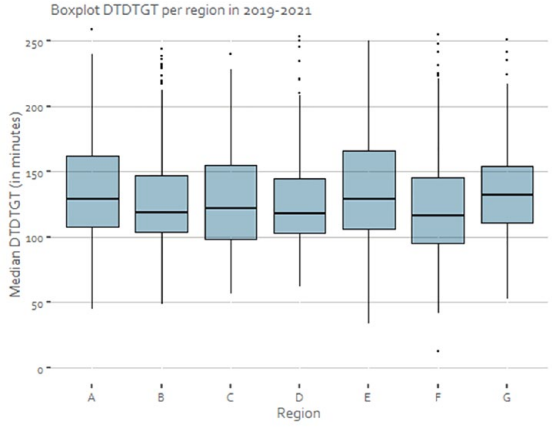
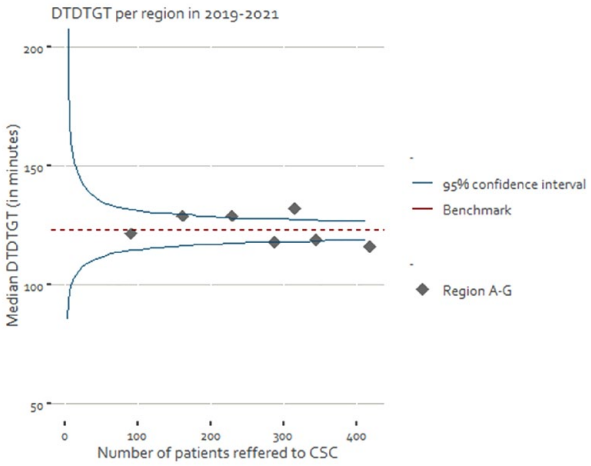
Background and aims: In the Dutch Acute Stroke Audit (DASA), data concerning individual stroke centers and regional performance measures are registered. Since fast inter-hospital transfer is crucial in EVT of patients with acute ischemic stroke (AIS), regional performance measures are essential in monitoring cooperation between hospitals. This study aims to show first-ever results of regional 'door-to-door-to-groin times´ (DTDTGT) in the Netherlands.
Methods: All consecutive AIS patients (⩾18 years old) registered in the DASA were included. Currently, 69 hospitals from 10 different regions register data prospectively in the DASA. 18 of these hospitals are comprehensive stroke centers (CSC) performing both IVT and EVT. The median DTDTG for different regions (wherein primary stroke centers (PSCs) and CSCs work together) were calculated.
Results: From 2016-2021, 179,351 patients with AIS were registered. 11,128 (6,2%) patients underwent EVT, of which 4710 (42,3%) were transferred from PCS to CSC for EVT. Due to missing data 3 regions were excluded, 7 regions remained comprising of 1845 transferred patients. In 2019, 2020 and 2021 the overall median DTDTGT in minutes(IQR) was 123(102-149), 125(105-155), 121(101-149) respectively. In these years there was a significant difference in median DTDTGTs between different regions (range 116-132,$p<0.05$).
Conclusions: There was no significant difference in the nationwide DTDTGT in the last three years. However, the DTDTGT did differ between regions, which suggests that cooperation can be further improved in some regions. In the future, the DTDTGT should become a mandatory measure to assess and improve regional inter-hospital cooperation in EVT of AIS.





Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

305

VIRTUAL GROUPED COUNSELLING TO COMMUNITY-DWELLING STROKE SURVIVORS TO ENHANCE DISEASE KNOWLEDGE AND SELF MANAGEMENT CONFIDENCE - EXPERIENCE FROM A REGIONAL HOSPITAL IN HONG KONG

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Background and aims: Supporting community-dwelling stroke survivors during the pandemic is crucial as they often encounter problems after discharge. An innovative solution of utilizing online platform to conduct grouped counselling has been implemented in a regional hospital in Hong Kong. Aims of the intervention are providing a shared platform for stroke survivors to enhance knowledge and self-management via mutual support.
Methods: Virtual grouped counselling by stroke nurses were conducted twice a month since March 2020.
The intervention was introduced to patients admitting to stroke unit of a regional hospital. Interested patients and caregivers were recruited. Repeated participations were allowed.
Participants' knowledge, self-management confidence, and satisfaction were assessed via online questionnaire before and after intervention.
Results: 527 episodes of tele-counselling for 197 stroke survivors and 36 caregivers were delivered from November 2021 to 2022.
Mean age of participants was 59.9 years old. Most participants experienced first-time stroke.
Participants' knowledge improved by 3.2 points (Fig. 1, $p < 0.001$) while self-management confidence improved by 5.6 points (Fig. 2, $p < 0.001$).
Participants were satisfied with virtual meeting, with mean satisfactory score of 9.0. They reported virtual format provided versatility in obtaining health knowledge and grouped nature of the intervention promoted social interaction.
19 participants (8.2%) were identified having health issues during intervention and were followed up individually.

Conclusions: Virtual grouped counselling provides effective support to community-dwelling stroke survivors amidst the pandemic. Grouped nature of intervention provides peer support and social interactions. The intervention provides timely and personalized support to stroke survivors.

Fig. 1 Distribution of Stroke Knowledge Score of Participants before and after intervention (n=234)

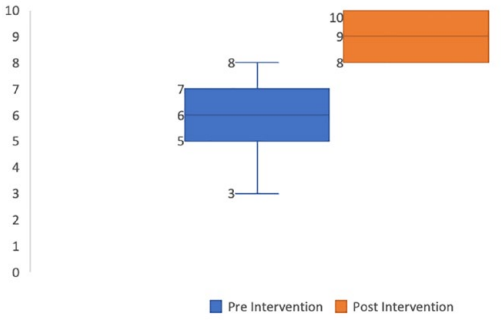
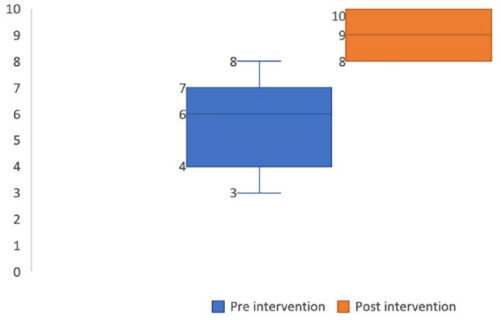


Fig. 2 Distribution of Self Management Confidence Score of Participants before and after intervention (n=234)



Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

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DEVELOPMENT OF A NATIONAL STROKE AUDIT IN IRELAND: DATASET FOR NON-ACUTE STROKE CARE AND REHABILITATION

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Background and aims: Advances in acute stroke treatment have led to greater survival rates and an increased need for post-acute stroke care and rehabilitation. The aim of this project is to establish a core minimum dataset for non-acute stroke care to be included as part of the newly-developed Irish National Audit of Stroke (INAS).
Methods: To date, stroke rehabilitation (non-acute) data has not been collected comprehensively in INAS. In this study, a stroke rehabilitative care dataset was identified through scoping review of international practice. Qualitative interviews with healthcare professionals (HCPs), researchers, stroke survivors and caregivers will determine aspects of rehabilitative care which should be measured in the audit. The work will be informed by a systematic review of patient-reported outcome measures (PROMs).
Results: The scoping review identified 21 eligible international stroke registries. A total of 54 existing INAS items relating to stroke rehabilitation were benchmarked against internationally-collected items. Nine items commonly collected by international stroke audits (not collected in Ireland) were also identified. During the qualitative interviews (n=52), HCPs and researchers reviewed the audit items and provided recommendations for improvement. Participants also highlighted challenges associated with data entry (e.g., limited time), and discussed the feasibility of follow-up audit to facilitate continuity of care. Stroke survivors and caregivers identified stroke-related impairments and neglected aspects of stroke care (e.g., discharge planning), to be included in INAS.
Conclusions: A final dataset for audit of stroke rehabilitation, benchmarked against international practice, will provide a "gold-standard" for evaluating and improving stroke care in Ireland.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

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Patient Reported Experience Measures in the UK

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Background and aims: We know that post-discharge is an area where stroke survivors are often let down, fall through the systems and do not receive the rehabilitation they need. However we have very little data to back this up, and even less to demonstrate the areas where improvements should be made. The Stroke Association has worked in partnership with NHS England, to design a questionnaire to collate patient experiences across the whole stroke pathway. This data is referred to as Patient Reported Experience Measures (PREMS). The purpose of the questionnaire is not to measure outcomes and success of the treatment and care received, but how the stroke survivor felt about their treatment and care, and how it was delivered.
Methods: The Stroke Association worked with stroke survivors to design the questions. The questionnaire will be distributed to all patients who had a stroke between May 2022 and September 2022. This means that 27,000 stroke survivors who are 4-8 months post stroke can feed back on their experiences in the acute setting, rehabilitation in the community, and wider community support, such as with returning to work and hobbies.
Results: The questionnaire will be mailed in January 2023, with the findings being available in summer 2023.
Conclusions: The conclusions presented will include the rationale and understanding of use of each question asked, the level of accessibility for as many stroke survivors as possible, and the options in place to support those for who it may not be fully accessible.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

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PROFESSIONAL REINTEGRATION AMONG PROFESSIONALLY ACTIVE PORTUGUESE STROKE SURVIVORS: A MULTICENTRIC STUDY

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Background and aims: Stroke incidence among professionally active people has been increasing in recent decades and, although many achieve independence and good functionality in daily life activities, changes in other domains may prevent complete social and professional reintegration, with detriment of their well-being and quality of life. The aim was to assess professional reintegration, the perceived impact of stroke on work, and the main determinants of return to work (RTW) among stroke survivors.

Methods: A cross-sectional study was performed, based on a cohort of stroke survivors. A structured questionnaire was administered to previously working stroke survivors, 18-24 months post-stroke. Data on sociodemographic characteristics, stroke features and their impact on work, access to rehabilitation services during hospital admission and after discharge, social support, and professional reintegration were reported by 553 stroke survivors.

Results: On average, 56.6% (95% CI 52.4–60.8) of stroke survivors resumed professional activity, 20 months after stroke. Approximately 90% of survivors who RTW, returned to the same job and same function they performed before stroke. The majority did not receive reintegration support. The main determinants of RTW were lower age, higher socioeconomic status, and better functional status.

Conclusions: Professional reintegration and vocational support after stroke, remained below the international goals for community reintegration of stroke survivors. Future studies should explore the impact of professional and social reintegration on the psychological health and quality of life of stroke survivors and the barriers, challenges, and strategies used to overcome them, to allow for effective professional reintegration policies.

Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

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Benefits of Zio patch monitoring in detecting early atrial fibrillation after stroke

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Background and aims: Atrial fibrillation (AF) causes up to 30% of ischaemic stroke, and earlier detection results in faster anticoagulation reducing stroke recurrence. We compared conventional Holter monitoring with Zio patches to assess detection rates, time from request to result, and the impact on outpatient appointments.

Methods: We retrospectively compared 339 patients who underwent standard Holter monitoring with 349 patients who had a Zio patch applied for 14 days. Zio patches were fitted as inpatients or sent to patients' homes for self-application, whereas Holter monitoring required separate hospital attendance for fitting and removal.

Results: AF was detected in 7.2% in the Zio group compared with 3.2% in the Holter group. 32% of AF was detected in Zio patches applied within 48hrs of stroke, suggesting a benefit from early hyperacute monitoring. With Holter, average time from referral to test was 42 days and 58 days to result, compared with 29 days and 51 days with Zio. With Zio, mean time to AF detection was 6.3 days and wear time 13.4/14 days (95% of target wear time). 41% of patients with Holter monitoring needed face to face follow-up cardiology appointments compared with 19% with Zio.

Conclusions: Zio patches detected more than double the rates of AF compared with usual Holter monitoring. Diagnostic yield was highest within 48hrs of stroke. Time to result was faster, with earlier anticoagulation. Patients did not need to attend hospital for Zio patch fitting and the need for follow up appointments was halved compared with usual monitoring.

Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

881

Understanding the configurations of inpatient stroke services in NHS England

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Background and aims: The introduction of stroke units has substantially improved the treatment of stroke patients. In England, national guidelines and policy documents recommend typical configurations of inpatient stroke care. However, it is unclear how closely inpatient stroke services delivered in a real-world setting fit these recommendations. This study aims to understand existing configurations of inpatient stroke care in the National Health Service in England.

Methods: A quantitative online survey, distributed via established professional networks, was completed by stroke therapists and nurses in England. Participants were invited to detail their local stroke inpatient configuration. Descriptive statistics were used to characterize the configurations.

Results: Responses were received from 49.7% of hospitals providing inpatient stroke services in England(n=92/185). Based on annual admission figures for 21/22 this represents services for 60.3% of patients recorded in the Sentinel Stroke National Audit Programme.

A comprehensive configuration, where all services are provided within one hospital, was reported by 40% of hospitals, 49% separated across two or more hospitals, and 11% 'other' configuration. Hospitals with two or three wards were most likely to report a comprehensive configuration (67%), whereas 66% of those with one ward reported separated. When accounting for admission and transferring patterns, there was high variability in configurations, with over 20 different combinations.

Conclusions: In practice, stroke inpatient service configurations are not as well defined as the typologies set out in clinical guidelines. High levels

of variation exist across NHS England. Further research is required to understand how this may influence patient outcomes or experience.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

1058

Using Communities of Practice (CoP) to improve Mechanical Thrombectomy (MT) delivery in England, a national quality improvement initiative

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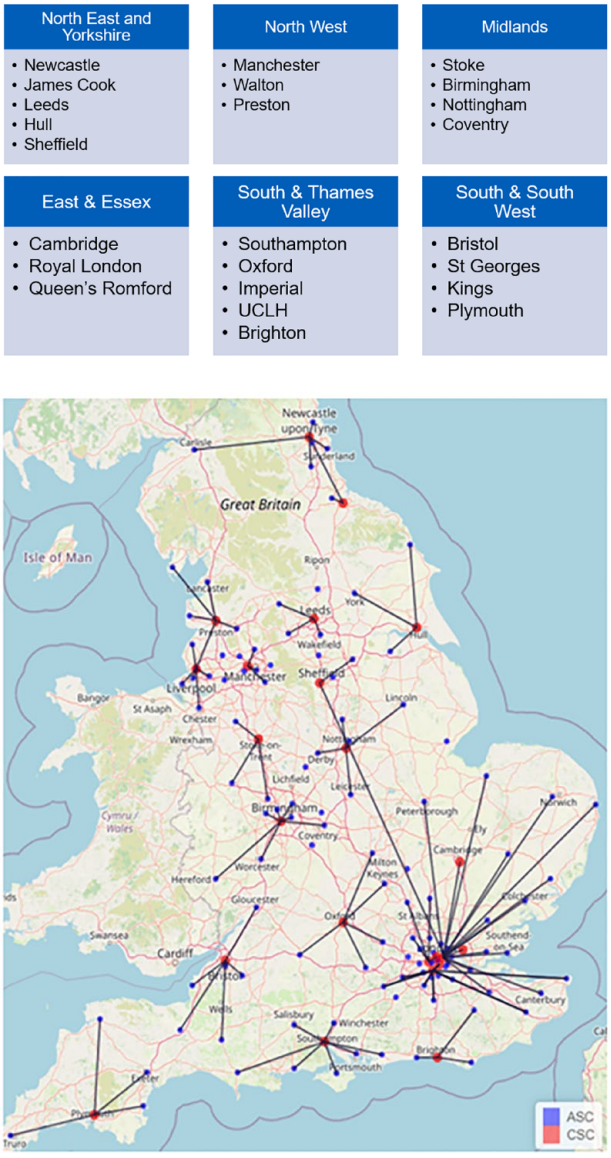
Background and aims: 2% received MT in England (Dec 2021). A long-Term Plan (LTP) objective is to achieve 10% by 2029. 24 neuroscience centres (CSC) deliver MT to 57,000,000 via a hub and spoke model serving 83 Acute Stroke Centres (ASC).
In April 2021 the national Thrombectomy Implementation Group (TIG) for NHSE commissioned Getting It Right First Time (GIRFT), Promoting Effective and Rapid Stroke Care (PEARS), Specialised Commissioning, Sentinel Stroke National Audit Programme (SSNAP) to produce a detailed analysis of MT delivery and a CoP quality improvement (QI) process. CoP may improve outcomes; requiring an active community of focused practitioners with a shared vision.
Methods: Process and outcome data analysed (up to Dec 2021): Hospital Entry statistics (HES), SSNAP, Diagnostic imaging Data (DID), AI company data.
6 CoP QI virtual meetings convened 2022.
Results:

- 5/24 CSC's offered a 24hr service.
- Average number of MT interventionalists per CSC: 4.
- Wide variation in number of MT's per operator: 5-40.
- Door In Door out (DIDO): 2hrs:22mins.
- Symptom onset to end procedure 6hrs:15min.
- 79% (IQR 72-83%) **TICI 2B-3.**
- 53% (IQR 37-63) Discharge **MRS 0-3.**
- 16% (IQ 5-27%) **Mortality.**
- No statistical correlation between volume of MT per operator with reported complications or outcomes but with wide variation.

Conclusions: MT provision in England appears safe with outcomes as expected for a real-world population. Considerable variation between units exists. Requirement for improvements in systematic outcome reporting, language/definitions used & case mix adjustment. Reducing DIDO times and increasing hours of operation are likely to improve access and outcomes.



Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

1236

FAST TRACT TRAINING OF NEW NURSES TO PROVIDE POST THROMBOLYSIS CARE IN THE ACUTE STROKE UNIT DURING COVID-19 PANDEMIC

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Background and aims: The COVID-19 pandemic has exacerbated the shortage of nurses, leaving many hospitals, including our acute stroke unit

(ASU), short-staffed. This led to inability to provide a 1:1-2 (nurse to patient) ratio to post intravenous thrombolysis (IVT) and endovascular clot retrieval (ECR) patients in our ASU. As a result, patients were admitted to intensive care unit (ICU) even if they did not require critical care nursing management. This paper describes the Quality Improvement (QI) project implemented to ensure sustainability in the provision of safe and high quality stroke care.

Methods: Traditionally the training of new nurses in ASU takes six months. A fast track a month stroke training was implemented. The training includes: a) completion of online stroke modules, b) senior stroke nurses support; c) series of in-services, d) one-on-one tutorial, and e) attending stroke codes. In addition, implementation of a pragmatic approach - the Optimal Post Tpa-IV Monitoring in Ischaemic Stroke (OPTIMIST) low intensity monitoring protocol (OPTIMIST study is run by the George Institute, Australia).

Results: Twenty two new nurses were trained to be stroke nurses. This increased the number of competent stroke nurses who can provide high quality care post thrombolysis in the ASU. The additional senior nursing staff after-hours provided support in the ASU. Post thrombolysis patients are now admitted in the ASU.

Conclusions: Fast track stroke nurse training to new graduate and new nursing staff was successful. Our experience show that successful implementation of QI needs commitment from staff and support from hospital executives.

Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

1256

Predicting whether ECR is abandoned due to recanalization: modelling clinical and imaging factors in remote patients

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Background and aims: Endovascular clot retrieval (ECR) may be abandoned after long transfer due to either recanalization or significant deterioration. Prediction of possible recanalization may improve workforce utilization by delaying activation of the endovascular team for patients who have a high likelihood of recanalization during transfer. Conversely, endovascular teams should be prepared for patients who are unlikely to experience recanalization.

Methods: Prospective cases referred from remote regions of Victoria and Tasmania to the Royal Melbourne Hospital for the purpose of endovascular therapy were included into analysis from 2020-2022. Recanalization was defined as revascularization on repeat CTA/P or DSA which resulted in the abandonment of ECR. Age, presenting NIHSS, Transfer distance, lesion anatomical location and lysis therapy were entered into a binomial logistic regression model with recanalization as the dependent variable.

Results: A total of 172 patients were transferred during the period and 5 patients (2.9%) were excluded due to insufficient documentation/imaging. The median transfer distance was 185km (IQR 130-251). Rates of recanalization according to vessel location were: M1 19/77 (24.7%), M2 13/27 (48.1%), P1 3/6 (50%), Basilar 3/14 (21.4%), ICA 1/21 (4.8%), Tandem 1/22 (4.5%). The logistic regression explained 21.7% (Nagelkerke R2) of the variance of recanalization ($p < 0.05$). Of the five independent variables 2 were significant: lesion location (M1,M2,ICA,Tandem) and lysis administration. Lysis was associated with 2.5 times greater odds of recanalization.

Conclusions: Distal occlusions and thrombolysis treatment may be useful variables to predict whether patients will require repeat assessment prior to activation of the endovascular team.

Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

1275

Association between adherence to a stroke care pathway and functional outcome after stroke

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Background and aims: A national pathway of stroke care to ensure optimal treatment within predefined time limits was introduced in Norway in 2018. The aim of the present study was to evaluate if good adherence to the pathway was associated with functional outcome 3 months after stroke.

Methods: We performed a register-based study with data from the Norwegian stroke register. Patients registered with acute stroke in 2019, one year after the stroke care pathway was introduced, were included. Functional outcome at 3 months measured by the modified Rankin Scale (mRS) in patients with "good adherence" was compared to patients with "less adherence". Achieving the target time from symptom to 1) contact with the emergency medical service (< 15 minutes), 2) admission to hospital (<4 hours) and time from hospital admission to admission to a stroke unit (< 3 hours) was defined as good adherence. Logistic regression analyses were used to analyse the associations between adherence and mRS (mRS 0-2 versus 3-5).

Results: In total 2818 patients were included, 460 (16.%) were in the good adherence group. At 3 months post-stroke the probability of having good functional outcome was significantly higher in the good versus the less adherence group (OR 1.36, 95% CI 1.04-1.79, $p = 0.026$).

Conclusions: Good adherence to the stroke care pathway was significantly associated with independence at 3 months post-stroke.

Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

1290

STROKE SUSPICION DISPATCH BY THE EMERGENCY MEDICAL COMMUNICATION CENTRE: A RETROSPECTIVE OBSERVATIONAL STUDY FROM WESTERN NORWAY

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Background and aims: There is limited evidence for the Emergency Medical Communication Centre's (EMCC) role in reducing time delays in stroke. We analysed the impact of EMCC-communicated stroke suspicion to ambulances on time delays and intravenous thrombolysis (IVT) rate.
Methods: We collected 2021 data from patients admitted to Bergen and Førde Hospital Trust, Norway, suffering from acute ischemic stroke. The EMCC classifies level of emergency using the Medical Priority Dispatch System (MPDS). Reperfusion treatment data, prehospital Face-Arm-Speech-Time (FAST) symptoms, National Institute of Stroke Scale (NIHSS) score at admission, prehospital and in-hospital time metrics were collected. Patient groups were dichotomised in stroke suspicion/no stroke suspicion by MPDS code.
Results: In total, 448/575 (78%) stroke patients were admitted to the hospitals by ambulance after EMCC contact. EMCC suspected stroke in 253 cases (56%). Patients with stroke suspicion had lower median ambulance on-scene time (12 vs 13 minutes; p=0.001), lower median time from EMCC call to hospital admission (40 vs 47 minutes; p=0.021) and a higher proportions of prehospital FAST symptoms (232/253 (92%) vs 99/195 (51%); p<0.001). IVT rate was also higher (84/253 (33%) vs 39/195 (20%); p=0.002) and median door-to-needle time tended to be lower (26 vs 32 min; p=0.053). For patients admitted directly to an endovascular centre with stroke suspicion, median door-to-groin puncture time was lower (66 vs 141 minutes; p=0.004).
Conclusions: Increasing the EMCC's sensitivity in stroke suspicion may further reduce prehospital and in-hospital time delays, thus potentially increasing the proportion of patients eligible for recanalisation therapies on hospital admission.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

1452

Understanding clinical deterioration after stroke: a retrospective audit of clinical observations

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Background and aims: Understanding which patients may be at risk of deterioration following acute stroke might offer the potential to avoid preventable mortality and morbidity. The aim of this study was to assess the accuracy of the National Early Warning Score (NEWS2) score at predicting mortality in acute stroke admissions.
Methods: A retrospective audit was performed using data from the Electronic Healthcare Records of all stroke admissions patients admitted to a Comprehensive Stroke Unit (CSU) between July 2020 – October 2022. Simple demographics, type of stroke, NEWS2 observations, and outcome of in-hospital death were extracted. Clinical deterioration was defined according to National standards as any single observation component >=3 or overall NEWS2 >=5 during hospital admission.
Results: 1422 patients with acute stroke were admitted to the CSU. The mean age was 74(SD=15), and 650(45.7%) were female. 1217(85.6%) patients had ischaemic stroke, and 205(14.4%) had haemorrhagic stroke.
In the ischaemic stroke group, 456 (37.4%) deteriorated according to NEWS2 criteria and 104 (8.5%) patients died in-hospital. The sensitivity and sensitivity of NEWS2 criteria predicting in-hospital mortality were 21.7% and 95.3%. Positive predictive value was (PPV)=57.7%, negative predictive value (NPV)=80.6%.
In the haemorrhagic stroke group, 108 (52.6%) deteriorated, 50 (32.4%) patients died in-hospital. The sensitivity of NEWS2 criteria predicting in-hospital mortality was 40.3%, specificity=82.5%, PPV=57.7% and NPV=80.6%.
Conclusions: Deterioration according to NEWS2 standards were not a sensitive predictor of in-hospital mortality in stroke patients, particularly acute ischaemic stroke patients. Further work is underway to identify a stroke specific prediction tool for in-hospital mortality.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

1559

Overcoming barriers on the way to reperfusion therapy implementation in ischemic stroke patients in Kyrgyzstan: results of the first four years implementation of the Stroke Roadmap

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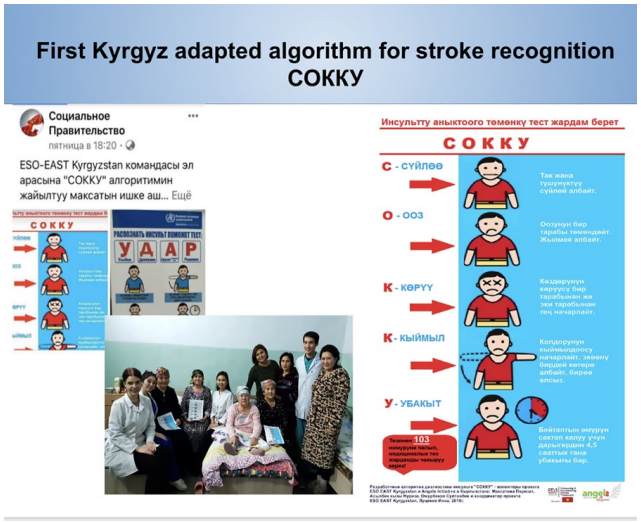
Background and aims: In Kyrgyzstan, a low income country, stroke affects individuals in the most productive years of their lives: the median age of ischemic stroke patients is 67 years and poststroke disability is high (mRs = 3). Insurance-covered reperfusion therapy was absent in Kyrgyzstan due to a high cost and limited resources.
Methods: A stroke Roadmap in Kyrgyzstan was designed in collaboration with WHO and ESO leaders and was implemented in action in 2019 aimed to reduce the gap in evidence-based stroke treatment and prepare the neurologists and paramedics for reperfusion therapy implementation and consists of the structured plan for all the healthcare levels for 10 years.
Results: We used three strategies according to the Roadmap: 1) facilitated the unified electronic stroke registry usage in all regions of Kyrgyzstan, 2) trained paramedics and stroke physicians in stroke recognition, NIHSS and mRs use, translating them in Kyrgyz language, and detecting the early neuroimaging patterns on CT in ischemic stroke patients and 3) influenced the stroke logistics, prioritizing the early admission of stroke patients into hospitals.
Conclusions: Next stage will be implementation of the CT-scans into the governmental hospitals as all the neuroimaging is now located in the private centers surrounding the stroke hospitals, enlargement the network of stroke units and stroke ready hospitals training the personnel in the thrombolysis use and stroke patients monitoring.

Prepared for the Ministry of Health of Kyrgyzstan By the WHO Regional Office for Europe

The authors of the report are: Jill Farrington, WHO Regional Office for Europe, Denmark; Francesca Romana Pezzella, Neurologist, Stroke Unit, San Camillo Forlanini, Rome, Italy and WHO consultant; Alexei Yakovlev, Cardiologist, Federal Almazov North-West Medical Research Centre, St. Petersburg, Russian Federation and WHO consultant.



Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

1686

High fidelity simulation training course with augmented reality tools helped reduce door-to-needle times in a UK comprehensive stroke centre: a multi-faceted quality improvement project

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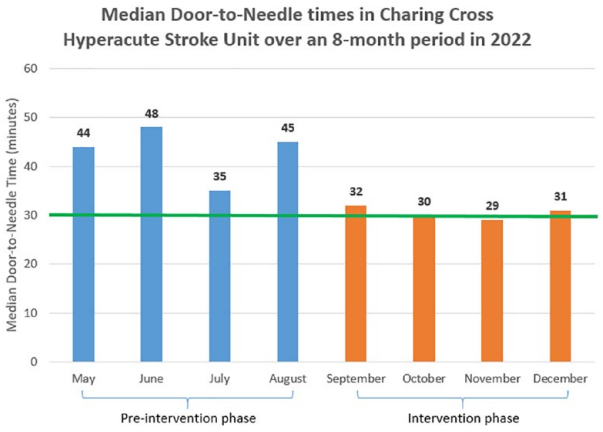
Background and aims: The European Stroke Organisation recommends that thrombolysis following acute ischaemic stroke should be initiated ideally within 30 minutes and this is supported by the Sentinel Stroke National Audit Programme targets (SSNAP). The aim of this quality improvement project was to reduce the door to needle times (DNT) in Charing Cross Hospital, one of UK's largest comprehensive stroke centre.
Methods: A retrospective qualitative analysis of cases in the 4 month pre-intervention period using a process mapping principle helped identify key delays in the thrombolysis pathway. In the 4 month intervention stage, a multi-faceted strategy involving updating institution-specific processes and improving clinical decision making was conducted. At its core, was the design and implementation of weekly high fidelity simulation training sessions for physicians and allied healthcare professionals including the use of augmented reality learning tools.
Results: 36 patients received intravenous thrombolysis in the pre-intervention phase with a median DNT of 47 minutes (SD ±20 minutes). Following the introduction of the simulation training course, 59 patients received intravenous thrombolysis with a median DNT of 31 minutes (SD ±16 minutes). This represented a 34.04% improvement ($p<0.00001$) in DNT with SSNAP 30-minutes target being achieved in the final 2 months of the intervention phase.
Conclusions: The most significant delays in thrombolysis pathway were related to clinical decision making and familiarity with institution-specific processes. The DNT can be successfully improved using a frequent high fidelity simulation training course. Augmented reality can be an additional tool to improve immersion in simulated cases.



Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

1788

OPTIMISING A WIDELY USED AMBULANCE DISPATCH ALGORITHIM FOR MOBILE STROKE UNITS

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Background and aims: Ambulance call-taker dispatch algorithms have low specificity for stroke recognition, which particularly impacts Mobile Stroke Units (MSUs). The popular dispatch algorithm, Advanced Medical Priority Dispatch System (AMPDS), combines a call-taker identified stroke symptom description sub-code followed by an ordinal scale ranging from "no evidence" to "clear evidence" assessed by orally-directed face/arm/speech test (stroke diagnostic tool). We retrospectively examined AMPDS dispatch codes from Melbourne MSU cases to determine whether sub-codes could be excluded to improve the specificity of identifying treatment-eligible patients.
Methods: We included data from the Melbourne MSU registry (2017-2022) to investigate the number of dispatches required to correctly identify treated patients (reperfusion therapy or intracranial hemorrhage) for each individual AMPDS sub-code.
Results: We included n=5921 cases of which 3878 (65.5%) were cancelled en-route and 342 (6.1%) required treatment. Best annualized dispatch-to-treatment ratios were seen for symptom sub-codes "not alert" (350.2 dispatches to 38.8 treatments/yr; Ratio:9.0) and "facial droop/paralysis" (58.9 to 5.5; R:10.6), while "vision loss" (68.5 to 0.9; R:80.3), "severe headaches" (14.3 to 0) and "TIA history" (8.5 to 0.2; R:40.0) were the worst performing. Stroke diagnostic tool was most promising for extremes, with "clear evidence" (335.1 to 45.4; R7.4) the best and "no evidence" (477.1 to 6.2; R:77.1) the worst performing.

Conclusions: Removing the worst performing AMPDS symptom description sub-codes would minimally impact treatment numbers but, reduce futile dispatches by ~7%. In contrast, removing the worst performing stroke diagnostic tool examination grade could reduce futile dispatches by one third but impact ~8% of total treatments.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

2040

National Clinical Programme for Stroke in Ireland: Development of a National Stroke Strategy

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Background and aims: The National Clinical Programme (NCP) for Stroke was established in 2010 to reorganise and develop Irish stroke services. While considerable improvements in services and patient outcomes have been achieved to date, the NCP for Stroke recognised the need for the development of a five-year National Stroke Strategy (NSS) 2022-2027 to meet the predicted 59% increase in stroke in Ireland, rapidly changing milieu of acute stroke treatment and to implement the Stroke Action Plan for Europe (SAP-E).
Methods: A four pillar strategy was proposed to cover the areas of ***prevention, acute care & cure***, **rehabilitation** & ***restoration to living*** and ***education & research.*** Multidisciplinary working groups with specific expertise in each area were set up in 2018 with the goal of identifying high impact measures in each theme, realistically deliverable over a 5 year period. A comprehensive consultation process with relevant stakeholders took place over an 18-month period.
Results: The NSS was completed in 2020 and submitted to the Irish Health Service Executive in December 2020, approved by the office of Chief Clinical Officer in July 2021 and adopted by the executive management team in 2022. The NSS represents a costed strategy of €37 million over 5 years.
Conclusions: The NSS is a deliverable strategy which is fully in line with the SAP-E and represents a significant but compulsory investment in stroke over the next five years. The NSS will pay significant dividends for patients, healthcare and Irish society as a whole.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

2080

CROATIAN EXPERIENCE ON RES-Q REGISTRY FOR MONITORING THE QUALITY OF STROKE CARE FROM 2019 TO 2022 YEAR

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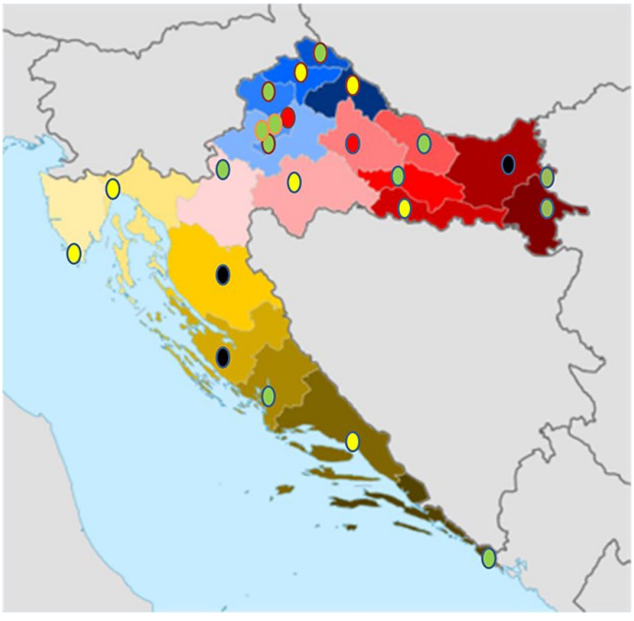
Background and aims: Stroke registry is a tool for improving stroke care and achieving goals pointed in Stroke Action Plan for Europe. The Registry of Stroke Care Quality (RES-Q) was launched by ESO-EAST (Enhancing and Accelerating Stroke Treatment) in 2016, and Croatia has participated since 2017.
The aim was to compare results from the RES-Q registry for Croatia for the first quarters of 2019 to 2022.
Methods: Data on demographics, stroke care pathway, specific acute treatment issues, and stroke prevention issues in all acute stroke admissions in Croatia during the first years' quarters from 2019 to 2022, was analyzed.



Results: Acute hospitals which provide stroke treatment recruited 2728 patients. Figure 1. shows the map of Croatia with all centers. Table 1. shows the number of patients recruited by site and year. Table 2. shows patients' main baseline characteristics and outcome measures.
Conclusions: Our results showed improvement in recanalization rates across Croatia (IVT from 10% to 20.6%, and mechanical thrombectomy from 4.0 to 6.6.%), reaching a median DTN time of 39 minutes in 2021 and DTG time of 57.5 minutes in 2021. Inter-hospital transfer was reduced during the first wave of the COVID-19 pandemic in 2020. Secondary stroke prevention might be improved by increasing the usage of statins and antiplatelets while performing smoking cessation programs which has also shown substantial improvement. In the future, all stroke centers should be involved in the stroke registry to achieve more accurate data which would guide us to improve stroke care in Croatia.

Croatia – Hospitals with recruited patients	2019	2020	2021	2022
University Hospital Center Zagreb (IVT & MT available)	302 Jan-Mar	202 Jan-Mar	214 Jan-Mar	112 Jan-Mar
Sveti Duh University Hospital-Zagreb	49	49	61	33
Clinical hospital center Rijeka (IVT & MT available)	0	0	115 Jan-Mar	25
Regional Hospital Vinkovci	37	5	27	75 Jan-Mar
General Hospital Virovitica	31	32	32	32
University Hospital Center "Sestre milosrdnice" – Zagreb (IVT+MT available)	0	30	96 Jan-Mar	39
Clinical Hospital Centre Split (IVT & MT available)	59	66	0	0
County Hospital Cakovec	28	45	31	30
General County Hospital Vukovar	29	20	23	4
University Hospital Dubrava	52	0	0	0
General Hospital Pula	34	0	28	0
General Hospital Zabok	30	27	26	29
General County Hospital Pozega	8	31	29	0
General hospital Sibenik	29	25	24	31
General Hospital Karlovac	28	22	27	32
General Hospital "Dr. J. Benčević" Slavonski Brod	31	33	0	0
General Hospital Bjelovar	0	30	0	0
General Hospital Dubrovnik	0	31	19	2
Varazdin General Hospital	0	0	48	18
General Hospital "Dr. Ivo Pedišić" Sisak	5	0	0	16
General Hospital "dr.Tomislav Bardek" Koprivnica	0	29	0	24

Main baseline data and outcome results	2019	2020	2021	2022
Recruited patients	749	677	800	502
Number of participating centers	15	16	15	15
Main stroke types (%)				
Ischemic	79.4	81.8	77.0	82.1
Intracerebral hemorrhage	8.4	10.9	11.0	9.6
Subarachnoid hemorrhage	4.3	2.7	2.3	4.0
Age (median) – years	74	75	76	74.5
% Female patients	50.6	50.52	53.5	46.6
Initial NIHSS (median)	7	7	6	5
% NIHSS performed	46.89	58.28	70.11	72.5
CT/MR performed on admission (%)	98.46	98.01	99.34	100
within 1 hour	81.46	80.13	89.18	66.53
Intravenous thrombolysis rate (%)	10.0	11.0	15.2	20.6
Door-to-Needle time (median)	50	50	39	47.5
Mechanical thrombectomy rate (%)	4.0	5.2	6.1	6.6
Door-to-Groin time (median)	90	66	57.5	62
Modified Rankin Scale at discharge (median)	3	3	3	4
Hospital stay (median)	8 days	8 days	8 days	7 days
Mortality rate (%)	11.49	14.26	9.13	11.55
Dysphagia screening (%)	87.00	73.56	91.69	80.14
Rehabilitation asessment	90.42	77.36	92.79	96.62
Discharge destination				
Home	60.14	60.77	60.46	57.57
Same center	3.38	6.39	7.60	6.5
Another center	5.27	7.58	10.77	12.35
Social facility care	9.73	11.0	12.04	11.95
Secondary prevention				
% antihypertensives (all stroke)	90.84	92.16	90.37	84.46
% antiplatelets after ischemic stroke without Afib	86.85	94.33	95.04	95.49
% anticoagulants in patients with ischemic stroke and AFib	99,03	98.54	98.31	91.53
% statins prescribed	61.57	63.75	77.29	78.21
% smoking cessation (in smokers)	9.62	10.84	79.35	75.71

Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

2115

ORGANIZATION AND QUALITY CONTROL OF STROKE SERVICE PERFORMANCE IN ARMENIA

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Background and aims: Acute stroke care service in Armenia was established in 2019 as a part of the national stroke program launched by government. The aim of this study was to evaluate the organization and quality of stroke service performance at a tertiary hospital in Armenia during its first 2 years after the establishment of acute stroke care service.
Methods: The study was based on retrospective analyzes of acute ischemic stroke patients of Astghik medical center who benefited from reperfusion therapies (intravenous thrombolysis and/or endovascular thrombectomy)between February of 2021 to December of 2022. Primary outcome was year over year proficiency in documenting performance measures. Secondary outcome was year over year improvement of the provided care.
Results: The total number of patients with acute ischemic stroke in the first 0-24 hours of symptom onset was 528 from which 356 were treated with reperfusion therapies. The proficiency of documentation of performance measures increased in year-over year analysis as did the total number of patients treated with reperfusion therapies. A significant improvement of time metrics was decrease of the median door-to-puncture time from 105 minutes (IQR 80-120) in 2021 to 90 minutes (IQR 80-100) in 2022. The median length of hospital stay was 8(IQR 5-11) in 2021 and 4(IQR 3-7) in 2022.
Conclusions: Our study demonstrated that the effective use of performance measures and continuous quality control can serve a methodology to achieve structured and advanced stroke care model in an experience-limited context.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

2200

IMPACT OF SIMULATION TRAINING ON STROKE TREATMENT ON-SITE IN UKRAINE

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Background and aims: Stroke is the 2nd leading cause of death in Ukraine. The rate of revascularization for ischemic stroke was 1,8% in 2022 year (1,5% for thrombolysis, 0,3% for thrombectomy). To improve the quality of Acute Stroke treatment and to increase revascularization rate we created on-site Stroke Simulation Training Workshop and performed trainings for the physicians (predominantly neurologists) in 48 hospitals across all over the country.
Methods: Trainings were started in February 2021. The program consists of theoretical part (review of guidelines and completed trials), training on Stroke scales (review of pre-hospital and in-hospital scales and simulation training on NIHSS), training on Neuroimaging for non-radiologists and simulation training in emergency department.
Results: 48 trainings were done in 21 regions of Ukraine (of 24 regions). We observed the direct and indirect impact on thrombolysis and thrombectomy rate in Ukraine. The first, hospitals that were trained increased their tPA rate - from 802 in 2020 year to 4373 (+445,3%). The second, other, neighbouring, hospitals started to perform tPA. From 2020 to 2022 year the number of hospitals increased more than twice from 97 to 201 and number of tPA increased from 1573 to 6256 (+297,8%) and now corresponds to 6,11%.
Conclusions: Thus, on-site trainings are one of the most important factors to improve the stroke cere in country.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

2239

IS STROKE KNOWLEDGE RETAINED? FAST HEROES' 4-YEAR LONGITUDINAL RESULTS

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Background and aims: Various campaigns have highlighted the importance to increase stroke knowledge in the public. Educational stroke programs seem to increase awareness about stroke management (Zhong et al., 2020). However, Hickey et al. (2018) reported that actual stroke knowledge post mass campaign implementation remains poor. Therefore "FAST Heroes" campaign has a multi-layer knowledge dissemination design. The present study evaluates stroke knowledge retention four years post program implementation in school-aged children without any knowledge reinforcement during this time.
Methods: Forty-seven school-aged children completed the online stroke preparedness questionnaire during class four years post program implementation.
Results: 21% of the students could still recognize speech difficulties, 40% arm weakness and 51% face drooping as stroke symptoms. 47% of students could recall the European Emergency Number and this percentage was increased to 53% if the Greek Medical Emergency Service (166) was accounted as correct.
Conclusions: There is still knowledge gain even four years after program completion. The design of the FAST Heroes campaign (i.e. 5-week duration, age-appropriate exercises, cartoon animations, song and dance elements, sentimentally driven activities and 3-layer education dissemination) facilitates long-term knowledge retention. Broad implementation potentially as part of the annual curriculum in schools can impact community stroke knowledge and should be recommended.

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Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

2249

Tele-OT: A new intervention tool to facilitate occupational performance for stroke patients

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Background and aims: After stroke, coming back home is difficult for most stroke patients. Occupational Therapy (OT) promotes coping with this situation but in-home intervention is scarce. We aimed to evaluate a tele-OT intervention through a holistic app to provide OT after discharge from a comprehensive stroke center.
Methods: Consecutive stroke patients discharged home were included in a multimodal digital follow-up program (NORA) through a mobile application validated for communication, education, adherence, risk factors control and PROMs/PREMs recollection. Patients with OT needs are offered a telematic visit to solve stroke-related doubts, everyday activities, home modifications promoting patient's autonomy and self-care. A tele-OT satisfaction questionnaire (PREM) was recollected.
Results: Over two years, 993 patients were included in NORA follow-up and reported PROMs at 7-30 days. 147 patients presented OT needs and were included in our tele-OT intervention. Sixty-one were men, with a mean age of 68.5y and a median mRS of 2 at hospital discharge. Tele-OT patients reported worse PROMs than the global series: in HADS, 40.8% anxiety and 34.2% depression and in PROMIS-10 89.3% altered mental health and 82.1% altered physical health, as compared with 13.1%, 17.7%, 64.7%, and 54.8% respectively ($p<0.001$)
108 patients answered the tele-OT PREM. The median usefulness of intervention (0-10) was 8.2 and 65% reported being "very satisfied" with the visit.
Conclusions: Tele-OT intervention is feasible and considered useful for most stroke patients with OT requirements. Poor PROMs may help with the selection of patients for tele-OT intervention.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

2378

ENHANCING QUALITY IMPROVEMENT IN ACUTE STROKE SERVICES IN IRELAND: DEVELOPMENT OF THE IRISH NATIONAL AUDIT OF STROKE

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Background and aims: Population ageing, treatment advances, evolving models of care, and between-hospital heterogeneity in patient outcomes highlight the need for continual audit of stroke care to evaluate whether patients are being delivered evidence-based practice in a high quality equitable manner. This project aims to develop internationally-benchmarked, core minimum datasets for acute and non-acute stroke care for integration into the newly-developed Irish National Audit of Stroke (INAS).
Methods: In the acute phase, a scoping review of international practice identified 21 stroke registries/audits with national coverage and continuous data collection. Acute stroke care data items were extracted from data dictionaries, translated, and charted. Irish core clinical and thrombectomy items were benchmarked against these internationally-collected acute items to identify commonalities and/or gaps in coverage.
Results: A synthesised inventory of acute care data items, including existing Irish items (*n*=103) and the most frequently-collected international items (*n*=97), were reviewed by key stakeholders in a three-stage Delphi process to obtain their expert perspectives as to the worthiness and appropriateness of items for INAS. Consensus agreement was obtained and a core minimum dataset for acute stroke care audit was finalised. Examples of items considered for addition to INAS include items that examine risk factors for stroke and associated secondary prevention.
Conclusions: The minimum datasets, as guided by best practice international standards, local priorities, and iterative cycles of stakeholder engagement, will act as the "gold standard" for monitoring stroke care in Ireland with the ultimate aims of enhancing patient recovery and supporting local and national quality improvement.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

2401

Stroke nurse assistance saves time in acute stroke managment

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Background and aims: Intravenous thrombolysis for acute ischemic stroke therapy has been established for decades and recently widely implemented thrombectomy has revolutionised acute stroke treatment even in the elderly. However, both therapies are delivered in heterogenic settings with the potential for ameliorating logistic processes. We aimed to investigate effects of specialised stroke nurse presence on time metrics in recanalising stroke therapy.
Methods: After introducing specialised stroke nurse assistance in acute stroke management in a University neurology department in April 2021, all acute stroke patients primarily admitted or secondarily shipped for lysis, thrombectomy or a combination of both (bridging therapy) between 04/2021 and 12/2022 were included in the analysis.
Results: 469 patients (median age: 75years; female: 51,6%) presenting with acute stroke symptoms or wake-up stroke (19,6%) were analysed. IV-rtPA-lysis was performed in 67,6% patients (n=317, n=67 of which externally), in-house thrombectomy in 308 patients (65,7%), bridging therapy in 156 patients (33,3%).
Stroke-nurse assisted acute stroke management resulted in a reduction of door-to-image (median: 9 vs. 11 min, p=0,03) as well as in-house door-to-needle time (median 28 vs. 35min, p=0,018), the two groups were balanced for age (p=0,943) and gender (p=0.669).
Conclusions: Stroke-nurse assisted acute stroke management resulted in a reduction of procedural time metrics in a tertiary stroke center, underlining that there is still time for improvement with regard to structural organisation of patient management. Logistic optimisation in early acute stroke care is an easily implementable and cost-efficient measure with the potential to improve patients' individual outcome after acute stroke therapy.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

2404

TELEMEDICINE-ENABLED PRE-HOSPITAL TRIAGE IN ACUTE STROKE – A MIXED METHODS SYSTEMATIC REVIEW

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Background and aims: Technology-enabled interventions may permit rapid pre-hospital triage of patients with acute onset stroke-like symptoms to hospital sites or diagnostics most appropriate to their clinical presentation and need, leading to improved functional outcomes when compared to standard emergency care. We aimed to use a mixed methods approach to review interventions incorporating telemedicine for stroke in the pre-hospital setting.
Methods: A search strategy was developed in collaboration with a data information specialist. A systematic search of the following electronic databases was undertaken: MEDLINE (Ovid); EMBASE; The Cochrane Library; CINAHL and Web of Science. Quantitative and qualitative studies meeting criteria predefined in a published protocol were selected for data extraction. Functional and process outcomes were assessed. The study protocol is registered with PROSPERO (CRD42022325590).
Results: 29 quantitative studies and 7 qualitative studies were identified. Mobile stroke units (MSUs) were associated with improved thrombolysis rates, onset-to-treatment times and functional outcomes compared to standard Emergency Medical Services (EMS). Prehospital EMS assessment

with additional teleconsultation with a stroke clinician can improve onset-to-puncture times in thrombectomy. Teleaudio-visual pre-hospital triage may improve door-to-needle and onset-to-groin times.

Conclusions: While interventions incorporating MSUs improve patient outcomes by improving process metrics, MSUs may not be generalizable, particularly to low density and rural areas. Telemedicine-enabled interventions including audio-visual prehospital triage and interventions involving telephone-only communications may significantly improve process outcomes within organised systems with broader potential for implementation. Process assimilation, routinisation and championing may influence the implementation and impact of prehospital acute stroke triage efforts.

Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

2417

SIMULATED INTERVAL TIMES TO AID PARTICIPANT FEEDBACK AND ORGANISER EVALUATION

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Background and aims: Clinical simulation training is well-suited to hyperacute stroke given complexity of decision making and inherent time pressures. We outline an approach to utilising time performance for key intervals (Door-to-Needle (DNT) and Door-to-Decision times (DDeT)) to assess session effectiveness and participant performance in stroke simulation training.

Methods: Sessions involved 2 teams (each comprising: doctor/nurse/remote decision-maker) participating/observing consecutively over 6 randomly ordered cases.

Cases were selected from a cohort of acute stroke presentations to represent various scenarios (wake-up, frailty etc.), while ensuring comparable complexity among cases (including factors influencing decision-making (DeBrun,2018)).

Each case began with pre-alert and ended when thrombolysis was delivered. DNT/DDeT was determined from video recordings and adjusted for simulation artefacts (e.g. shortened transport times). Ethical approval was not required.

We used one-way ANOVA to compare effects of case, order, group, team composition and participant factors on DNT and DDeT. Significant factors were included in multivariable binary logistic regression to determine odds of DNT<30mins.

Results: Over 9 sessions, 51 scenarios were completed (average per-session 5.8(5-6), average group size 4.5(4-6))

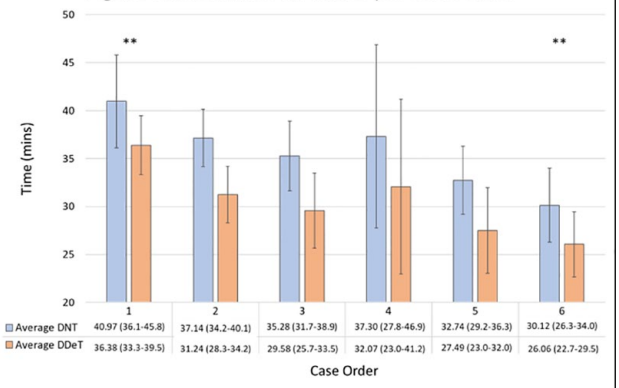
In univariate analysis, only number of cases completed was significantly associated with reduced DNT ($p<0.01$) and DDeT ($p=0.01$; Fig 1) .

Odds of DNT<30mins were significantly greater in later cases(4-6) compared with early cases(1-3) (OR 9.6, CI:1.01-91.16,$p<0.05$).

DNT/DDeT per-participant was supplied post-simulation, allowing progress tracking and peer comparison(fig.2).

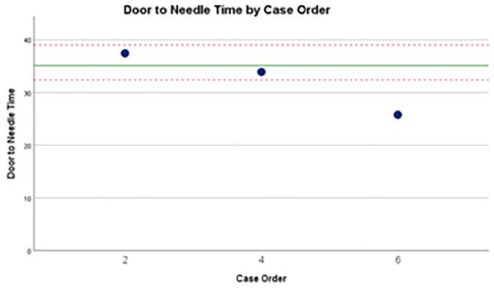
Conclusions: In a simulation setting, key time treatment-relevant intervals improved with practice. Benchmarking performance by group and individuals may aid assessment of course effectiveness in training.

Figure 1. Mean Interval Times per Case Order



** denotes significant difference between groups at <0.01 level in DNT and DDeT

Figure 2. Example of per-participant feedback



Key: Blue marker - your teams time, Green line - median performance of all teams across all scenarios, Red broken line – IQR

Note: only simulations you were directly involved in are included (i.e. observed scenarios omitted)

Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

1096

3-month outcome in drip and ship and mothership models of mechanical thrombectomy in the Comprehensive Stroke Center in Krakow, Poland

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Background and aims: It is still not known which model of delivering patients for MT, via direct admission to the Comprehensive Stroke Center (CSC) (mothership [MS]) or via transferred from primary stroke centres (drip-and-ship [DS]) is more beneficial for stroke outcomes.

Methods: We studied mortality and good outcome (mRS≤ 2) at day 90 of acute ischemic stroke (AIS) patients in Malopolska Voivodeship (MV) in Poland who underwent mechanical thrombectomy (MT). MV is in south-eastern Poland and has a population of 3.36 million inhabitants. AIS patients are admitted to the nearest stroke unit (15-unit Network) in the

region or CSC, if indicated, where intravenous thrombolysis (IVT) is performed. Those fulfilling the MT criteria are admitted to the CSC. We studied 49 parameters readily available within 24 hours after AIS.
Results: We registered 2554 AIS patients, 1788 (70%) agreed to participate of whom 593 (33,2%) received MT. 3 months follow-up was available for 562 (95,11%). 366 (65.1%) were transferred by DS and 196 by MS. Prior to MT 232 DS patients (63,4%) received IVT compared to 92 MS (46,9%), p=0.00017. Time lapse from stroke onset to groin puncture was 339,2±127,5 minutes in DS vs. 277,2±203 in MS, p=0.000011. The two groups did not differ in other studied parameters including 90-day morality (DS: n=78 [21.3%] vs MS: n=54 [27.5%], p=0.096), or good outcome (DS: n=219 [59.8%] vs MS: 108 [55.1%], p=0.28).
Conclusions: Real life data from the CSC in Krakow deliver similar outcomes at day 90, both in DS and MS models.
Disclosure of interest: Yes

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

1207

Effectiveness of an SMS reminder to obtain patient-reported outcomes: evidence from the Australian Stroke Clinical Registry

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Background and aims: Collecting patient-reported outcomes in registries is usually by mail or telephone surveys. Our aim was to determine whether SMS reminders to complete a survey by registrants in the Australian Stroke Clinical Registry (AuSCR) improved survey completion outcomes.
Methods: Eligible registrants from hospitals with ethics approval for this registry-based Randomized Controlled Trial (n=27/63) were randomly assigned 1:1 to receive the outcomes survey via current method (two mail attempts and phone attempt beginning 90 days post-admission; standard group) or an SMS reminder with link for electronic completion four weeks following the first mail attempt, in addition to the standard follow-up method for non-responders. Descriptive statistics were used to compare within and between group differences.
Results: We randomized 1008 registrants, 1000 were included in the analysis, and 8 excluded post-randomization since ineligible for AuSCR. Groups were similar at baseline (58% male, median age 72 years). Overall, 553 registrants completed the survey; more from the SMS group responded (61% versus standard group 50%, p=0.001). Among the SMS group, 18% completed the survey electronically. These registrants were younger ($p<0.05$) than those who completed the survey via other methods. The SMS group also responded sooner (median 60 days, 95%CI 50, 68) than those in the standard group (74 days 95%CI 71, 78). Missing data (<1%) were similar between groups.
Conclusions: Use of an SMS to remind registrants to complete outcome surveys resulted in more surveys being completed in a shorter timeframe. This research also provides evidence of the feasibility of electronic data collection.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

1172

Short and long-term stroke predictors and outcomes after TIA: a prospective observational study evaluating the fast-track care model

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Background and aims: Fast-track TIA has been proved to reduce short-term stroke risk, but its impact on long-term stroke incidence, as well as the long-term stroke predictors after index TIA, are still poorly characterized. The aim of the study was to determine stroke predictors and short and long-term stroke and composite outcome (stroke, acute coronary syndrome, vascular death) incidence after TIA.
Methods: observational study on consecutive patients admitted to the emergency department of S. Orsola-Malpighi University Hospital, Bologna, Italy (August 2010-December 2017). 1035 TIA patients underwent urgent (24-h) fast-track work-up (neurovascular evaluation, extra and intracranial blood vessels study, brain CT/MRI, ABCD2 score, cardiologic assessment) and 3, 12, 60 month follow up.
Results: stroke incidence was 2.3%, 2.8% and 5.7% at 3, 12, 60 months, respectively. TIA recurrence, lacunar aetiology, dysarthria, motor defect and history of hypertension were independent 3, 12- and 60-month stroke predictors. Composite outcome occurrence significantly increased from 12 to 60-month follow up (from 4.54% to 9.76%). Fast-track TIA care model was related to 73% relative (95% CI, 57.3-83.2) and 6.3% absolute (95% CI, 4.4-7.8) 3-month risk reduction, with an overall NNT of 16 and of 7 in the $ABCD_2$ score 6-7 subgroup.
Conclusions: our study identified independent predictors of stroke occurrence after TIA and documented fast-track effectiveness in reducing the risk of stroke both at short- and long-term follow up.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

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Differences in performance of Thrombectomy-Capable Stroke Centers and Comprehensive Stroke Centers in a regional stroke system of care

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Background and aims: Thrombectomy-capable stroke center(TSCs) have been developed as primary stroke centers capable of performing thrombectomy. We aim to compare workflows and outcomes of TSCs and comprehensive stroke centers(CSCs) in a regional stroke system of care

Methods: Observational study that included patients with large-vessel occlusion treated with thrombectomy in Catalonia, Spain, from January 2019 to December 2021 at four TSCs located in non-urban areas and six CSCs located in urban areas. A propensity-score matching algorithm was used to match in a 1:2 ratio patients from TSCs and CSCs. Outcomes included time from onset to groin puncture, groin puncture to reperfusion, successful reperfusion rate (mTICI>=2B), and degree of disability at 90 days

Results: Of 2338 patients treated at CSCs, 788 patients were matched with 394 patients from TSCs based on their propensity scores. Time from onset to groin puncture (median, TSCs 184 minutes [IQR 140-280] vs CSCs 179 minutes [IQR 125-295]) and from groin puncture to reperfusion (median, TCCs 44 minutes [IQR 29-73] vs CSCs 45 minutes [IQR 26-71]) were similar. Successful reperfusion was achieved in 85% of patients in both groups. Patients treated at TSCs presented higher degrees of disability at 90 days than patients treated at CSCs (common odds ratio 1.37 95%CI 1.08-1.75).

Conclusions: In Catalonia, patients with large-vessel occlusion treated with thrombectomy at TSCs showed comparable workflows and procedural metrics than CSCs, but long-term prognosis seems to be worse. More studies are needed to explore the factors that influence the prognosis according to level of care.

Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

2055

REDEFINING DISABILITY: ADDED VALUE OF PROMS AFTER TIA AND MINOR STROKE

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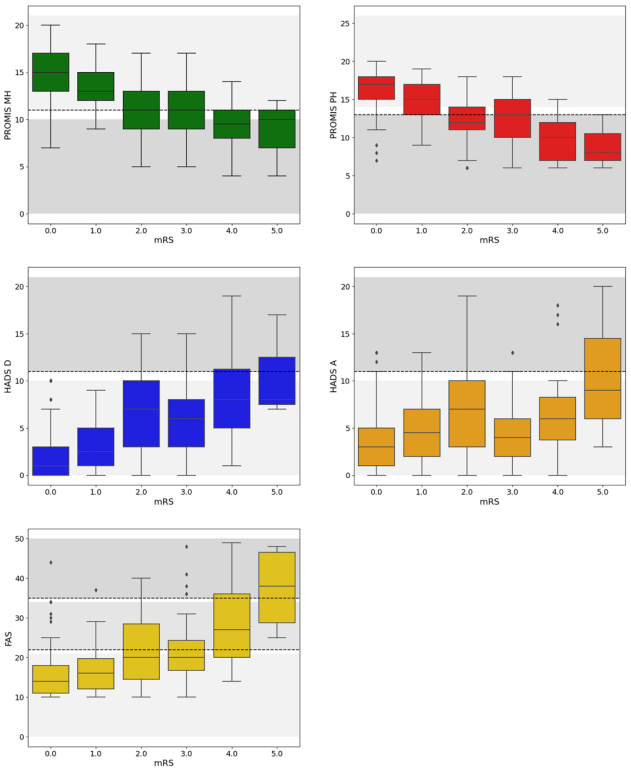
Background and aims: Long-term outcome assessment patients with stroke is not fully captured by usual clinical scales (eg. modified Rankin Scale (mRS)). Patient-reported outcome measures (PROMs) are standardized and validated assessments that consider clinical outcomes from the patient perspective. We aim to analyze the added value of PROMs in patients with transient ischemic attack (TIA) and minor stroke.

Methods: We included consecutive patients with minor ischemic stroke or (TIA) (NIHSS score 0–5) from October 2021 to October 2022 in 5 University hospitals that participated HARMONICS (a EU-funded High-value Stroke care project in Catalonia) that implements a PROMs-through-App program (NORA, NoraHealth Barcelona Spain). Clinician-evaluatedmRS and self-evaluated outcomes: the Hospital Anxiety and Depression Scale (HADS), the 10-item PROMIS Global Health survey (v1.2), and the Fatigue Assessment Scale (FAS).

Results: We included 620 patients.Response rate were: PROMIS, 47.7% (296); HADS 47.3% (293), FAS 47.1% (292), and self-assessed mRS 48.1% (298). Rate of abnormal PROMS scores were as follows (all responders versus self-reported mRS score 0–2): PROMIS mental health (23.8% versus 16.4%), PROMIS physical health (31.2% versus 22.6%); HADS-anxiety (10.4% versus 11.5%) and depression (8.4% versus 5.3%); and Fatigue Assessment Scale (26.5% versus 19.2%. PROMs scores correlated with mRS at 90 days (Figure)

Conclusions: Evaluation of PROMs using a mobile-app-based communication system is a reliable and valid strategy to assess the outcome of patients from their perspective after a mild stroke or transient ischemic attack. Up to one-third of "non-disabling" patients reported poor PROMs



Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

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Mental health conditions are associated with non-adherence to secondary preventive medication after stroke

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Background and aims: We aimed to determine whether Patient-Reported Outcome Measures (PROMs), sociodemographic characteristics, and clinical factors were associated with self-reported adherence to secondary preventive medication among stroke patients undergoing clinical follow-up using a mHealth app.

Methods: This observational retrospective study included all stroke patients who use a specific mHealth app (NORA) as part of their health control after discharge. Self-reported medication adherence was measured using the 4-item Morisky Medication Adherence Scale (MMAS-4) and the anxiety and depression by the Hospital Anxiety and Depression Scale (HADS). These measures were assessed over 1, 2, and 3 months after stroke. Sociodemographic and clinical data were also collected. Bivariate analysis was used to determine associated factors.

Results: 2255 stroke patients with a mean age of 71.9 (SD±13.7) years were included. A total of 20.3% were in treatment with oral anticoagulants, 30.6% with antihypertensive, and 50.3% with statins therapy. In total 84.9%, 85.7% and 87.1% were compliant over 1, 2, and 3 months. Self-reported anxiety in the past 30 days was associated with non-adherence to secondary preventive medication, whereas self-reported depression in the past 3 months were associated with non-adherence. Self-reported poor physical/mental health, health-related quality of life, age, BMI, LDL-cholesterol control, ranking scale, and previous stroke were not associated with non-adherence.

Conclusions: Preventable mental health conditions related to medication non-adherence were identified. These factors should be considered when assessing medication adherence among stroke patients.

Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

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Young Stroke Needs Study: Psychosocial Needs and Occupational Functioning in Young Stroke Survivors through PROMS

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Background and aims: Despite favorable functional outcomes in younger stroke survivors (<65), psychosocial and occupational functioning and QoL based on PROMs is not well established. Young Stroke Needs Study aims to evaluate health related QoL, physical, psychological, social well-being, and occupational outcomes to identify sociodemographic/clinical characteristics affecting them(phase1) and explore unmet needs/lived experience to inform post-stroke interventions development(phase2).

Methods: This is a *mixed-methods study* using a *sequential explanatory design*. Stroke patients <65yo, were recruited (10/19-04/21,mean 334d post-stroke) at the UHN, Toronto. Sociodemographic and clinical characteristics were collected through chart review, Neuro-QoL and a survey exploring post-stroke intervention preferences were collected through interviews. Descriptive statistics, sex-based and regression analysis were used to investigate the relationship between significant variables & impaired Neuro-QOL.

Results: Preliminary results (n=85,42%W, mean age 47,mean NIHSS 3, mRS 1, MOCA 28) show the highest impairment across NeuroQOL in ability to participate in activities (37%), anxiety (34%), and cognitive function (34%). Women had significantly worse depression, emotional, fatigue, stigma, and sleep scores than M, as well as significantly worse ability to participate in activities, satisfaction, and cognitive function scores. There was a significant difference in W viewing sense of self identify after stroke (0.05), with preference for cognitive behavioral therapy (0.018) and mindfulness-based stress reduction (0.016), while M preferred pharmacotherapy (0.02) for psychosocial symptoms.

Conclusions: Based on preliminary results, despite good functional outcomes, young stroke survivors have ongoing age and sex-specific needs that should be considered when designing longitudinal programs for optimizing long term outcomes and transitions of care.

Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

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SEX DIFFERENCES IN PREHOSPITAL IDENTIFICATION OF LARGE VESSEL OCCLUSION IN PATIENTS WITH SUSPECTED STROKE

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Background and aims: Differences in clinical presentation of acute ischemic stroke between men and women may affect prehospital identification of anterior circulation large-vessel occlusion (aLVO). We assessed sex differences in diagnostic performance of eight prehospital scales to detect aLVO.

Methods: We analysed pooled data from two prospective cohort studies (PRESTO and Leiden-PSS) conducted in the Netherlands between 2018-2019 in which ambulance paramedics included consecutive patients suspected of acute stroke who presented within 6h after symptom onset. Paramedics assessed clinical items from eight prehospital aLVO scales: LAMS, RACE, C-STAT, CPSS, PASS, G-FAST, CG-FAST, and FAST-PLUS. We assessed and compared diagnostic performance of scales for identifying aLVO at prespecified cut points for men and women.
Results: Of 2357 patients with suspected stroke (median age 73 years; 47% women), 231 (10%) had aLVO (100/1113 [9%] women and 131/1244 [11%] men). The area under the curve of the scales ranged from 0.72-0.78 in women versus 0.68-0.76 in men. Positive predictive values (PPV) ranged from 25%-35% in women versus 28%-41% in men, with RACE having the highest PPV in both sexes (35% in women and 41% in men). Negative predictive values were similar between sexes (95%-97% in women versus 94%-95% in men). Sensitivity of the scales was slightly higher in women than in men (0.56-0.70 versus 0.45-0.63), whereas specificity was lower (0.80-0.88 versus 0.84-0.91).
Conclusions: aLVO scales show comparable diagnostic performance in both sexes. The RACE scale may help optimize prehospital transport decision-making in men as well as in women with suspected stroke.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

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LOCATION-STRATIFIED SENSITIVITY OF PREHOSPITAL STROKE SCALES FOR IDENTIFYING PATIENTS WITH VESSEL OCCLUSIONS IN THE ANTERIOR CIRCULATION

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Background and aims: Prehospital stroke scales aimed to detect anterior circulation large vessel occlusions (aLVOs) may help to facilitate direct transportation of patients potentially eligible for endovascular thrombectomy (EVT) to an intervention center. Awaiting results of ongoing randomized-controlled trials, indications for EVT may expand to include medium vessel occlusions (MeVOs) in the near-future. The aim of this study was to investigate the sensitivity of eight prehospital stroke scales for different occlusion locations.
Methods: We analysed individual patient data from two prospective cohort studies (PRESTO and Leiden-PSS) conducted between 2018 and 2019. Paramedics assessed suspected stroke patients in the prehospital setting, which allowed reconstruction of eight prehospital stroke scales: RACE, LAMS, C-STAT, G-FAST, PASS, CPSS, CG-FAST and FAST-PLUS. We included adult patients with a diagnosis of ischemic stroke due to an underlying anterior circulation vessel occlusion. We calculated the sensitivity for different occlusion locations and calculated confidence intervals by means of 10,000 stratified bootstrap replicates.
Results: Among 3,320 patients with a suspected stroke, 271 (8.2%) had an anterior circulation vessel occlusion. Of these 271 patients, 26 (9.6%) had an ICA(-T) occlusion, 129 (47.6%) had an M1-occlusion and 116 (42.8%) had an M2-occlusion. Sensitivity was highest for M1-occlusions, ranging from 0.64 (95%CI:0.55-0.73) to 0.81 (95%CI:0.73-0.87). For ICA(-T) occlusions, sensitivity ranged from 0.46 (95%CI:0.25-0.67) to 0.61 (95%CI:0.39–0.78). Sensitivity for M2-occlusions was lowest, ranging from 0.36 (95%CI:0.26-0.45) to 0.55 (95%CI:0.45-0.64).
Conclusions: Prehospital stroke scales are more sensitive for aLVOs than for MeVOs. Development of tools to improve prehospital detection of MeVOs is warranted.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

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PROCESS MINING AS A WORKFLOW MONITORING TOOL IN ACUTE STROKE

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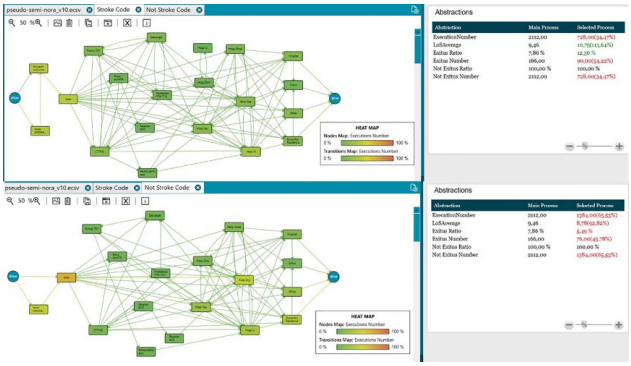
Background and aims: In acute stroke care, in-hospital organization has been demonstrated to improve clinical outcomes, reducing treatment-delays and complications. A global evaluation of the work-flow process may identify bottlenecks or flow alterations that can influence patient's outcomes. We aimed to test digital process mining for stroke workflow monitoring.
Methods: Through highly coupled multidisciplinary interactive data analysis carried out between health experts and data miners (interactive Process Mining Datarodeos), Interactive Process Indicators (IPIs) were built to define the typical stroke process workflows in our comprehensive stroke center, considering number of events in each of the steps of the process and timings between and in-steps. A qualitative evaluation of different IPIs was performed, and sources of differences were tested through statistical analysis.
Results: Data extracted from the structured electronical medical record of consecutive stroke patients admitted to our comprehensive stroke center from January 2021 to December 2022 were included. Two IPIs from patients with and without code-stroke activation were built (Figure). Through visual evaluation of both IPIs were detected that code-stroke patients were more frequently admitted to the Stroke Unit, have shorter door-to-CT times and had increased mortality, probably in the context of more severe strokes.
Conclusions: Process mining is a new tool that allows a global evaluation of health process through visual graphics. Real-time monitoring of relevant changes can be detected, allowing continuous improving strategies.



Disclosure of interest: No

BRAIN REORGANISATION AND RECOVERY

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Improved Post-Stroke Motor Recovery with Alternate Day Fasting in Mice

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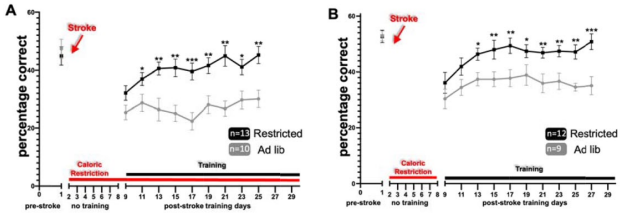
Background and aims: Caloric restriction promotes neuroplasticity and post-neurological injury recovery. In mice, we tested the hypothesis that caloric restriction can act post-stroke to enhance training-associated motor recovery.
Methods: Mice were trained to perform a skilled prehension task. We then induced a photothrombotic stroke in the caudal forelimb area, after which we retrained animals on the prehension task after an 8-day delay. Mice underwent either ad libitum feeding or alternate day fasting beginning 1-day after stroke and persisting for either 7 days or the entire post-stroke training period until sacrifice.
Results: Prior studies showed that post-stroke recovery of prehension can occur if animals receive rehabilitative training during an early sensitive period but is incomplete if rehabilitative training is delayed. In contrast, we show complete recovery of prehension, despite a delay in rehabilitative training, when mice underwent alternate day fasting beginning 1-day post-stroke and persisting for either the entire post-stroke training period (Figure A) or 7 days (Figure B). Recovery was independent of weight loss. Stroke volumes were similar across groups.
Conclusions: Poststroke caloric restriction led to recovery of motor function without a protective effect on stroke volume. Since prehension recovery improved even after ad libitum feeding was reinstituted, this suggests that the observed motor recovery was not merely a motivational response. These data add to the growing field that post-stroke caloric restriction can enhance recovery.



Disclosure of interest: No

BRAIN REORGANISATION AND RECOVERY

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Live effects of anodal and cathodal transcranial Direct Current Stimulation (tDCS) on glucose metabolism in a patient with chronic stroke: a FDG-PET study

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Background and aims: Transcranial Direct Current Stimulation (tDCS) is a non-invasive brain stimulation technique that applies a direct electrical current to the scalp to enhance or diminish neuronal excitability. Several studies have demonstrated its efficacy in improving motor and cognitive functions. We aimed to use Fluorine-18 fluorodeoxyglucose positron emission tomography (FDG-PET) to assess the live effect of tDCS on brain metabolism in a chronic hemorrhagic stroke patient.
Methods: We studied a patient with chronic right nucleo-capsular hemorrhagic stroke admitted to our Intensive Neurorehabilitation Care. The patient underwent the following protocol: baseline (T0) cerebral FDG-PET; cerebral FDG-PET during anodal-tDCS on the primary motor cortex of the affected hemishphere (T1); cerebral FDG-PET during cathodal-tDCS on the primary motor cortex of the unaffected hemisphere (T2). PET images were analyzed via SPM8 software: each processed image was compared with that of 19 healthy controls.

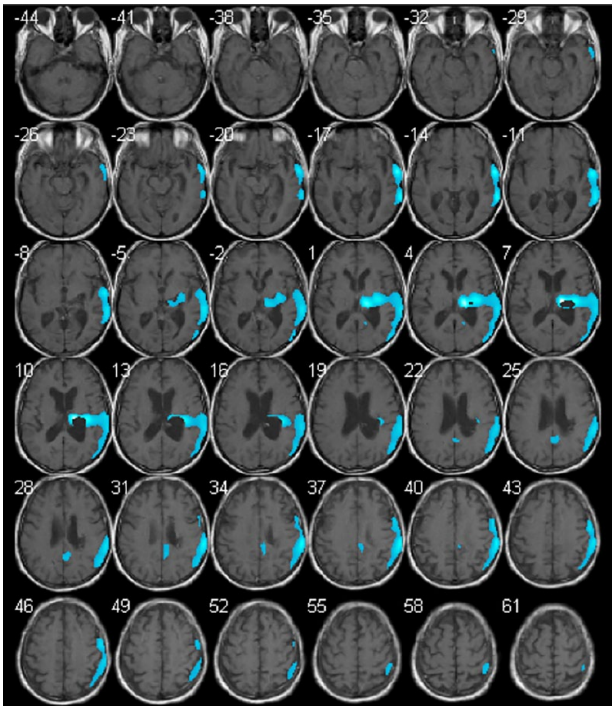

Fig. 1

Results: Baseline FDG-PET documented a marked hypomethabolism of the hemorrhagic right nucleo-capsular lesion ($p<0.01$) (Fig.1); T1 FDG-PET showed an increased brain metabolism of both stimulated hemisphere and non-stimulated hemisphere ($p<0.01$) (Fig.2); T2 FDG-PET documented a reduction of metabolism in the hemisphere ipsilateral to the inhibiting current applied by tDCS ($p<0.01$) (Fig.3).
Conclusions: To our knowledge this is the first FDG-PET study on live effects of tDCS in a stroke patient. The use of FDG-PET may unlock new insights on the effects of tDCS on brain metabolism. Further studies will further clarify the mechanisms of action in relation with the obtained functional outcomes.

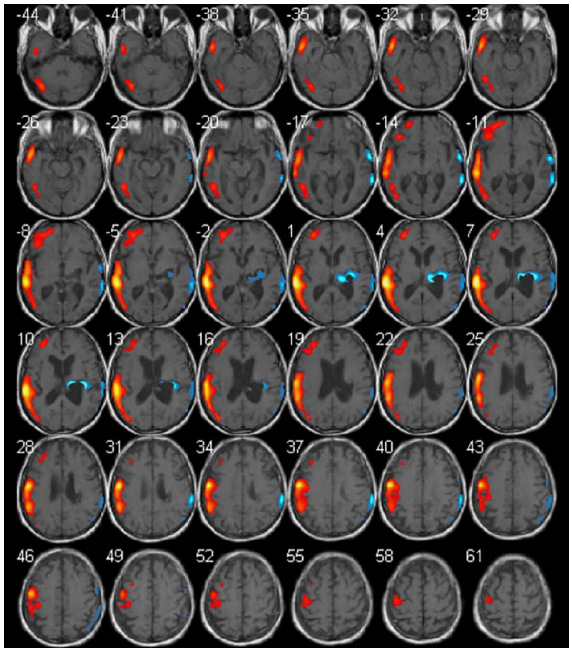

Fig. 2

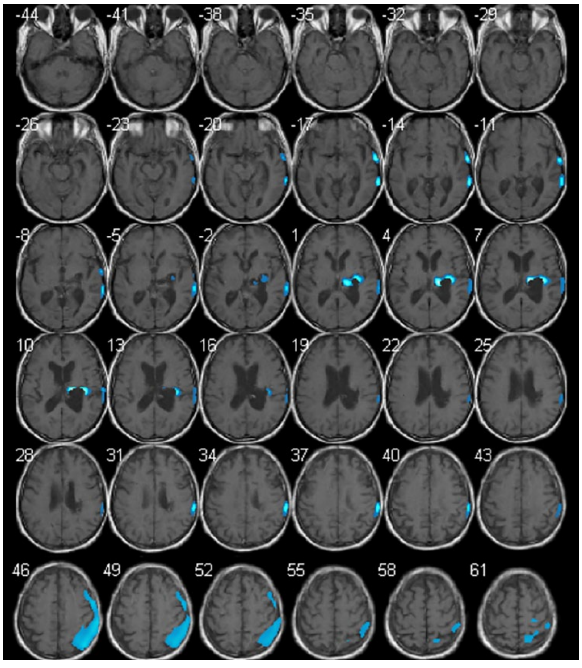

Fig. 3

Disclosure of interest: No

BRAIN REORGANISATION AND RECOVERY

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STEM CELL – BASED THERAPIES IN ISCHEMIC STROKE. SYSTEMATIC REVIEW AND META-ANALYSIS OF RANDOMIZED CLINICAL TRIALS

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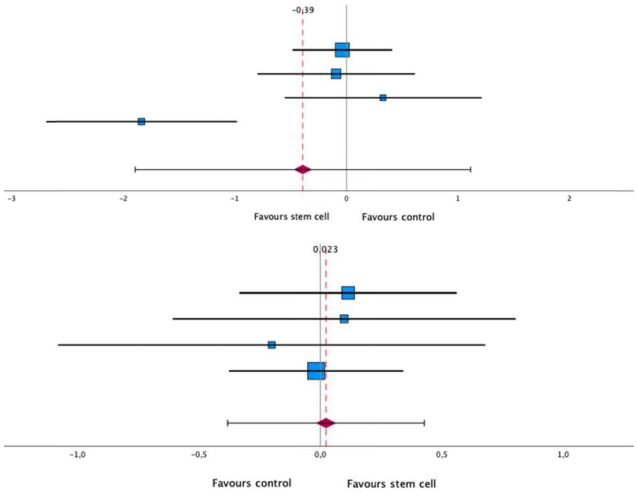
Background and aims: Stem cells–based therapies are a promising approach in order to reduce functional disability after ischemic stroke. Previous studies have shown that this therapy is safe, without conclusive results in terms of efficacy. We aim to explore the potential benefit by systematic review and meta-analyses.
Methods: We performed a systematic review in Pubmed database. Only randomized clinical trials were included. We reported pooled data using Cohen d or OR and Hartung-Knapp adjustment for random-effects model. Heterogeneity was assessed by X^2, I^2 and Tau^2 statistics. We assessed mRS 0-2; and NIHSS, Barthel Index (BI) and mortality, at three- and six-months follow-up.
Results: We identified nine studies. Regarding to NIHSS, we included four articles (80 experimental vs 78 control). There was no difference between groups (d=-0.39 [-1.89, 1.11; CI 95%]; p=0.47), with significative heterogeneity (I^2=0.85; Tau^2=0.71; p=0.001). Regarding to BI, we analyzed four studies (125 treated vs 123 control). No difference was detected (d=0.023 [-0.38, 0.43; CI 95%]; p=0.87). About mRS, three studies were included (143 experimental vs 114 control), without significant difference (OR=0.13 [-0.51, 0.77; CI 95%]; p=0.47). BI and mRS did not show heterogeneity (I^2=0; Tau^2=0; p=0.092 and I^2=0; Tau^2=0; p=0.75; respectively). Assessing mortality (206 experimental vs 220 control), there was no difference (OR=-0.51 [-1.34, 0.32; CI 95%]; p=0.18); without heterogeneity.
Conclusions: Our study reaffirmed the safety of cell-therapy. However, disability reduction was not demonstrated. These data have to be



interpreted cautiously due to missing data. Besides, they could be influenced by cell issues or lesion volume.
Disclosure of interest: No

TECHNOLOGY INNOVATIONS: ROBOTS, VIRTUAL REALITY, ARTIFICIAL INTELLIGENCE AND MORE

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An interactive and automated tool for the Modified Rankin Scale assessment – iRankin

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Background and aims: The Modified Rankin Scale (mRS) is a widely adopted scale for assessing disability in neurological patients. It has been adopted as a primary outcome of most recent clinical trials in Vascular Neurology. Designed to be used by either medical or paramedic staff, the congruency of this scale could be more consistent, which may lead to severe mistakes in assessing accurate healthcare-quality indicators and research results. We aimed to describe and validate an interactive and automated tool for evaluating the mRS among healthcare providers.
Methods: A panel of five board-certified and mRS-trained vascular neurologists designed the automated algorithm based on current literature. Two internationally recognized neurologists were consulted to test the algorithm. The panel wrote five vignettes, and five real cases were recorded for the validation step. We invited the neurological staff from six stroke centers to answer a digital form. The participants were automatically randomized into two groups (1:1 proportion, control x iRankin users). Then, the participants were randomly allocated in pairs regarding the congruency analysis.
Results: A total of 59 professionals answered the form. The weighted-Kappa for the iRankin group and control was 0.7(0.44-0.95) x 0.63(0.38-0.88) (General Neurologists), 0.85(0.73-0.97) x 0.55(0.16-0.95) (Neurology Residents), 0.87(0.72-1) x 0.82(0.66-0.98) (Vascular Neurologists), 0.76(0.55-0.97) x 0.30(0.07-0.67) (Nurses), 0.85(0.7-1) x 0.68(0.45-0.9) (Occupational Therapists) and 0.75(0.56-0.94) x 0.59(0.18-1) (Physical Therapists), respectively.
Conclusions: Adopting our algorithm led to a substantial ($\hat{k} \geq 0.61$) or near-perfect agreement ($\hat{k} \geq 0.81$) in all analyzed professional categories. This user-friendly, accurate and free algorithm is available at www.irankin-scale.com.
Disclosure of interest: No

TECHNOLOGY INNOVATIONS: ROBOTS, VIRTUAL REALITY, ARTIFICIAL INTELLIGENCE AND MORE

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SAMPLE SIZE ESTIMATION METHODS FOR ORDINAL ANALYSES OF THE MODIFIED RANKIN SCALE: A SYSTEMATIC INVESTIGATION, RECOMMENDATIONS, AND ONLINE AND DOWNLOADABLE TOOL FOR PRACTICAL USE

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Background and aims: Several methods for sample size estimation of studies with outcomes across the full ordinal mRS are proposed in the literature. No systematic comparison of accuracy, agreement, and sensitivity to small changes in hypothesised effect sizes for these methods is available. Our aim is to conduct such a systematic comparative analysis and to introduce a comprehensive freely available online tool to facilitate appropriate power analyses for ordinal outcomes.
Methods: We used numerical experiments utilizing combinations of previously published control data from acute and recovery stroke trials and hypothetical treatment effects to systematically validate and compare the accuracy and sensitivity of published ordinal power formulas methods. We also developed an online and downloadable app facilitating sample size calculation for, and ordinal analysis of, mRS data.
Results: Tang's Wilcoxon-Mann-Whitney power formula exhibited the highest accuracy. All analysis methods demonstrated almost identical empirical power for a given sample size. All power methods exhibited sensitivity to small changes in hypothesised effect size. The developed tool supports analytical and visualisation requirements for all investigated methods for power and statistical analyses of ordinal mRS outcomes.
Conclusions: Stroke researchers should use Tang's power formula for sample size estimation when designing studies with outcomes measured on the full or partially collapsed mRS scale as well as other ordinal scales, even if they intend to use other ordinal methods for their primary outcome analysis. Conducting sensitivity analyses of the effect size assumptions are essential for appropriate sample size estimation. Our developed tool supports and facilitates both recommendations.
Disclosure of interest: No

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Use of the digital assistant "Vigo" at home environment for stroke recovery: focus group discussion with rehabilitation specialists

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Background and aims: Tablet-based therapeutic programs present an alternative way to access rehabilitation services and show a new paradigm for providing therapeutic interventions following stroke. It is important to explore opinion of professionals working in neurorehabilitation, in order to integrate the tool into clinical practice. The aim of this study is to identify the requirements for a tablet-based home program for stroke recovery from a specialist working in stroke rehabilitation perspective.
Methods: A qualitative exploratory study using focus group interviews was conducted to explore specialists' attitudes, experience and expectations about the use of the digital assistant "Vigo" as home-based rehabilitation program for stroke recovery in domains of application's functionality, compliance, usability and content.
Results: Seventeen professionals agreed to participate in the study. In total four themes were identified: 1) clinician's views on using Vigo as a home-based rehabilitation system; 2) patient related circumstances facilitating and limiting the use of Vigo; 3) Vigo application functionality and its use process (program creation, individual use, remote support; 4) complementary and alternative Vigo use perspectives. Last three themes were divided totally in 10 subthemes and two subthemes had two sub-subthemes each.
Conclusions: Healthcare professionals' attitude towards the usability of the application was positive. It is important that the content and use of the application is coherent with the aim of the program and it can be integrated clinical practice and avoid misuse of the application. Therefore, involvement of rehabilitation specialists in the process of the development and research process is very important.
Disclosure of interest: No

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PATIENT EXPERIENCE FROM USING WEARABLE ACCELEROMETERS FOR STROKE DETECTION IN THE STROKE ALARM PRO I STUDY

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Background and aims: Rapid identification and treatment of acute stroke is of utmost importance. We explored patient experience from using a wearable stroke detection system in the community.
Methods: Consecutive patients with acute ischemic stroke or TIA at Skåne University Hospital during a 10-week period were included in the STROKE ALARM PRO I study $<$14 days after their index event. The study aimed to explore feasibility including user experience from 30 days' system use.
STROKE ALARM consists of paired arm bracelets with accelerometers detecting sudden imbalances in arm movements indicative of stroke and triggering notifications by SMS to predefined emergency contacts. Patients were followed up by telephone interview.
Results: Of 30 included patients, 28 completed 30-day follow-up. Median age was 68 and 37.6% were female. None had a new ischemic event. Overall, 64.2% were positive/very positive to using the device, 25% were neutral, 10.7% were negative. Seventeen patients (61%) reported an increased sense of security and control, while four patients specifically reported an increased sense of security for their next of kin.
On the negative side, 15/28 (53.6%) reported that false alarms at times led to increased anxiety, stress or disturbed sleep. Five patients specifically reported increased stress for next of kin when false alarms were sent. A minority reported battery issues (n=4), or discomfort from the bracelets (n=4).
Conclusions: Most patients were positive to wearing the STROKE ALARM detection system, often leading to an increased sense of security. False alarms were frequent and sometimes perceived as negative and stressful.
Disclosure of interest: No

TECHNOLOGY INNOVATIONS: ROBOTS, VIRTUAL REALITY, ARTIFICIAL INTELLIGENCE AND MORE

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Stent-Retriever With Novel Double-Fusiform Cell Technology Improves Efficacy of Thrombectomy

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Background and aims: First pass effect (FPE), complete recanalization after a single thrombectomy attempt (single pass), leads to superior outcomes and is the procedural objective of mechanical thrombectomy. Currently available devices achieve FPE in <50% of patients. Gravity stent-retriever incorporates novel double-fusiform cell technology (higher pressure per strut for better clot engagement and spatially variable radial force for flexibility and kink-resistance; Figure1). We aim to evaluate the efficacy of Gravity stent-retriever and compare it with existing stent-retrievers.
Methods: We used a moderately tortuous in-vitro ischemic stroke bench model (Mentice) and placed soft and hard synthetic clots (Biomodex) in the proximal M1 segment of the middle cerebral artery (MCA). We assessed the rates for FPE and final complete recanalization (FCR; after 3 passes) of Gravity (4x42mm, Gravity Medical Technology) and compared it with Solitaire X (4x40mm, Medtronic).
Results: For soft clot, rates of FPE (60% vs. 50%, p=0.40) were numerically higher and FCR (90% vs 90%, p=1) were comparable. For hard clot, rates of FPE (20% vs 0%, p=0.47) and FCR (40% vs 0%, p=0.08) were numerically higher. Median passes required to achieve complete recanalization were numerically lower for soft clots (1.4 ±0.5 vs 1.7±0.8, p=0.17). There were no FCR with Solitaire X in the hard clot group. (Table1)
Conclusions: Gravity stent-retriever, characterized by double-fusiform cell technology, has the potential for superior efficacy with soft and hard clots.

Figure 1. Representation of Gravity stent-retriever

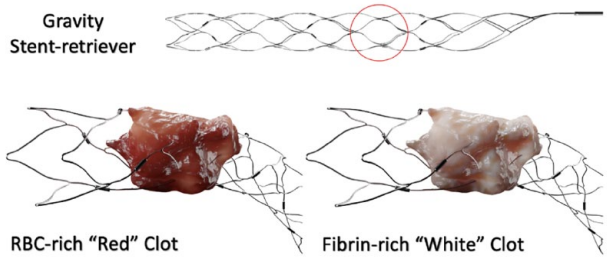

Table 1. Rates of First Pass Effect (FPE) and Final Complete Recanalization (FCR) for Soft and Hard Clot

	Gravity	Solitaire X	P value
Soft Clot			
% First Pass Effect	60% (6/10)	50% (5/10)	0.40
% Final Complete Recanalization (FCR)	90% (9/10)	90% (9/10)	1
Mean passes for FCR	1.4 ±0.5	1.7±0.8	0.17
Hard Clot			
% First Pass Effect	20% (2/10)	0% (0/10)	0.47
% Final Complete Recanalization (FCR)	40% (4/10)	0% (0/10)	0.08

Disclosure of interest: No

TECHNOLOGY INNOVATIONS: ROBOTS, VIRTUAL REALITY, ARTIFICIAL INTELLIGENCE AND MORE

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EFFECT OF FEDERATED LEARNING ON POST-HOC EXPLAINABILITY OF STROKE OUTCOME PREDICTION MODELS

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Background and aims: The accelerating application of AI in healthcare triggered growing efforts in evaluating solutions by a multitude of measures beyond prediction performance such as privacy or explainability. Even though many technical advancements have been proposed in recent years for these concerns, the effect on their interplay is insufficiently studied. In the current work we analyzed if Federated Learning (FL) – a popular privacy-preserving technique for training multi-center models – influences explainability of models.
Methods: We used clinical information of ischemic stroke patients (n=370) from the MRCLEAN study and simulated a FL scenario by separating data from the six largest participating centers. Neural Network models were trained to predict dichotomized mRS (favourable <= 2). We compared feature importance rankings between classical training with all data, federated training and further fine-tuning a federated model on each centers' data separately.
Results: The federated setting yielded slightly lower performance of 0.73 AUC on the test set compared to the 0.77 AUC of classical training. The three highest ranking variables in classical training were "NIHSS", "age" and "intra-arterial treatment". In the federated setting, "hypertension" took over "age" and "intra-arterial treatment" dropped to last. When fine-tuning the federated model, "hypertension", "hypercholesterolemia" and "gender" became more prominent while "age" and "intra-arterial/ thrombolysis treatment" dropped significantly.
Conclusions: Our analysis and results suggest that FL can benefit privacy while retaining performance, however it might lead to learning different contributions of variables. Thus, we caution for close assessment of explainability of FL models and encourage further research in this direction.
Disclosure of interest: No

TECHNOLOGY INNOVATIONS: ROBOTS, VIRTUAL REALITY, ARTIFICIAL INTELLIGENCE AND MORE

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Accuracy of Smartwatches to Detect Atrial Fibrillation by Heart Rate Monitoring and Irregular Rhythm Notification in Stroke Patients

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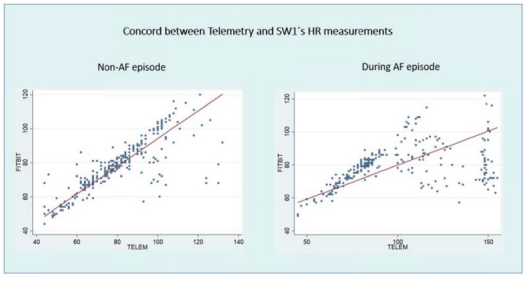
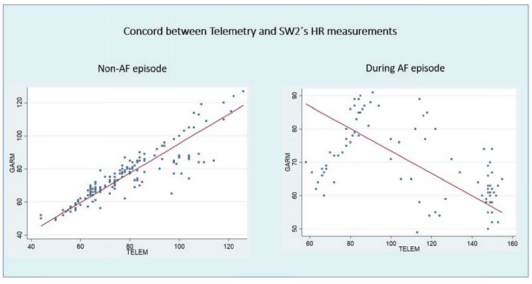
Background and aims: Commercially available smartwatches can be a helpful tool in screening atrial fibrillation (AF). However, validation studies in stroke patients remain scarce. We aim to assess the validity of heart rate (HR) data from smartwatches with simultaneous recordings from telemetry monitoring (TLM), included the performance of irregular rhythm (IR) notification function.
Methods: A cross-sectional study was carried out by collecting resting HR measurements (every 5-minute) using two smartwatches (SW1/SW2) along with TLM in hospitalized stroke patients. Concordance class correlation (CCC; CCC>0.8 acceptable correlation) and Bland-Altman analyses were calculated to assess agreement between devices versus TLM. Accuracy was assessed using mean absolute percent error (MAPE; MAPE<10% acceptable accuracy). IR notification (SW1) performance was compared with automated AF detection TLM to screen AF. Factors improving monitoring performance were evaluated.
Results: A total of 526 individual pairs of measurements were obtained from 70 stroke patients aged 79.4 years (SD±10.2), 63% females, BMI 26.9 (SD±5.8), and NIHSS 10 (IQR 3-20). Both devices provided low accuracy and weak agreement compared to TLM recording regarding HR measurements during AF episode and HR >100 bpm at rest (Table 1). For IR notification, SW1 achieved good performance versus TLM with sensitivity of 34% and specificity of 100%. Monitoring performance does not differ by age, gender, BMI, NIHSS score, or HR >100 bpm.
Conclusions: Smartwatch irregular rhythm notification function over resting HR measurement was acceptable to guide decisions about AF screening in stroke patients.

Table 1.
Descriptive examination of the accuracy between smartwatches by condition when compared with the telemetry

Condition	Device	MAPE (%)	CCC	95% IC
HR during AF episode	SW 1	16.5 ± 17.9	0.211	0.148 to 0.273
	SW 2	30.3 ± 25.7	-0.133	-0.193 to –0.074
HR >100 bpm at rest	SW 1	25.2 ± 18.5	-0.117	-0.173 to -0.061
	SW 2	37.9 ± 22.4	-0.139	-0.202 to –0.075





Disclosure of interest: No

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Deep learning for macroscopic analysis of retrieved thrombi: an answer from artificial intelligence to diagnostic workup

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Background and aims: Ischemic stroke represents 85% of all types of stroke. Up to 30% of them are classified as cryptogenic stroke despite an extensive assessment. Macroscopic characterization of the retrieved thrombi after mechanical thrombectomy would allow establishing associations to gain a useful diagnostic tool in determining the etiology of large vessel occlusion strokes. The aim of this study is to analyze pictures of fresh clots by advanced digital imaging and deep learning techniques to classify the samples as atheromatous or cardiac sources.
Methods: For this study we analyzed 86 color pictures (640 x 480 pixels) previously classified as atheromatous (24), cardiac (52) and cryptogenic (20). These pictures were divided into three data sets for training, validation and test of the machine learning model. The analysis was made in two-stage process: segmentation and classification. On the segmentation stage a neural network type UNET2D was developed to delete picture background. On classification stage a convolutional network was employed to classify segmented pictures into two categories: atheromatous and cardiac sources.
Results: The segmentation network showed a success rate of 98%. Classification network obtained an accuracy rate of 79% (100% for clots of cardiac source, and 71% for those of atheromatous origin).
Conclusions: This exploratory study suggests that using artificial intelligence techniques is possible to classify clots by its macroscopic appearance and therefore to gain a possible diagnostic tool to eventually reduce the number of cryptogenic strokes.

Disclosure of interest: No

TECHNOLOGY INNOVATIONS: ROBOTS, VIRTUAL REALITY, ARTIFICIAL INTELLIGENCE AND MORE

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PREDICTING PROGNOSIS OF ACUTE ISCHEMIC STROKE THROUGH ARTIFICIAL INTELLIGENCE: A NOVEL APPROACH BASED ON REAL WORLD DATA

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Background and aims: Prognosis assessment in acute ischemic stroke patients is challenging. Our aim is to investigate the efficacy of machine learning methods to reliably predict the clinical severity at discharge from hospital at the moment of patients admission into the emergency department.

Methods: We tested different artificial intelligence (AI) approaches (XGBoost, random forest, and support vector machine regressors) in 715 patients randomly divided into a training cohort (537) and a testing cohort (178). We tested the ability of AI to predict the variation of NIHSS at discharge compared to NIHSS at admission. We accepted a difference of $\leqslant 3$ points between the predicted and the observed NIHSS variation when the initial NIHSS score was <5 and a difference of $\leqslant 4$ points when the initial NIHSS was $\geqslant 5$. For each model, we evaluated the prediction accuracy through the number of patients correctly predicted. Moreover, we calculated the median absolute error and mean absolute error of the regression.

Results: XGBoost emerged as the best machine learning model with an accuracy of 0.61, mean absolute error of 4.35 and median absolute error of 3.0 in the testing cohort (Figure 1). The results show that NIHSS at admission, evidence of ischemic lesion in the first CT scan, age and M1 occlusion are the most significant predictors of the NIHSS variation (Figure 2).

Conclusions: In conclusion, the XGBoost regression model applied at the moment of patients admission shows promising results in predicting NIHSS variation at discharge.

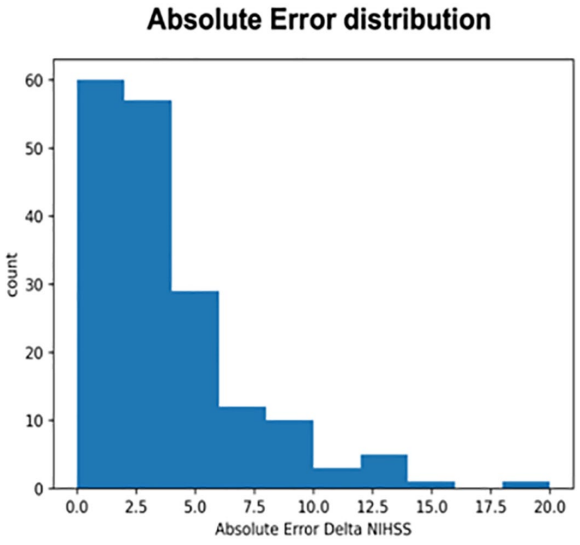

Fig 1. Absolute error distribution.

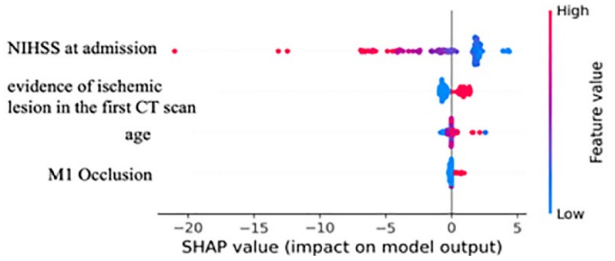

Fig 2. SHAP diagram.

Disclosure of interest: No

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MRI BASED OUTCOME PREDICTION WITH DEEP LEARNING IN ISCHEMIC STROKE - CLOSING IN ON THE PREDICTIVE POWER OF CLINICAL VARIABLES

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Background and aims: The clinical workflow in ischemic stroke is mainly driven by image interpretation. However, previous research in imaging-based stroke decision support remained limited to automation of established biomarkers (e.g. ASPECTS) or lesion delineation; no major success has been achieved in predicting outcomes.

The current work aimed at bridging this gap and exploring the potential of outcome prediction using exclusively MRI data.

Methods: We analysed 417 patients from the 1000Plus study with available baseline DWI and FLAIR imaging and confirmed supratentorial ischemic stroke confirmed on DWI. The 3D images were co-registered and mutually fed to the DL networks. We applied a CapsuleNetwork - known to capture locality information -, a standard Convolutional Neural Network (CNN) and an embedding approach to combine the best of both worlds. All image models were benchmarked against a Neural Network (NN) using age (mean=68.7), sex (female=165), thrombolysis (n=85), pre-stroke care (mode=0), NIHSS (median=2), hypercholesterolemia(n=249), diabetes(n=103), hypertension(n=339), previous stroke (n=111), atrial fibrillation (n=112), time-to-MRI (mean=675.1min). Networks were trained to predict dichotomized 90 days mRS (favourable $<= 2$, n=305).

Results: The clinical model achieved an average test AUC of 0.774 compared to an AUC of 0.778 and 0.764 for the CNN and CapsuleNetwork respectively. The ensemble approach had the highest AUC with 0.784.

Conclusions: We hereby showed promising results of DL networks, that matched the predictive performance of clinical variables solely from image data. Our approach can provide complementary information when clinical data is not available and feeds research of novel imaging markers of outcome. This is a crucial step towards personalized decision support.

Disclosure of interest: No

TECHNOLOGY INNOVATIONS: ROBOTS, VIRTUAL REALITY, ARTIFICIAL INTELLIGENCE AND MORE

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Automatic tortuosity assessment of extracranial vascular anatomy and impact on mechanical thrombectomy

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Background and aims: Accurate assessment of vascular tortuosity could yield crucial information for endovascular treatment in stroke ahead of intervention. We developed and validated an automatic feature extraction method, and we use it here to study the relationship between tortuosity and procedural variables linked to difficult interventions.
Methods: An automatic software integrating segmentation, centerline extraction and vessel labelling was used to extract features directly from computed tomography angiograms (CTA) of stroke patients undergoing transfemoral endovascular treatment. Tortuosity index (TI) of the ipsilateral extracranial carotid artery (CA), TI of the proximal 5cm of the CA, bovine aortic arch and aortic arch type (AAT) were used as tortuosity features. Patients were binarized according to five procedural variables: time to first angiography, time to first pass, time to recanalization, final mTICI and FPE.
Results: 466 patients (51% female, 74.8±12.9yr) with anterior circulation large vessel occlusion were included in this study. Patients with a time to first angiography >17min (fourth quartile) displayed higher CA TI ($p<0.001$) than those <=17min (IQR: 0.29[0.23-0.36] vs 0.24[0.20-0.30]), a result which held for M1 and M2 occlusions, but not for ICA. For patients with M2 occlusions, AAT of class III was associated to longer time to first pass and time to revascularization ($p<0.05$, 42[21-75]min vs 25[18-45]min).
Conclusions: An automated software was successfully used to characterize anatomical vascular features from CTA. For distal M2 occlusions, unfavorable AAT resulted in longer procedural times. This information could potentially be used to improve endovascular treatment in stroke.
Disclosure of interest: No

TECHNOLOGY INNOVATIONS: ROBOTS, VIRTUAL REALITY, ARTIFICIAL INTELLIGENCE AND MORE

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CAN AN ELECTRONIC HEALTH RECORD-BASED EXTERNAL APIXABAN CONTROL ARM ACCURATELY REPLICATE THE OUTCOMES OF THE PHASE 2B PACIFIC-AF TRIAL?

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Background and aims: PACIFIC-AF (NCT04218266) phase 2b RCT compared the safety of asundexian (oral FXIa inhibitor) with apixaban in individuals with AF. We investigated whether an electronic health record (EHR)-based apixaban external control arm (ECA) approach could accurately replicate the occurrence of outcomes of International Society on Thrombosis and Haemostasis (ISTH) major and/or clinically relevant non-major (CRNM) bleeding observed in PACIFIC-AF and project outcome rates beyond trial duration.
Methods: A cohort of 176,152 patients satisfying PACIFIC-AF eligibility criteria was identified within the US Optum® de-identified Electronic Health Record dataset (2013-2019). Upon PACIFIC-AF completion, 250 patients receiving 5mg or 2.5mg of apixaban twice daily were included. Eligible EHR cohort patients (constituting apixaban ECA) were matched 1:1 to PACIFIC-AF apixaban patients by propensity score (PS). An absolute standardized difference (ASD) <0.10 for all PS model covariates was considered representative of adequate balance. Number of clinical outcome events were assessed at 12 weeks (*a priori* outcome assessment timepoint in PACIFIC-AF).
Results: Following matching, the apixaban ECA and PACIFIC-AF apixaban control arm were similar (ASD <0.10) for all 102 covariates included in the PS model. Over 12 weeks, 8 apixaban ECA patients experienced the primary composite outcome (1 ISTH major, 7 CRNM bleeding) compared with 6 patients in the PACIFIC-AF apixaban control arm (0 ISTH major, 6 CRNM bleeding).
Conclusions: An apixaban ECA derived using real-world data identified bleeding rates that were consistent with those observed in the PACIFIC-AF apixaban control arm.
Acknowledgements: Editorial support provided by Oxford PharmaGenesis Ltd, funded by Bayer AG.
Disclosure of interest: Yes

TECHNOLOGY INNOVATIONS: ROBOTS, VIRTUAL REALITY, ARTIFICIAL INTELLIGENCE AND MORE

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Accurate and Fully Automatic Occlusion Detection using Multiphase CT Angiography Perfusion

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Background and aims: Computed Tomography Angiography (CTA) is standard care in patients with acute stroke and is used to detect thrombus location and assess collaterals. CT Perfusion allows clinicians to additionally assess extent and severity of ischemia. In this work, we evaluate StrokeSENS Multiphase CT Angiography Perfusion (mCTAp), a technique that enables perfusion imaging with addition of two low-dose scans to the standard CTA workflow, in its ability to detect occlusion.
Methods: We included 148 subjects with baseline Non-contrast CT and mCTA, including 86 large-vessel-occlusion (LVO-MCA=59; LVO-ICA=24; LVO-PCA=3), 40 medium-vessel-occlusion (MeVO-MCA=33; MeVO-PCA=4; MeVO-ACA=3) and 22 no-occlusion cases. StrokeSENS mCTAp relative delay (rDelay) maps were generated, containing lesion masks at 4

hypoperfusion severity levels (rDelay>170%; >220%; >270%; >320%). Subject was deemed occlusion positive when hemispherical lesion volume difference was above a certain threshold. ROC curves were produced by varying this threshold. We produced 4 ROC curves, one for each of the 4 mCTAp rDelay hypoperfusion levels and reported the respective area-under-the-curve (AUC) performance. Optimal threshold was operationalized (OP) using Youden index, and sensitivity (Sen) and specificity (Spe) at the OP were reported

Results: Occlusion detection AUC was highest at rDelay>220%, with AUC=93%. At the OP, Spe=95% (95%CI:[78%, 99%]),Sen=83% (95%CI:[76%, 89%]). Table 1 shows true and false-positives and negatives for occlusion detection at the OP. Figure 1 shows example mCTAp rDelay maps, and Figure 2 shows the 4 produced ROC curves.

Conclusions: StrokeSENS Multiphase CT Angiography Perfusion Occlusion Detection has been shown to accurately detect occlusion based on its downstream perfusion effect.

Table 1: Confusion Matrix of mCTAp rDelay>220%

	Predicted-	*Predicted+*
Actual-	21	1
Actual+	22	104

Figure 1: mCTAp rDelay discretized at 4 different hypoperfusion levels (green: rDelay>170%, yellow: rDelay >220%, orange: rDelay>270%, red: rDelay>320%

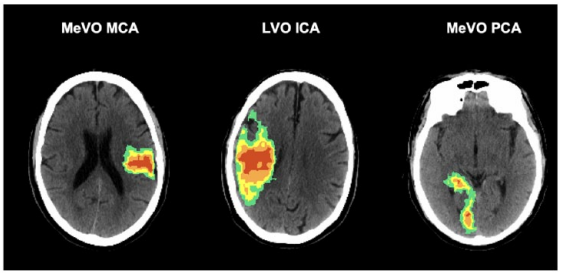
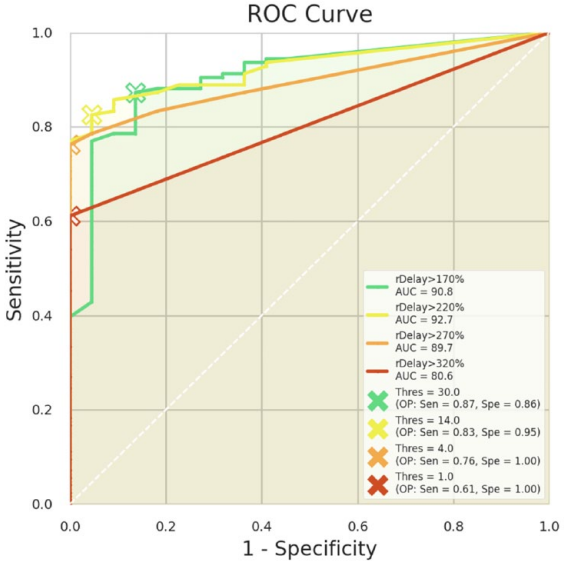


Figure 2 : ROC curves of rDelay>170%, rDelay>220%, rDelay>270% rDelay>320%.



Disclosure of interest: Yes

TECHNOLOGY INNOVATIONS: ROBOTS, VIRTUAL REALITY, ARTIFICIAL INTELLIGENCE AND MORE

1968

Novel biomarker for assessing biological age of ischemic stroke lesion on unenhanced CT

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Background and aims: Biomarkers of ischemic stroke lesion progression guide selection of acute therapies. Extracting this information from unenhanced computerised tomography (UECT) offers convenience and speed compared to CT perfusion or MRI. The current method for assessing acute ischemic lesion age from UECT involves measuring relative intensity ("net water uptake"). Here, we determined an optimal UECT imaging biomarker for assessing lesion age, utilising a deep-learning approach, trained upon chronometric time from symptom onset.

Methods: A training set of 783 acute/subacute ischemic lesions on UECT were used to develop imaging Convolutional Neural Network (CNN) models for: i) automated ischemic lesion segmentation; and ii) estimating Onset Time to Scan (OTS). An independent validation set of 2000 lesions was used to determine accuracy of CNN models for: i) lesion segmentation versus experts; ii) OTS estimation; iii) ischemic penumbra/core volume ratio; and iv) infarct growth over 24 hours. Tests (ii) – (iv) were compared with Relative Intensity (RI) models.

Results: Automated lesion segmentation was judged appropriate by experts in 91% of cases. Automated lesion volume correlations with expert consensus was R^2=0.78, and 0.91, for acute and subacute lesions. Prediction of OTS using CNN, and RI models were R^2=0.59 and 0.31 respectively. Correlations of penumbra/core ratio with CNN-estimated OTS, RI, and actual OTS, were: R^2=0.37, 0.20, and 0.11; and for ischemic lesion growth versus the 3 models were: R^2=0.28, 0.13, 0.10, respectively.

Conclusions: A UECT deep-learning model of ischemic stroke lesion biological age significantly outperforms models based upon relative intensity, or chronometric age.

Disclosure of interest: Yes

CASE REPORTS

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Basilar artery re-occlusion (RE-BAO): combination treatment of mechanical thrombectomy (MT), bridging and intra-arterial thrombolysis (TPA)

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Background and aims: BAO is the most devastating stroke localization, with only recently proved effectiveness of MT as treatment (ATTENTION trial).

Methods: We present 52 year old male patient with acute BAO (skew-deviation, right hemiparesis, comatose) and ostial stenosis with

distal dissection of left vertebral artery (VA). Intravenous TPA was given followed by MT with residual both superior cerebellar arteries (SCA) occlusion. Procedurally, after exclusion of brain hemorrhage on cone-beam MSCT, we applied 8 ml of intra-arterial TPA as rescue therapy with initial SCA recanalization. Patient had complete neurological recovery with a small mesencephalic and occipital ischemia and occlusion of left SCA on MRI. Next day patient suffered RE-BAO stroke with NIHSS 18. Again, bridging TPA was applied and referred to angiosuite to second MT with residual TICI 3 score. MT was both times performed atypically through external carotid artery and anastomosis via occipital and VA. Ultrasound examinations revealed ostial stenosis of left VA with gradual regression of distal dissection. Initially antithrombotic was given, however due to RE-BAO, anticoagulation was introduced (low-molecular heparin and dabigatran after 7 days for 3 months).

Results: patient had complete recovery.

Conclusions: As to our knowledge, this is the first case of RE-BAO treated with combination of bridging intravenous and rescue intra-arterial TPA and MT. Such approach recently showed promising results in anterior circulation (CHOICE trial) and our case support the effectiveness of this treatment also in posterior circulation.

Disclosure of interest: No

CASE REPORTS

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Calcified cerebral emboli as an unusual stroke mechanism with a hard challenging treatment: our 5-case series and review of the literature

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Background and aims: Calcified cerebral emboli (CCE) is a rare (but probably underdiagnosed) cause of acute ischemic stroke, mostly affecting the anterior circulation. It can be spontaneous or iatrogenic, but many times the cause remains undefined. Because of the embolus composition, treatment is associated with poor functional outcomes.

We present a 5-case series and review the available literature on this subject.

Methods: In the second half of 2022 we gathered 5 CCE cases at our hospital. We retrospectively collected personal history, NIHSS score at admission and at discharge, CCE location, etiology, treatment and functional outcome at 3 months measured with the modified Rankin Scale (mRS).

Results: Of our 5 patients, 3 were women and 2 men. They all had a baseline mRS of 0-1. The emboli were located at the middle cerebral artery (MCA) territory in all cases but one in posterior circulation. The etiology was spontaneous atherothrombotic in everyone except one related to a medical procedure. They all received intravenous fibrinolysis, and mechanical thrombectomy (MT) was performed in 2 patients. The 2 patients treated with MT maintained excellent functional outcome (3-month mRS 0-1). Recurrence was observed in 2 cases in the 3 months following the event (none of them received prior endovascular treatment).

Conclusions: CCE is not as uncommon ischemic stroke etiology as is thought, and it can be diagnosed with an initial CT of the brain. Early detection is important because of its treatment implications, although there is scarce literature available related to a standardized treatment.

Disclosure of interest: No

CASE REPORTS

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Cerebral small vessel disease linked to heterozygous pathogenic variant in HTRA1 gene - a case report

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Background and aims: Heterozygous pathogenic variants in *HTRA1* gene cause autosomal dominant arteriopathy with leukoencephalopathy and lacunar infarcts, a rare monogenic cerebral small vessel disease (SVD). It is characterized by clinical strokes, cognitive impairment, psychiatric features and headache. The clinical picture resembles CADASIL, but the onset is later than in CADASIL, caused by *Notch3* pathogenic variants. Most common MRI findings are white matter hyperintensities, subcortical lacunar infarcts, microbleeds and enlarged perivascular spaces.

Methods: We report a 53-year-old Finnish female patient with cerebral small vessel disease carrying heterozygous pathogenic variant in *HTRA1*.

Results: The patient has hypercholesterolemia and slightly elevated blood pressure as vascular risk factors. She suffered from migraine-like headaches without aura for seven years before diagnosis. She had no episodes of stroke, but MRI revealed moderate subcortical T2 white matter hyperintensities, lacunar infarcts periventricularly and bilaterally in thalamus and pons as well as dilated perivascular spaces. She also has developed memory disturbances, depression and cognitive decline. Her mother has had multiple clinical strokes, depression, epilepsy, balance disturbance, headache and bilateral subcortical infarcts and white matter hyperintensities in MRI in her sixties.

Gene panel testing, including *HTRA1* and *NOTCH3* genes was performed, and it revealed a previously reported heterozygous pathogenic variant c.958G>A, p.(Asp320Asn) in *HTRA1* gene.

Conclusions: For patients presenting with familial small vessel disease, negative for *Notch3* gene testing, the *HTRA1* gene testing should be considered. *HTRA1* is unrecognized cause of autosomal dominant SVD.

Disclosure of interest: No

CASE REPORTS

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POTENTIAL ROLE OF SEQUENTIAL VESSEL WALL MAGNETIC RESONANCE IMAGING IN MONITORING RESPONSE TO ANTITHROMBOTIC THERAPY IN STROKE DUE TO INTRACRANIAL ATHEROSCLEROTIC DISEASE: A CASE REPORT

Beatrice Del Bello*[1,2], Federico Mazzacane[1,2], Elisa Rognone[3], Federica Ferrari[1,2], Alessandra Persico[2], Maria Giovanna Cuzzoni[2], Anna Pichiecchio[1,3], Anna Cavallini[2]

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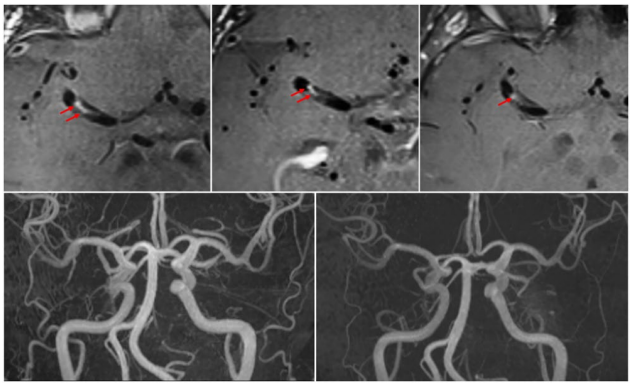
Background and aims: Current guidelines on secondary prevention of stroke due to intracranial atherosclerotic disease (ICAD) suggest dual antiplatelet therapy (DAPT) for 90 days, but the optimal duration is still unclear. Vessel wall MRI (VWMRI) details the characteristics of

intracranial atherosclerotic plaques. Contrast enhancement is a strong marker of plaque instability and stroke recurrence, but its utility in follow-up and therapeutic decision-making is unclear.
Methods: A 65-year-old man with history of smoking and acute myocardial infarction was admitted to our stroke unit for left hemiparesis and hypoesthesia. MRI demonstrated acute ischemic lesions in the right middle cerebral artery (MCA) territory; MRI angiography showed an irregular profile of the M1 tract, without significant stenosis. Prolonged ECG monitoring, CT angiography of epiaortic vessels, and transoesophageal echocardiography were unremarkable. VWMRI was performed and revealed a complicated atherosclerotic plaque characterized by vivid contrast enhancement at the M1 segment of right MCA. He was discharged with aspirin, clopidogrel, and high dose atorvastatin. A 3-month VWMRI follow-up was scheduled.
Results: At three months, VWMRI showed a reduced but persistent plaque enhancement, therefore we decided to prolong DAPT. At one year, VWMRI was repeated and there was only a punctiform enhancement of the plaque (Figure1). Single antiplatelet therapy was started. No stroke recurrence or hemorrhagic events occurred during follow-up.
Conclusions: Vessel wall MRI can assess the characteristics of the culprit atherosclerotic plaque in ICAD and monitor its evolution and response to therapy. Our case suggests that VWMRI may help to define a tailored approach to secondary prevention.



Disclosure of interest: No

CASE REPORTS

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ISCHAEMIC STROKE SECONDARY TO GIANT CELL ARTHERITIS: 4 Case Reports

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Background and aims: In view of stroke aetiology, the prevalence of large vessel vasculitis as the causative agent for a cerebral ischaemic event is a rare phenomenon. We present 4 cases of ischaemic stroke secondary to Giant Cell Arteritis (GCA).
Methods: Case report
Results: At the time of presentation to the stroke/ TIA services, all 4 patients fulfilled the EULAR 2018 guidelines for active GCA. The patients were previously independent at baseline; admission NIHSS ranged from 2-23.
All 4 patients displayed archetypical features of GCA pre-ischaemic event. ESR was elevated at admission in all cases (range 23-53 mm/hr). Angiographic images confirmed vertebrobasilar vessel involvement in all 4 cases; PET-FDG imaging further corroborated vertebral artery involvement in 2 of the 4 cases. Histological evidence via a temporal artery biopsy was utlised in 1 case.
All patients were started on corticosteroid therapy alongside antiplatelet therapy for initial treatment. N =2 required administration of DMARDs including methotrexate; N=1 required tocilizumab for refractory GCA treatment. Functional outcomes were variant amongst patients: N = 2 were deemed functionally at baseline, N=1 underwent a PEG insertion and transferred to the neurorehabilitation centres for mobility rehab, N=1 underwent a PEG insertion and required 24 hour care needs.
Conclusions: Literature highlights that cerebral ischaemic events are the leading cause of a mortality within patients with GCA. Whilst rare as an aetiological cause for stroke, it should not be under appreciated. Clinical suspicion alongside diagnostics and radiographic imaging should be used for effective diagnosis and administration of appropriate treatment.
Disclosure of interest: No

CASE REPORTS

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Endovascular Treatment of a Basilar Apex Aneurysm in a Patient with Bilateral Internal Carotid Artery (ICA) Occlusion: A Case Report

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Background and aims: Bilateral ICA occlusion may activate a collateral system via vertebro-basilar arteries. Multiple aneurysm formation in collateral vessels can result in the setting of hemodynamic stress. We present a patient with multiple V-B aneurysms and a bilateral ICA occlusion who underwent endovascular treatment of an unruptured basilar apex aneurysm. Significant recanalization occurred in a relatively short period of time after the first endovascular procedure, thus another procedure was needed.
Methods: The data was obtained by reviewing the patient's past medical records and performing additional diagnostic tests (digital subtraction angiography, carotid duplex sonography, transcranial color Doppler sonography, brain perfusion scanning) and therapeutic procedures (additional endovascular treatment). The discussion is based on available literature.
Results: We present a patient with multiple posterior circulation aneurysms and a bilateral ICA occlusion, in which endovascular treatment of a basilar tip aneurysm proved to be a short-term success due to continued hemodynamic stress and a subsequent recanalization.
Conclusions: The continued hemodynamic stress on posterior circulation in the setting of a bilateral ICA occlusion may accelerate the recanalization of previously treated aneurysms and a de novo aneurysm formation in these vessels. ICA bypass surgery would result in a reduced hemodynamic load and might present a long-term solution for these patients.
Disclosure of interest: No

CASE REPORTS

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ACUTE ENCEPHALOPATHY. AN UNUSUAL PRESENTATION OF CADASIL DISEASE

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López Mesonero[1], José Miguel Velázquez Pérez[1], José Carlos Morán Sánchez[1], Laura Redondo[1]
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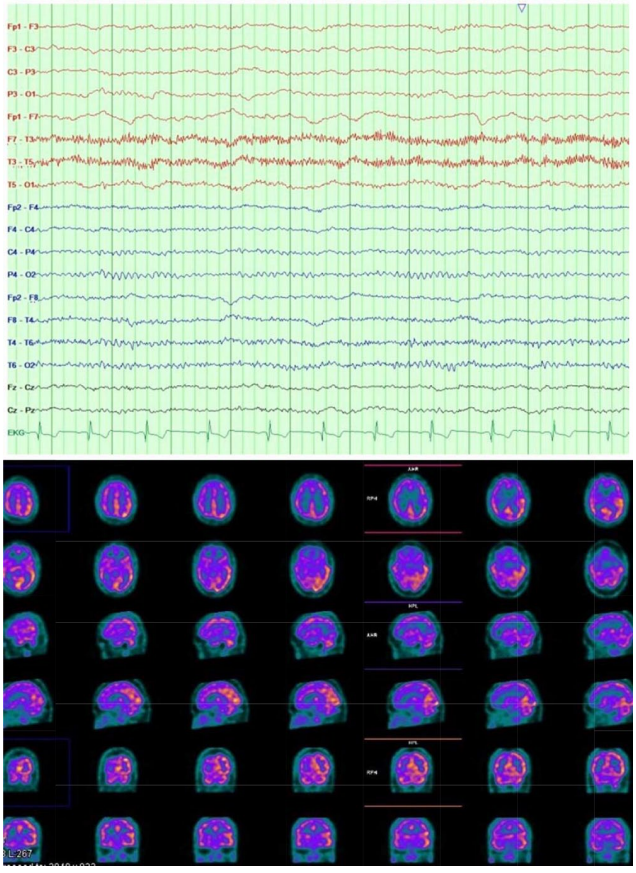
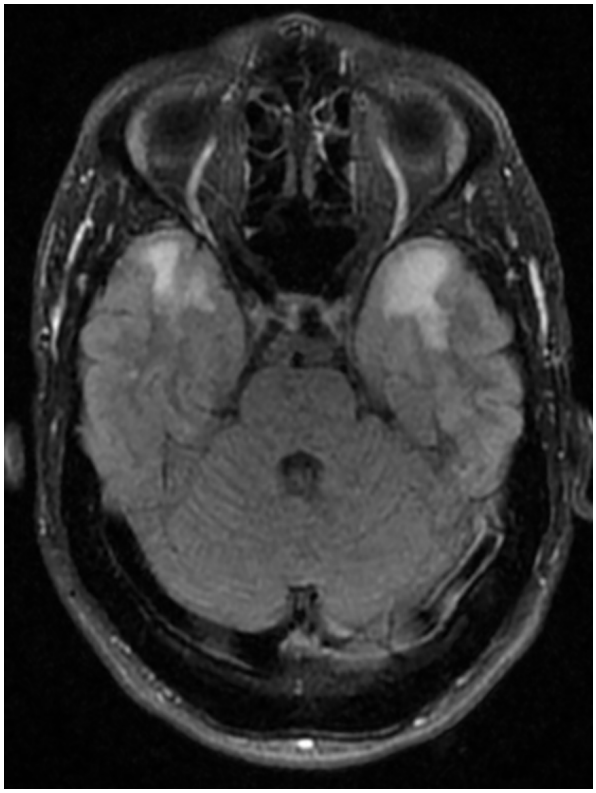
Background and aims: Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL) is a genetic disease that may present as lacunar stroke, acute reversible encephalopathy (10%), migraine with aura, dementia, psychiatric disorders, or seizures.
We report an unusual presentation of CADASIL to enhance clinical suspicion and remark its relevance.
Methods: 36-year-old man with CADASIL disease family history who developed headache, fever, drowsiness, vomiting and a left hemispheric syndrome (aphasia, right homonymous hemianopsia, right sensory extinction and deafferentation of the right arm). Initially, differential diagnosis included: meningoencephalitis, stroke, migraine with aura or seizures.
Results: An urgent brain MRI showed diffuse periventricular hyperintensities in T2-weight sequences without restriction in diffusion-weighted imaging sequence, predominantly especially in the anterior temporal lobes and internal capsules. Cerebrospinal fluid analysis was normal. Electroencephalogram (EEG) showed left hemisphere slow wave activity. Infectious agents were ruled out.
Due to inconclusive results, not only supplementary tests were repeated, but new functional and genetic studies were performed. Brain MRI did not reveal any other finding, but EEG confirmed a moderate improvement of the slow wave activity. Brain perfusion SPECT showed hypoperfusion in frontal cortex, right occipital lobe and left parietal and temporal lobes. Finally, the detection of NOTCH-3 mutation confirmed the diagnosis.
After ten days of hospitalization the patient was discharged, and acetylsalicylic acid was started as secondary stroke prevention treatment.
Conclusions: The acute reversible encephalopathy is an underdiagnose presentation of CADASIL that should be considered. There are needed more investigations to know its prevalence in every country.





Disclosure of interest: No

CASE REPORTS

1979

Title: Prevalence of stroke and intracranial involvement in mucormycosis patients with COVID-19 infection in India

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Background and aims: During the rampantly spreading of COVID-19, India observed a surge in mucormycosis cases, a type of fungal infection. The infection mainly spread through the nasal passage and in few uncontrolled cases, it crossed the dura mater and presented itself as rhino-orbital-cerebral mucormycosis (ROCM).
Methods: The cases of ROCM in COVID-19 patients described in this series are included from a case-control study conducted by us. Patients were included from April 10, 2021 onwards. Follow-up was conducted after about 90 days and health-status were recorded on basis of modified-Rankin-Scale (mRS).
Results: Mean age of presentation was 47.54 years (age range 26 to 71 years). Patients with COVID-19 associated mucormycosis were divided into different COVID-19 grades: mild 64.28% (18/28), moderate 32.14% (9/28), and severe 7.14% (2/28). Out of all the COVID-19 associated mucormycosis patients included, 43.05% (31/72) patients showed

intracranial involvement. Intracranial involvement was seen in the form of haemorrhage in 11.53% (3/26), abscess formation in 26.92% (7/26) patients, three patients displayed meninges involvement and 44% (11/25) patients had thrombosis. Mortality rate observed ROCM cases was 40% (10/25). Among patients that survived 56% (14/25) are asymptomatic, one patient is surviving with disabilities.

Conclusions: Our case-series showed intracranial extension of mucormycosis in COVID-19 patients in the form of predominant thrombosis followed by intracranial abscess and haemorrhage. Appropriate care, antifungal medication and surgical procedures should be performed in conjunction to manage the spread of disease.

Disclosure of interest: No

CASE REPORTS

1994

CASE STUDY: DYSPHAGIA PRESENTATION AND RECOVERY IN A PATIENT WITH A LATERAL MEDULLARY INFARCT

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Background and aims: Lateral medullary infarctions cause profound and long-lasting dysphagia. Surprisingly few studies have investigated prognosis for swallowing recovery in this group, impacting potential for evidence-based management. This study presents the dysphagia course and therapy provided for patient 'X' with a right lateral medullary infarct.

Methods: Speech and Language Therapy (SLT) session frequency and duration was recorded and progress charted with the Functional Oral Intake Scale (FOIS)[1] at baseline and at weekly intervals during X's admission. Instrumental assessments and intensive swallow therapy were conducted according to clinical presentation.

Results: X was known to SLT for 43 working days and seen for therapy on 30 of those days (70%). Two instrumental evaluations were completed: a fibreoptic endoscopic evaluation of swallowing (FEES) at three weeks and a videofluoroscopy at seven weeks. On initial assessment, no swallow was triggered indicating profound dysphagia. Therapy included chin tuck against resistance[2] and oral trials including sensory stimulation. 880 minutes of therapy were completed for an average of 29.3 minutes/session. FOIS scores and event timeline are shown in Figure 1 with dysphagia resolution at nine weeks.

Conclusions: This case study adds to the small body of evidence demonstrating the dysphagia course in lateral medullary infarcts. Despite profound impairment, in the context of intensive inpatient dysphagia therapy and access to instrumental assessments, X returned to their baseline of regular diet and thin fluids within nine weeks.

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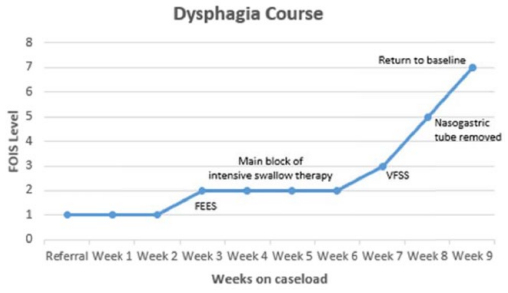

Figure 1. Dysphagia course timeline.

Disclosure of interest: No

CASE REPORTS

1999

DELAYED PERIHEMATOMAL EDEMA IN THREE PATIENTS WITH SPONTANEOUS INTRACRANIAL HAEMORRHAGE

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Background and aims: To describe three interesting cases of delayed Perihematomal edema (PHE) in patients with spontaneous intracerebral haemorrhage (sICH) a rare complication of sICH. Published literature shows that delayed PHE can occur up to 4 weeks after sICH. No evidence of delayed PHE after 6weeks of onset of sICH as described in one of the cases was found.

Methods: Three patients of sICH with delayed PHE were observed ambispectively. These patients underwent clinical examination and routine blood investigations, workup for young ICH and HTN. NCCT brain was done for all the patients and DSA for ruling out vascular malformations was done for two patients. Case 3 was unstable for a DSA.

Results: Delayed PHE occurred at a maximum of 43 days (range, 20-43days). Two patients improved with medical management and had mRS at 3 months (case 1 and 2) of 2 while case 3 required surgery and had mRS-5 at 3months.

Conclusions: PHE should be suspected in young patients following onset of sICH and can be treated with good outcome. Larger studies are required to identify predictors of delayed PHE for patients who require prolonged follow-up.

Disclosure of interest: No

CASE REPORTS

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STROKE MIMIC: SPINAL EPIDURAL ABSCESS WITH SYMPTOMATIC LEFT CAROTID STENOSIS WITH INITIAL PRESENTATION OF DECREASED PERFUSION IN LEFT HEMISPHERE SECONDARY TO HYPOTENSION AFTER A FALL

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Background and aims: Spinal shock due to high impact, direct trauma, or ischemia of the spinal cord can cause severe hypotension along with absence of reflexes below the level of the lesion. In a patient with severe carotid stenosis, the hypotension resulting from spinal shock can cause decreased cerebral perfusion and symptoms mimicking a stroke. Eventually, sustained hypotension can also cause strokes.

Methods: We report the case of a 64-year-old female with unremarkable PMH who presented initially after a fall resulting in severe hypotension and initial paralysis of hands/legs with complete anesthesia below the neck. The patient then developed left gaze preference and right sided weakness. Initial imaging indicated increased time to peak in the left hemisphere with decreased cerebral blood volume in same region, left fetal posterior cerebral artery (PCA), 60-65% stenosis of proximal left internal carotid artery (ICA) and hyperdensity in the neck concerning for epidural fluid collection.

Results: An emergent MRI of the brain indicated only minor diffusion restriction in the left cerebral cortex with relative sparing of the hemisphere. As hypotension was corrected, patient's symptoms improved. Spinal MRI indicated epidural abscess extending from craniocervical junction to thoracic and lumbar canals. After C2-7 laminectomy for epidural abscess/hematoma, patient also was taken for left carotid stent placement.
Conclusions: Spinal shock can mimic a stroke due to severe hypotension in the setting of otherwise asymptomatic carotid stenosis. During initial stroke evaluation, it is prudent for neurologists to look at the cervical spine to ensure no hyperdensity is present.
Disclosure of interest: No

ESOC 2023 – E-Poster

ACUTE MANAGEMENT – NEITHER THROMBOLYSIS NOR THROMBECTOMY

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Clinical judgment to detect large vessel occlusion underlying suspected stroke - a prospective single-centre diagnostic accuracy trial

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Background and aims: Scores are available to detect LVO in a pre-hospital setting, but it is unknown whether the experience of stroke neurologists improves pre-imaging assessment of LVO likelihood. We tested the hypothesis that clinical judgment is non-inferior to RACE and FAST-ED in detecting LVO in suspected acute stroke.
Methods: CLUE-LVO was a prospective diagnostic accuracy trial conducted March—December 2022. Patients with the suspicion of acute stroke were eligible for inclusion if they received cerebral vessel imaging. Treating stroke physicians were asked to assess, before imaging, the likelihood of acute LVO. RACE and FAST-ED were reconstructed from NIHSS scores. Diagnostic accuracies were quantified using AUC and compared using a multi-reader multi-case design. A non-inferiority margin of -0.05 was prespecified and simulation-based power analysis indicated a sample size of 50 LVO cases.
Results: 178 patients (74y, 52% women) were included. Median NIHSS score was 6 (IQR 3—13). LVO was present in 46 (26%). AUC for detecting LVO by clinical judgment was 0.97 (95%-CI: 0.93—1); by RACE 0.82 (0.71—0.92); and by FAST-ED 0.78 (0.65—0.91). Clinical judgment was non-inferior, and in fact superior, to RACE (ΔAUC 0.15, 0.06—0.24, $P < 0.001$) and FAST-ED (ΔAUC 0.19, 0.10—0.27, $P < 0.001$). Results were confirmed in patients with ischemic stroke or TIA.
Conclusions: Results indicate that detection of LVO can be improved by clinical judgment. Further research is needed to investigate how neurological experience can be applied in a pre-hospital setting and inform patient management.
Disclosure of interest: No

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Significance of D-dimer Levels during Acute Period in Patients with Ischemic Stroke

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Background and aims: Initial D-dimer level is a well-known prognostic parameter in patients with acute ischemic stroke (AIS). However, there have been no studies on the clinical significance of follow-up D-dimer levels. In this study, we evaluated the association between initial and follow-up D-dimer levels and early neurological deterioration (END) in patients with AIS.
Methods: We included consecutive patients with AIS whose initial and follow-up D-dimer levels were measured between March 2021 and November 2022. The follow-up D-dimer test was performed on the 7th day after hospitalization and the day of discharge if discharged earlier. END was defined as an increase of $\geqslant 2$ in the total NIHSS score, or $\geqslant 1$ in the motor NIHSS score within the first 7 days of admission.
Results: A total of 246 patients with AIS were evaluated. In multivariable logistic regression analysis, the initial D-dimer level was closely associated with END after adjusting for confounders. The follow-up D-dimer level also showed a close correlation with END. Analysis of the quantitative relationship with neurological outcomes and complications showed that the initial D-dimer levels had a statistically significant relationship only with END and active cancer. Conversely, the follow-up D-dimer level showed a clear positive quantitative relationship with END, active cancer, and venous thromboembolism.
Conclusions: Initial and follow-up D-dimer levels were associated with END in AIS patients. Particularly, the follow-up D-dimer level showed a clear correlation not only with END but also with the underlying cancer or the occurrence of venous thromboembolism during the acute period.
Disclosure of interest: No

1631

Insights from the Retina on Cerebral Microvascular Dysfunction in Aneurysmal Subarachnoid Hemorrhage

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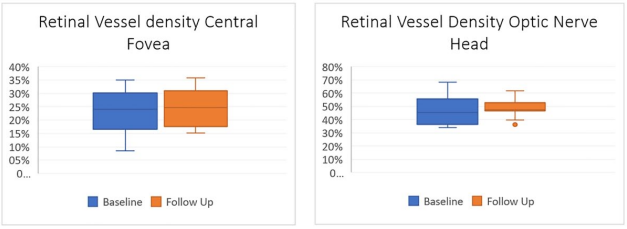
Background and aims: Microvascular changes are pathophysiologically linked to primary and secondary brain damage (e.g. delayed cerebrals ischemia (DCI)) after aneurysmal subarachnoid hemorrhage (aSAH). Changes in retinal Vessel Density (rVD) measured with optical coherence tomography angiography (OCTA) may serve as a biomarker for microcirculatory constriction. The aim of the study was to evaluate the feasibility of OCTA examinations on a neurocritical care unit (NCCU) and to detect, quantify and correlate retinal microvascular changes with cerebral microcirculatory dysfunction after aSAH.
Methods: Patients with aSAH were examined on the NCCU (mean day 8, SD 4 days) and after 3-6 months using the Spectralis Flex (Heidelberg Engineering, Germany). On OCTA, rVD was measured in the central fovea and at the optic nerve head.
Results: We prospectively enrolled 11 patients, 9 had vasospasm, 1 with DCI. 8 patients completed the 3-6 months follow-up. In total 18 measurements were performed. The quality of images was sufficient for analysis in 83% of examinations. No safety concern aroused. There were no significant differences in retinal vessel density between the first examination and on follow-up in the central fovea (mean 23%, SD 8% vs. 24%, SD 6%; p=0.375) and the optic nerve head (mean 47%, SD 11% vs. 49% SD 7%; p=0.50).
Conclusions: OCTA examinations with the Spectralis Flex in patients with aSAH is safe and feasible in the environment of an NCCU. More data are needed to estimate whether rVD may serve as a clinical surrogate parameter to detect microcirculatory constriction early after aneurysm rupture.



Disclosure of interest: No

1973

Clinical features of stroke in young adults

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Background and aims: In fact, 10-15% of strokes occur in people aged 18 to 50. The aim of this study was to investigate clinical features of stroke in young people.
Methods: Patients aged 18-44 years with acute stroke admitted in our hospital between 2020-2022, 110 women and 111 men were examined.
Results: The average age of patients was 35±5.1, for men 36±4.4, for women 34±5.1. 66 (29.86%) of patients were in the younger age group (18-30 years), and 155 (70.14%) in older age group (31-45 years). In 151 (68,4%) patients stroke was noted as a primary, in 70 (31,6%) recurrent. 129 (53.63%) patients had ischemic stroke (IS), 63 (28.07%) patients had intraparenchymal hemorrhage (ICH), 16 (7.2%) subarachnoid hemorrhage (SAH), and 13 (11.1%) venous sinus thrombosis (VST).
The distribution of stroke by sex showed that the percentage of patients with ischemic, hemorrhagic and subarachnoid stroke did not differ. The exception was VST, where percentage of women predominated (13% women and 0% men).
It was found that in the older age group IS (42,08%) and SAH (7,24%) occur more often than younger group.
Conclusions: In the older age group, ischemic stroke and SAH are more common. VST is more common in women.
Disclosure of interest: No

2017

Inter-rater reliability between paramedics and neurologist in the assessment of severe hemiparesis in acute stroke: comparation between the years 2016 and 2021

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Background and aims: Pre-hospital triage by paramedics could determine which patients qualify for direct transport to comprehensive stroke centers for mechanical thrombectomy. For triage, paramedics have to be able to identify severe hemiparesis, which is part of the FAST PLUS test. The first goal of our study was to determine inter-rater reliability between paramedics and stroke neurologists in identifying severe hemiparesis. The second goal of our study was to compare the findings of the 2016 and 2021 studies to assess the change in the inter-rater reliability.
Methods: In this retrospective-monocentric study, inter-rater agreement between paramedics and stroke specialists in evaluating the degree of hemiparesis (National Institutes of Health Stroke Scale [NIHSS]) was assessed using the unweighted κ index.
Results: In the year 2016 paramedics carried out 435 tests on 899 patients (48%), in the year 2021 it was 296 tests on 448 patients (66%). The total agreement in the year 2016 was: κ 0.43 (95% CI 0.36–0.50). In 2021 κ was 0.41 (95% CI 0.31–0.52).
Conclusions: We found moderate reproducibility of the identification of severe hemiparesis in acute stroke patients assessed by paramedics. Possible explanation of no difference in inter-rater reliability might be disruption in education activities for paramedics due to the COVID-19 pandemic. The imperative is to educate the paramedic in evaluating acute deficit in pre-hospital setting.
Disclosure of interest: No

2085

UNEXPECTED STROKE IN POSTERIOR CIRCULATION - OUR EXPERIENCE

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Background and aims: Ischemic stroke in posterior circulation can be sometimes difficult to diagnose due to non specific symptoms and limitations of imaging modalities. We present a subgroup of unexpected strokes in posterior circulation.
Methods: Retrospective study of ischemic strokes in our stroke center during years 2019 - 2021, group of posterior circulation stroke was examined. We focused on subgroup of unexpected infratentorial posterior circulation stroke (NIHSS 0) with non specific symptoms. Stroke was confirmed with MRI difussion weighted and T2 images. MRI T2 manual volumetry of ischemic lesions was measured with navigation software. Modified Rankin scale after 3 months was assessed.
Results: Among 1428 ischemic strokes in years 2019 - 2021 in our stroke center (513, 522, 393 respectively), 135 ischemic strokes were diagnosed in posterior circulation (42, 41, 51 respectively, 9,5 % of all ischemic strokes). 17 cases of stroke in posterior circulation was unexpected (8, 6, 3 respectively, 12,6 % of posterior strokes) with initial NIHSS 0 and nonspecific symptoms such dizziness, nausea, vomiting, unilateral nystagmus, arterial hypertension and gait disturbances. In 9 cases there was ischemia larger then 30cc (cubic centimeters) and in 2 cases was later altered consciousness with need of decompressive craniectomy. Modified Rankin scale of 15 cases was good (mRS 0-2), in two cases we don't know the outcome (in one case with decompressive craniectomy, the last known mRS 5).
Conclusions: Despite the number of large volume of unexpected ischemic strokes in posterior fossa the overall outcome was mostly was good.
Disclosure of interest: No

2175

Surgical treatment for anterior spinal artery aneurysm and AVM

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Background and aims: Vascular lesions arising from anterior spinal arteries are very rare. Rupture of an anterior spinal artery aneurysm or AVM is a rare cause of subarachnoid hemorrhage accounting for less than 1% of all cases reported in the literature. The management options include a surgical approach, endovascular embolization, or conservative treatment. Endovascular treatment with embolization using coils or liquid embolic agents is very difficult to reach to the aneurysm and to preserve parent artery and very dangerous risk of medullar infarction result in quadriparesis. So the surgical approach is usually employed in origin of anterior spinal artery and AVM. Far lateral approach is useful method to approach to the origin of anterior spinal artery and manage the aneurysm and AVM.
Methods: We experienced 3 cases of ruptured anterior spinal artery aneurysms and 2 case of ruptured AVM.
Results: All patients presented SAH Fisher grde 2. And clinically H-H grade 2 and 3. And successfully treated surgical managements, one clipping, two wrapping of aneur ysms, 2 removal of AVMs, via far lateral approach. No patients presented newly developed postoperative neurologic deficit.
Conclusions: Far lateral approach is useful method to approach to the origin of anterior spinal artery and manage the aneurysm and AVM. We successfully surgically treated ruptured anrusysms,and AVM arising from anterior spinal artery with far lateral approach
Disclosure of interest: No

ACUTE MANAGEMENT – THROMBOLYSIS OR THROMBECTOMY

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GLENZOCIMAB PROMOTES OPTIMAL REPERFUSION AND RECOVERY WITH SAFETY IN ELDERLY STROKE POPULATION

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Background and aims: With ageing of population, collecting data about safety of novel reperfusion therapies in elderly stroke patients is crucial. Glenzocimab is a new humanized antibody fragment targeting platelet glycoprotein VI involved in inflammatory thrombosis in acute ischemic stroke (AIS). We aim to assess safety and efficacy of 1000 mg single dose of glenzocimab in the subgroup of elderly patients included in the ACTIMIS study.
Methods: ACTIMIS (NCT03803007) was a phase 2a study including AIS patients randomly assigned 1:1 to glenzocimab or placebo. In the subgroup of elderly patients (⩾ 80 years), main safety endpoints with symptomatic intracranial hemorrhages (s-ICH) and death, and main efficacy endpoints with successful reperfusion (TICI 2b-3) and early recovery (difference between baseline and 24-hour NIHSS score) were assessed.
Results: Among 106 patients recruited in ACTIMIS study, 43 (40.6%) were of advanced age as defined. For safety results, no elderly patient presented s-ICH in glenzocimab arm. In the overall placebo population, 5 patients presented s-ICH included only one elderly patient (92 years). In overall population, 15 patients died including 7 (47%) elderly patients (5 with placebo, and 2 with glenzocimab) for whom 3 deaths were stroke-related. Elderly patients with mechanical thrombectomy (MT) and treated with glenzocimab achieved higher optimal reperfusion rate (50% vs. 13% with placebo).
Conclusions: These preliminary findings suggest glenzocimab achieves an enhanced early neurological recovery in all elderly patients and a higher successful reperfusion rate in those treated by MT.

	Glenzocimab 1000 mg	Placebo
N - n (%)	20 (47)	23 (54)
Gender		
Female	13 (65)	13 (57)
Male	7 (35)	10 (44)
Age		
Mean	84.5	86.0
Median	83.0	85.0
Min-Max	80-95	80-93
NIHSS score ± SD		
Baseline	15.1 ± 4.5	13.3 ± 5.7
24 hrs	10.5 ± 6.1	10.7 ± 8.8
Δ T0-T24hrs	-4.7 ± 5.3	-2.6 ± 7.4

Patients treated by MT	Glenzocimab 1000 mg	Placebo
N	12	8
NIHSS score at 24 hrs - n (%)		
Improvement from baseline		
At least 4 points	7 (58)	2 (25)
At least 8 points	5 (42)	1 (13)
Worsening from baseline		
At least 4 points	0	3 (38)
At least 8 points	0	2 (25)
Post-MT Recanalization - n (%)		
mTICI score		
Successful Recanalization (grade 2b-3)	12 (100)	4 (50)
Complete Recanalization (grade 3)	6 (50)	1 (13)

Disclosure of interest: Yes

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ACUTE BASILAR ARTERY OCCLUSION: DIFFERENCES IN CHARACTERISTICS AND OUTCOMES AFTER RECANALIZATION THERAPY BETWEEN PATIENTS WITH AND WITHOUT INTRACRANIAL ATHEROSCLEROSIS DISEASE IN PEOPLE 115 HOSPITAL

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Background and aims: Intracranial atherosclerotic disease (ICAD) and embolism have been identified as major causes of acute basilar artery occlusion (BAO). This study compared the characteristics and treatment outcomes in patients with acute BAO with and without ICAD.
Methods: Data from a registry study of patients with acute ischemic stroke due to BAO was performed at People's Hospital 115, Ho Chi Minh City, Vietnam. From September 2021 to September 2022, we identified 122 patients with acute BAO underwent recanalization therapy (endovascular alone, endovascular combined ateplase or ateplase alone). The characteristics and outcomes were analyzed and compared between patients ICAD and non ICAD.
Results: Among the 122 patients enrolled, 91 (71.4%) patients were categorized in the ICAD group, and 31 (28.6%) in the non ICAD group. Occlusion in the proximal segment of the basilar artery was more common in patients with ICAD (18.7% vs 3.2%, $p < .001$), whereas distal segment was the most common location in non ICAD patients (64.5% vs 15.4%, $p < .001$). The rate of atrial fibrillation in non ICAD group was higher than the other (71% vs 0%, $p < 0.000001$). There were no significant differences in the rates of successful revascularization, symptomatic hemorrhage, and mortality between 2 groups.
Conclusions: ICAD was more common etiology in patients with BAO in Vietnam. The occlusion sites and a history of atrial fibrillation might be related to ICAD in patients with BAO. Prediction of underlying etiology before treatment might be helpful for appropriate therapeutic planning in patients with BAO.
Disclosure of interest: No

1445

Influence of heart disease on Outcome for Thrombolysis-Treated Acute Ischemic Stroke: a post hoc analysis of ENCHANTED trial

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Background and aims: The influence of heart disease on recovery from acute ischaemic stroke (AIS) has not been quantified. We aimed to assess the association between history of heart diseases and functional outcomes in acute ischemic stroke in the Enhanced Control of Hypertension and Thrombolysis Stroke Study (ENCHANTED).
Methods: Post-hoc analyses of blood pressure control arm of the ENCHANTED trial, an international quasi-factorial randomised evaluation of intravenous alteplase-dose comparison and levels of blood pressure control in patients who had thrombolysed AIS. Baseline history of heart disease included coronary heart disease, atrial fibrillation, heart disease and other heart disease (e.g. heart failure). The association of DM on death or disability (modified Rankin scale [mRS] scores 2-6), death or major disability (mRS score 3-6), death (mRS score 6), symptomatic intracerebral hemorrhage at 90-days were assessed in logistic regression models.
Results: In 2179 AIS patients (mean age 66.9 years, female 38.0%), 525 (24.09%) existed at least one heart disease. The history of at least one heart disease was associated with mortality (adjusted odds ratio [aOR] 1.66, 95% CI 1.18-2.35), but not associated with disability and mortality (aOR 1.06, 95% CI 0.84-1.33) or major disability and mortality (aOR 1.18, 95% CI 0.93-1.50). History of at least one heart disease increased the risk of symptomatic intracerebral haemorrhage.
Conclusions: A history of at least one heart disease was an independent predictor of mortality and sICH in thrombolysis-treated AIS patients.
Disclosure of interest: No

1486

Effect of sex and age on outcome in Medium Vessel Occlusion stroke patients after Endovascular Treatment

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Background and aims: Endovascular treatment (EVT) has proven to be a safe and effective method to treat large vessel occlusion strokes. However, less is known regarding EVT treatment in patients with medium vessel occlusion stroke (MeVO). There is increasing awareness of sex differences in stroke such as presenting symptoms and outcomes. This study aims to determine how sex and age affect the outcome in EVT treated primary MeVO patients.
Methods: 956 stroke patients accepted for EVT were enrolled in the Oslo Stroke Reperfusion Study (OSCAR) between January 2017 and December 2021. Of these, 144 patients with primary MeVO in middle cerebral artery territory were selected. Clinical and radiological data were collected. Thrombolysis in cerebral infarction (TICI) scale were scored by two independent neuroradiologists. Heidelberg Bleeding Classification were used to score hemorrhage. MRS score was obtained after 3 months.
Results: 77 men and 67 women were included in the study. Time to recanalization, TICI score and number of passes with stent-retriever were the main factors predicting outcome (mRS) after 3 months. Age over 80 years were significantly associated with bad outcome and death in both sex. Women had in average 68 min longer ictus to recanalization time compared to men. Despite the delay in treatment, there were no significant differences in TICI score, hemorrhage or clinical outcome between men and women.

Conclusions: Women with MeVO strokes had significant longer time from ictus to recanalization, however, this did not affect the clinical outcome in women in the present study.
Disclosure of interest: No

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WORKFLOW TIMES AND OUTCOMES BY SEX IN ACUTE ISCHEMIC STROKE PATIENTS TREATED WITH ALTEPLASE VERSUS TENECTEPLASE: A SUBGROUP ANALYSIS OF THE ACT TRIAL

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Background and aims: Understanding sex differences in stroke care and outcomes is important for reducing potential disparities. We compared outcomes and workflow by sex in individuals receiving intravenous thrombolysis (IVT) in the Alteplase compared to Tenecteplase (AcT) trial, a Canadian multicentre, randomised non-inferiority trial in acute ischemic stroke.
Methods: In this post-hoc analysis, we compared acute stroke workflow and outcomes by sex using mixed-effects Poisson regression (covariate adjustment for age, stroke severity), and assessed for sex*treatment interactions. The primary outcome was excellent functional outcome (modified Rankin Score [mRS] 0-1) at 90 days. Secondary and safety outcomes included return to baseline function, successful reperfusion (eTICI⩾2b), death and symptomatic intracerebral hemorrhage.
Results: Of 1577 patients, 755 (47.9%) were women. Median age was 77 years (IQR 68-86). Baseline characteristics and workflow times were similar between sexes (Table). There were no differences in rates of mRS 0-1 (aRR 0.95 [0.86-1.06]), return to baseline function (aRR 0.94 [0.84-1.06]), reperfusion (aRR 0.98 [0.80-1.19]) and death (aRR 0.91 [0.79-1.18]). There was no effect modification by treatment type on the association between sex and outcomes. The probability of excellent functional outcome decreased with increasing onset-to-needle time. This relation did not vary by sex ($p_{interaction}$ 0.42).
Conclusions: The AcT trial demonstrated comparable functional, safety and angiographic outcomes by sex. This effect did not differ between alteplase and tenecteplase. The pragmatic enrolment criteria and broad national participation in AcT provide reassurance that sex disparities were not apparent in key quality indicators amongst people receiving IVT at Canadian centres.

Table: Baseline characteristics and workflow times between men and women who received intravenous thrombolysis

	Men (n=822)	Women (n=755)
Characteristic:		
Age in years – median (IQR)	70 (59-79)	77 (68-86)
Baseline NIHSS score – median (IQR)	9 (5-15)	10 (6-18)
Baseline NIHSS score (n=1569)		
<8	355/819 (43.35%)	264/750 (35.20%)
8-15	260/819 (31.75%)	243/750 (32.40%)
>15	204/819 (24.91%)	243/750 (32.40%)
Baseline ASPECTS score – median (IQR)	9 (8-10)	9 (8-10)
Intracranial occlusion site on baseline CT angiography (n=1558)		
ICA	63/813 (7.75%)	72/745 (9.66%)
M1 segment MCA	105/813 (12.92%)	132/745 (17.72%)
M2 segment MCA	149/813 (18.33%)	166/745 (22.28%)
Other distal occlusions (MCA, ACA, PCA)	146/813 (17.96%)	122/745 (16.38%)
Vertebrobasilar arterial system	46/813 (5.66%)	18/745 (2.42%)
Cervical ICA	16/813 (1.97%)	10/745 (1.34%)
No visible occlusions	288/813 (35.42%)	225/745 (30.20%)
Presence of large vessel occlusion on baseline CT angiography	175/813 (21.53%)	214/746 (28.69%)
Type of enrolling centre (n=1577)		
Primary stroke centre	57/822 (6.93%)	42/755 (5.56%)
Comprehensive stroke centre	765/822 (93.07%)	713/755 (94.44%)
Workflow times in minutes – median (IQR):		
Symptom onset to hospital arrival	80 (54-132)	84 (56-143)
Symptom onset to randomization	121 (86-177)	126 (94-184)
Symptom onset to needle (IVT start)	126 (94-184)	132 (95-189)
Stroke onset to puncture (in patients undergoing EVT)	161 (128-230)	154 (119-214)
Door (hospital arrival) to puncture (in patients undergoing EVT)	81 (60-106)	70 (55-101)
Baseline CT to puncture (in patients undergoing EVT)	62 (45-90)	55 (39-84)
Puncture to first reperfusion (in patients undergoing EVT)	36 (22-52)	32 (20-52)

NIHSS, National Institutes Health Stroke Scale; ASPECTS, Alberta Stroke Program Early CT Score; ICA, internal carotid artery; MCA, middle cerebral artery; ACA, anterior cerebral artery; PCA, posterior cerebral artery; EVT, endovascular thrombectomy; IVT, intravenous thrombolysis; IQR, interquartile range

Disclosure of interest: No

1838

Occlusion type and posterior communicating artery patency may predict favorable outcome after endovascular thrombectomy in selective basilar top occlusion

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Background and aims: The top of the basilar artery is a five-branched junction, two superior cerebellar arteries (SCAs), two posterior cerebellar arteries (PCAs), and the basilar artery itself. This study aimed to investigate prognostic factors in patients with selective acute basilar top occlusion managed with mechanical thrombectomy, focusing on occlusion type PCoA patency
Methods: Eligible patients underwent endovascular treatment (EVT) for acute basilar top occlusion were reviewed. Patterns of basilar top occlusion were categorized as types I-III according to whether the SCA and PCA were visible on angiography. The PCoA was categorized as hypoplastic or non-visible (type I), normal patency but non-visible PCA through PCoA flow (type II), and fetal type (type III).
Results: Good outcomes were observed in 50% and mortality in 11.9% of the cases at 90 days. Patients with good outcomes showed lower baseline National Institutes of Health Stroke Scale (NIHSS) score ($P = 0.001$) and a higher proportion of type III basilar top occlusion ($P = 0.004$) and type III PCoA ($P = 0.001$). Multivariable logistic analysis showed that baseline NIHSS score [odds ratio (OR), 0.84; 95% confidence interval (CI), 0.73-0.97; $P = 0.017$) and type III PCoA (OR, 21.54, 95% CI, 1.33-347.97; $P = 0.031$) were independent predictors of good functional outcomes
Conclusions: A low initial NIHSS score and good PCoA patency were independent predictors of favorable clinical outcomes after EVT in patients with acute basilar top occlusion. Furthermore, the favorable outcome group showed a high proportion of type III basilar top occlusions
Disclosure of interest: No

2071

Trans Radial Artery Embolectomy with 7Fr Balloon guiding catheter: Report of 19 Cases

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Background and aims: The purpose of this study was reporting the usefulness of Trans Radial artery mechanical Embolectomy using a 7Fr balloon guiding catheter (TREBL7).
Methods: Of 158 patients with treated with mechanical embolectomy for large vessel occlusion who were admitted to our department during a 3-year period from January 2020 to December 2022. 137 (87%) of 158 patients were large vessel occlusion of anterior circulation. 19(14%) of 137 patients underwent TREBL7. The background factors, time from puncture to placement of 7BGC in the internal carotid artery (P2G), time from puncture to effective recanalization with mTICI⩾2b (P2R) were retrospectively evaluated in these 19 patients.
Results: Ten patients (53%) were male and their median age (83(64-96) years. 17(89%) patients were right-sided anterior circulation occlusion. 2cases were ICA occlusion, 12 cases were M1 occlusion, and 5 cases were M2 occlusion. Pre-onset mRS (median) was 3 (0-4), NIHSS on admission (median): 15 (5-35), pre-treatment CT-ASPECTS (median) 10 (7-10), IVtPA in 9(47%) cases. All patients achieved effective recanalization: median time from onset to hospital visit 71.5 (33-1003) minutes, median time from hospital visit to puncture 83.5 (28-132) minutes, median P2G 11 (7-23) minutes, median P2R 42 (10-161) minutes, complete recanalization in 11 cases, mTICI: 2b in 8 cases. A 5Fr aspiration catheter was used in 18(95%) cases, and a stent retriever was used in 15(79%) cases.
Conclusions: In TREBL7, P2G within 20 minutes was achieved in 18(95%) cases, and recanalization of mTICI:2b or better was achieved in all cases.
Disclosure of interest: No

2206

Brain and body autopsy findings of acute ischemic stroke patients with and without iv. thrombolysis

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Background and aims: the brain and body autopsy of stroke patients may provide correct informations about the clinically silent diseases (eg, systemic tumour), the true incidence of hemorrhagic transformations, thromboembolic and pneumonia complications.
Methods: we analyzed the postmortem brain and body autopsy findings of 534 stroke patients (without iv. thrombolysis) and the brain and body autopsy findings of 98 stroke patients with iv. thrombolysis but passed away
Results: the brain autopsy of *non-lysis* patients revealed 35% smaller or larger hemorrhagic transformation (HT) and 47% in the group of *lysis* patients. Admission INR p:0.043 and lower platelet count p:0.011 increased the risk of a HT.
The body autopsy of *non-lysis* stroke patients detected 1.5% malignant systemic tumor and 28,6% thromboembolic events and pneumonia, not diagnosed in the premortem period.
The body autopsy of *lysis* patients detected 2% malignant systemic tumor and 17% thromboembolic events and pneumonia, not diagnosed in the premortem period.
Conclusions: the brain and body autopsies of lysis and non-lysis patients revealed differences in frequency of HT and non-CNS complications that need further examination.
Disclosure of interest: No

2261

In patients with large vessel occlusion acute ischemic stroke, the distribution of CTP capillary transit time heterogeneity voxel values differs in recanalized versus non-recanalized patients

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Background and aims: Perfusion CT (CTP) is used to assess tissue viability and predict outcome in acute ischemic stroke (AIS). Conventional CTP calculations struggles in differentiating penumbra and core. Capillary transit time heterogeneity (CTH) is a calculation used to analyse the microvascular environment. The aim of this study was to evaluate if CTH adds value to conventional cerebral blood flow (CBF) in patients with recanalization compared to patients without recanalization.
Methods: 62 IVT-treated AIS patients with large vessel occlusions (LVO) prospectively registered in a local thrombolysis registry underwent CTP in the acute setting and follow up magnetic resonance imaging (MRI) within 24 hours. 41 patients were treated with mechanical

thrombectomy. Final infarct core was manually outlined on DWI, and CBF and CTH voxel values were compared. Recanalization status was evaluated using time of flight MR angiography and digital subtraction angiography using modified treatment in cerebral ischemia (mTICI) scale (mTICI⩽2a not recanalized, mTICI >2a recanalized). 48 had, whereas 13 patients had no recanalization. CTH was normalized to normal appearing white matter by subtraction, CBF by division.
Results: For low CBF, there was a peak of normalized voxel values with medium high CTH for ischemic tissue in recanalized patients (figure 1). This was not found in patients without recanalization (figure 2).
Conclusions: In patients with LVO AIS and low normalized CBF values, the distribution of normalized CTH values seems to differ in recanalized patients compared to non-recanalized patients. This could have the potential to predict subsequent infarction in recanalized patients.

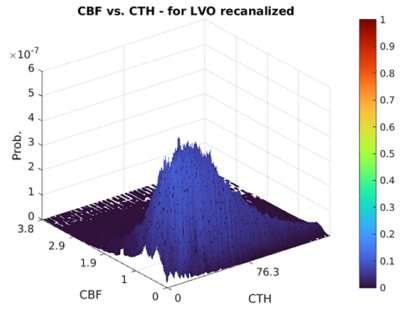

Figure 1: The height of the curve represents the proportion of voxels with a given combination of voxel values. The color of the curve represents the proportion of voxels for a given combination of voxel values with subsequent infarction on follow-up MRI in recanalized patients.

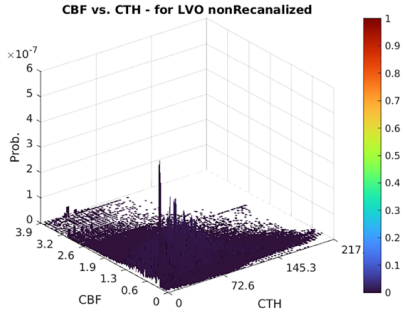

Figure 2: The height of the curve represents the proportion of voxels with a given combination of voxel values. The color of the curve represents the proportion of voxels for a given combination of voxel values with subsequent infarction on follow-up MRI in patients without recanalization.

Disclosure of interest: No

2308

RISK FACTORS FOR THE DEVELOPMENT OF INFARCT IN NEW TERRITORY AFTER ENDOVASCULAR STROKE TREATMENT

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Background and aims: The development of infarct in new territory (INT) is an important complication in the endovascular treatment (EVT) of acute stroke. The aim of our study was to investigate risk factors for the development of INT.
Methods: The files of patients who underwent EVT (MT; mechanical thrombectomy) for acute stroke between 2015 and 2022 were reviewed retrospectively. Development of INT, demographic data, vascular risk factors, clinical findings, treatments, EVT procedure and prognosis of all patients were recorded.
Results: 235 patients were included in the study and INT was detected in 23 (9.8%) patients. Smoking history (p: 0.022) was more common in the INT group compared to the non-INT group, door - groin puncture (p: 0.045), groin puncture - revascularization (p: <0.001) times were longer, number of passes (p: 0.001) and symptomatic cerebral hemorrhage (p: 0.032) were more frequent. Procedure technique (adjusted odds ratio [aOR], 2.465 ; 95% CI, 1.055–5.757; p:0.037) and symptomatic cerebral hemorrhage (aOR, 3.542; 95% CI, 1.135-11.054; p:0.029) were independent risk factors for the development of INT.
Conclusions: The development of INT after EVT of acute stroke is not uncommon. The choice of MT technique and the complication of symptomatic cerebral hemorrhage are risk factors associated with INT.
Disclosure of interest: No

2340

The combination of CTP CBV and transit time coefficient variation seems promising in predicting tissue outcome in large vessel occlusion AIS with subsequent recanalization

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Background and aims: Perfusion CT (CTP) is used to assess tissue viability and predict outcome in acute ischemic stroke (AIS). Current CTP calculations struggle in differentiating penumbra and core. Transit time coefficient variation (CoV) is a calculation used to analyse the microvascular environment. The aim of this study was to evaluate if CoV adds value to conventional cerebral blood volume (CBV) in the prediction of tissue outcome.
Methods: 62 IVT-treated AIS patients with large vessel occlusions (LVO) prospectively registered in a local thrombolysis registry underwent CTP in the acute setting and follow up magnetic resonance imaging (MRI) within 24 hours. 41 patients were treated with mechanical thrombectomy. Final infarct core was manually outlined on DWI, and CBV and CoV voxel values were compared. Recanalization status was evaluated based on time of flight MR angiography and digital subtraction angiography using the modified treatment in cerebral ischemia (mTICI) scale (mTICI⩽2a not recanalized, mTICI >2a recanalized). 48 patients had, whereas 13 had no recanalization. CoV and CBV were normalized to normal appearing white matter by division.
Results: For low CBV, there was a peak of normalized voxel values with CoV near 1 for ischemic tissue that did not develop into infarction in

recanalized patients (figure 1). This was not found in patients without recanalization (figure 2).

Conclusions: For low CBV, normalized CoV near 1 seems to be promising in predicting surviving tissue in patients with LVO AIS and subsequent recanalization.

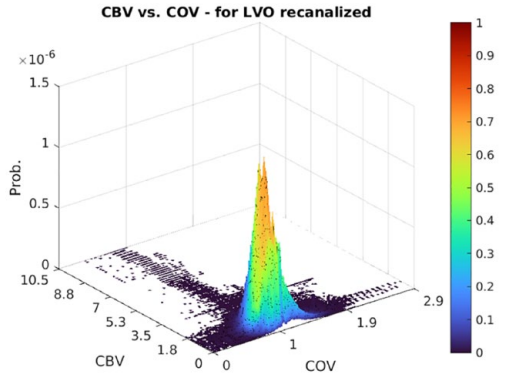

Figure 1: The height of the curve represents the proportion of voxels with a given combination of voxel values in the ischemic region. The color of the curve represents the proportion of voxels for a given combination of voxel values without subsequent infarction on follow-up MRI in patients with recanalization.

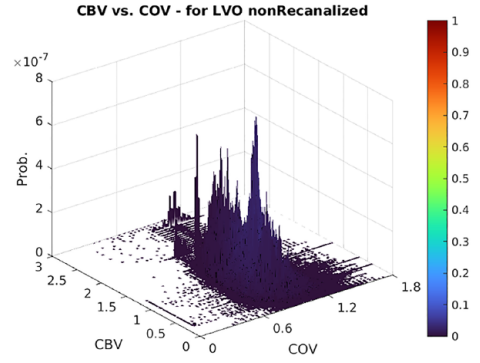

Figure 2: The height of the curve represents the proportion of voxels with a given combination of voxel values in the ischemic region. The color of the curve represents the proportion of voxels for a given combination of voxel values without subsequent infarction on follow-up MRI in patients without recanalization.

Disclosure of interest: No

PREVENTION

823

IMPACT OF METABOLIC SYNDROME ON EARLY PROGNOSIS AND OUTCOME IN BULGARIAN ISCHEMIC STROKE PATIENTS

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Background and aims: Ischemic stroke (IS) is a leading cause for severe disability and death in Bulgaria. According to the national database 40 000 patients are registered with IS annually. Globally, metabolic syndrome (MetS) is a recognized modifiable risk factor for cerebrovascular incidents. We conducted a prospective study aimed to assess the impact of MetS on the early prognosis and outcome in IS survivors.

Methods: Of all 166 IS patients admitted to Neurology Clinic UMHAT "Dr. Georgi Stranski", Pleven, Bulgaria, from January to June 2022, 60 were enrolled in the study. They were divided in two groups of 30 age and sex-matched IS patients each. The first group met MetS criteria and the control one included 30 non-MetS IS patients. The severity of IS was assessed using the National Institutes of Health Stroke Scale (NIHSS) on admission and discharge. Statistical analysis was performed with Statistical Package for Social Sciences ver. 24.0.

Results: On admission, severe stroke (NIHSS>16) had 30% of the patients in the MetS group and only 6.6% in the non-MetS group. Statistical analysis showed significant prevalence of severe stroke in the MetS group ($p<0.01$). At discharge, severe IS had 37% of the patients in the MetS group. Mortality rate was two-fold higher in the MetS group in comparison with the non-MetS group.

Conclusions: According to our data 18.1% of the admitted IS patients had MetS that is associated with poor outcome and higher mortality. These results correlate with the estimated prevalence for MetS in IS patients in Europe.

Disclosure of interest: No

1869

RISK FACTORS FOR RECURRENT ISCHEMIC STROKE: A SINGLE-CENTER STUDY IN HO CHI MINH CITY

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Background and aims: There are limited data regarding risk factors for recurrence of ischemic stroke in Vietnam. Our aim was to identify the risk factors for recurrent ischemic stroke in Vietnam.
Methods: This is a retrospective observational study including 88 patients with diagnosis of recurrent ischemic stroke admitted to the Neurology Department of Ho Chi Minh City University Medical Center from December 2019 to July 2020. The risk factors were registered and compared between early (within 1 year after the index stroke) and late recurrence (1 year or more after the index stroke).
Results: The most common vascular risk factors were hypertension (90%), diabetes (32%) and smoking (27%). Non-compliant antiplatelet therapy was found in 55 (66%) patients. Regarding the TOAST classification, the etiology could be classified in 69 (78%) patients: large artery atherosclerosis in 43 (49%), small vessel disease in 21 (24%), cardioembolism in 5 (6%) patients. Early recurrence was observed in 45 (51%) patients and late recurrence in 43 (49%) patients. About the etiology according to the TOAST classification, there were no significant differences between early and late recurrence groups (p=0.883).
Conclusions: Hypertension and non-compliant antiplatelet therapy were most common risk factors alerting to compliant risk factor prevention in reducing stroke recurrence. The highest rate of recurrence was in large artery atherosclerosis stroke suggesting of large artery atherosclerosis as an important etiology in recurrent ischemic stroke.
Disclosure of interest: No

2297

MODIFIED THERAPY IN POSTCOVID PATIENTS WITH ISCHEMIC STROKE: IS THERE ANY EFFECTIVENESS?

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Background and aims: The study and development of modified therapy in patients with ischemic stroke who previously had COVID-19 infection would contribute to the adjustment of approaches to the treatment in order to early rehabilitation and increase the effectiveness of treatment.
Methods: The initial parameters of the state of body functions according to the Sf-36, MOCA, HADS, Rivermide, Rankin and NIHHS scales were studied in 40 patients aged 60.7±0.92 years. The second group of patients with the same data and consisting of 30 people aged 60.3±1.4 years underwent the same study of the parameters of the state of body functions. The first group received a modified therapy consisting of standard therapy and anticoagulants with a transition to rivoraxaban 20 mg + therapy with 2-ethyl-6-methyl-3-hydroxypyridine succinate according to the scheme + enhanced exercise therapy. The second group received only standard therapy. The therapy lasted 3 months.
Results: Against the background of modified therapy, the rehabilitation time accelerates, which is confirmed by a significant ($p<0.01$) improvement in the indicators of the scales. In the second group of patients, not

so pronounced improvements in indicators were noted. In the first group, compared to the second group, recovery of life skills was observed earlier (p=0.05).
Conclusions: It is necessary and expedient to develop and modify therapy for patients with ischemic stroke with a burdened history. The effectiveness of the developed modified therapy has been confirmed in two third-party clinical databases and can be widely used in clinical practice.
Disclosure of interest: No

2369

Concentration of D-dimer as a predictor of ischemic stroke in COVID-19 in Tashkent

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Background and aims: D-dimer is a fibrin-degradation product which is increased in thrombotic events, indicating fibrinolysis. Measuring the level of D-dimer parameters from the early stage of the disease can also be useful in managing of COVID-19 and a predictor of thromboembolic complications.
Methods: We observed 40 patients among them 37.5% (15) was female as well as 62.5% (25) was male. During analyzing D-dimer level in their blood, the characteristics of the observed patients by age and sex, it was found that the average age of the patients was 60,5 (48-79) years. All patients were divided in 2 groups according to pneumonia in COVID-19 30 patients (15 female and 25 male) and thromboembolic complication in COVID-19 such as ischemic stroke 22 patients (8 female and 14 male).
Results: 1st group 22 patients (8 female and 14 male) with pneumonia in COVID-19 showed a moderate increase in terms of D-dimer level from 268ng/ml to 738ng/ml. 2nd group 18 patients (7 female and 11 male) with ischemic stroke in COVID-19 had a significant rise of D-dimer level in blood from 1195 ng/ml to 4873ng/ml. Most of the cases males D-dimer results were higher than females D-dimer.
Conclusions: Our research show a strong association between D-dimer levels and ischemic stroke in COVID-19 patients. Consequently, call for the daily assessment of D-dimer to assess disease progress in severely infected patients is preferable. Thus, anticoagulation therapy should be started once the D-dimer levels are >1000 ng/ml.
Disclosure of interest: No

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FEASIBILITY LEARNINGS AND STAKEHOLDER INFORMED REFINEMENTS FOR A COMPARATIVE EFFECTIVENESS TRIAL: TELEHEALTH-ENHANCED ASSESSMENT AND MANAGEMENT AFTER STROKE – BLOOD PRESSURE (TEAMS-BP)

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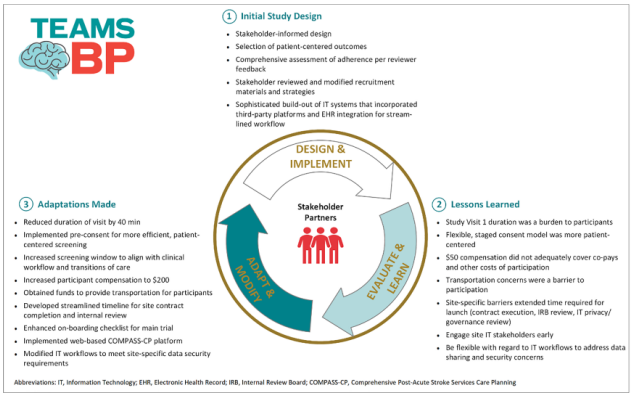
Background and aims: Hypertension is the strongest and most modifiable risk factor for secondary prevention of stroke. We previously demonstrated the effectiveness of a transitional care model for increasing blood pressure (BP) self-monitoring at 90 days post-discharge, which laid the groundwork for the current comparative effectiveness trial, Telehealth-Enhanced Assessment and Management After Stroke-Blood Pressure (TEAMS-BP). TEAMS-BP compares two evidence-based, stakeholder-vetted interventions for post-stroke BP management among adult stroke survivors discharged home: in-person Intensive Clinic Management (ICM) versus Intensive Tailored Telehealth Management (ITTM). TEAMS-BP consists of an 18-month feasibility phase followed by a multi-year trial.
Methods: The in-progress feasibility phase design seeks to: 1) demonstrate ability to screen, randomize, treat, and follow participants (n=100 across 3 sites) in a patient-centered randomized controlled trial and 2) identify study procedure modifications to enhance full trial success. Outcomes include 3-month systolic BP, patient activation, participation and adherence measures, and organizational readiness. Feasibility evaluation is guided by structured stakeholder engagement, encompassing clinical, patient/caregiver, information technology, community, health system, and policy-maker feedback to inform study improvements.
Results: As of 1/13/2023, 13 participants have been enrolled from 77 pre-screened eligible cases. Study interventions have been successfully delivered to 4 randomized participants. We have identified and implemented strategic modifications to optimize site start-up procedures, participant enrollment, and patient-centeredness (Figure).
Conclusions: Lessons learned from the TEAMS-BP feasibility evaluation have demonstrated the value of a pilot that enables real-time assessment of stakeholder-driven data to prepare for optimal implementation of a large-scale comparative effectiveness trial to improve post-stroke BP management.



Disclosure of interest: Yes

REHABILITATION AND RECOVERY

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CIRCADIAN TEMPERATURE IN MODERATE TO SEVERE STROKE PATIENTS

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Background and aims: Stroke patients often present circadian disruption due to multiple causes e.g. primary disease, comorbidities, medication, immobilization, reduced daylight entrainment and sleep disturbances. The objective is to investigate the circadian rhythm of temperature in forehead skin in patients with moderate to severe stroke admitted for rehabilitation.
Methods: A physiologic study in form of a secondary analysis of a former randomized study (ClinicalTrials.gov Identifier: NCT02186392). In total 27 patients with moderate to severe stroke were included between May 1st 2014, and June 1st 2015. Diurnal temperature was collected approx. 7 days after admission at the acute stroke unit by a skin surface temperature probe as part of a Polysomnography (PSG) measurement.
Results: Temperature variations show no circadian rhythm (Type 3 tests of fixed effects by SAS, $p = 0.1610$). The median temperature variance did fluctuate, but not significantly, and the small changes in circadian temperature variance did not follow the normal temperature variance.
Conclusions: Moderate to severe stroke patients show an abolished circadian rhythm of temperature, supporting the knowledge of presumed circadian rhythm disturbances after stroke. This suggests an unmet need for further exploration of underlying mechanism and potential management.
Disclosure of interest: No

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Effectiveness of using a robotic manipulation device with computer games based rehabilitation platform to improve manual dexterity in post-stroke clients

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Background and aims: There is a need to improve the engagement and accessibility of rehabilitation programs targeting manual dexterity in people with stroke. For this reason a low-cost robotic manipulandum device (RMD), equipped with monitoring and assistive technologies was developed for game-based repetitive task practice of a broad range of manual dexterity skills.
Methods: A crossover randomized controlled trial (RCT) with 16 stroke was conducted at participants First Step Wellness Centre in Manitoba and Regina to evaluate the feasibility and benefits of the game-based exercise program using the RMD. Participants received 10 weeks each (Twice per week) of the computer games-based exercise program using the RMD or a conventional therapy program.
Results: Structured interviews were conducted to evaluate participants' perspectives about expectations, acceptability and usability of the device and games. Quantitative analysis pre- to post-intervention included: (a) the Wolf Motor Function Test (WMFT) and (b) computer-game-based upper extremity (CUE) assessment. Results: The cross-over RCT study revealed that participants' expectations related to manual dexterity were addressed. Findings showed acceptable and engaging game-based task-oriented training with a high level of compliance rate. Significant improvements pre- to post-intervention were seen in the WMFT (15%) and in manual dexterity performance for the CUE test (18%) of a broad range of precision object manipulation tasks.
Conclusions: The present study demonstrates feasible trial procedures, acceptable goal-directed game-based exercises using the RMD and positive outcomes. These findings and the theoretical evidence will direct the next phase of a full-scale RCT for participants with stroke.
Disclosure of interest: No

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Medical and neurological complications of ischemic stroke: experience of the emergency department of HUC Oran (ALGERIA)

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Background and aims: Medical and neurological complications after acute ischemic stroke can negatively impact outcomes and, in some cases, may be preventable. Limited data exist regarding the frequency of these complications occurring in the first days and months after stroke and the relationship between these complications and outcome. Our objective was to identify the types, severity and frequency of medical and neurological complications following acute ischemic stroke and to determine their role in mortality and functional outcomes.
Methods: Rates of serious (life-threatening) and non-serious medical and neurological complications and mortality were derived from the placebo member of the database of the randomized trial of tirilazad mesylate in acute stroke. Complications were correlated with clinical outcomes using logistic regression techniques
Results: Of all the patients (n=577), 80% had at least one complication. The most frequent serious medical complication was aspiration pneumonia (5%), and the most frequent serious neurological complication was a new cerebral infarction or prolongation of the infarction on admission (4%). Mortality at 28 days was 14.9%, at 3 months at 27.9%, at 6 months at 31.9% and at one year at; 66% of these deaths were attributed primarily to medical complications. The results were significantly worse in patients with serious medical complications, concerning post-stroke disability 45.1% of patients had a Rankin score between 3 and 5 at discharge from the hospital and only 12.9% were discharged without neurological sequelae
Conclusions: Medical complications following ischemic stroke not only influence mortality, but may also influence post-stroke disability.
Disclosure of interest: No

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STROKE SURVIVOR INVOLVEMENT IN A STUDY OF REHABILITATION FOR VISUAL FIELD LOSS AFTER STROKE

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Background and aims: The Hemianopia Activity Based InTervention (HABIT) study is an NIHR-funded study to refine and operationalise an occupational therapy (OT) intervention for visual field loss after stroke. We explored the role of stroke survivor involvement in HABIT.

Methods: Meeting notes and correspondence were collated, supplemented by conversations with Study Management Group (SMG) members including two stroke survivors. Patient and public involvement (PPI) activities were identified, and the experience of stroke survivor SMG members explored. Barriers and facilitators to PPI were identified, along with how PPI impacted the study and how future PPI might be improved.
Results: Two core PPI activities were described in the original grant application: an initial focus group where stroke survivors contributed to co-design of the intervention; and stroke survivor SMG membership.
The role of stroke survivors on the SMG developed during the study, facilitated by having a nominated contact for them, and space for involvement in meetings, including a standing agenda item to provide feedback. Barriers included video calls due to visual impairment and file sharing.
Intervention improvements arising from PPI included: development of "success stories" for intervention materials; graphical representations of experience of visual field loss and core intervention components; development and curation of videos illustrating impact of visual field loss.
Stroke survivor SMG members contributed to documents, provided statements of support and robustly discussed study recruitment, research methods, health inequalities and accessibility.
Conclusions: Stroke survivor experience has been essential in developing a patient-focused intervention; this goes beyond what was originally anticipated.
Disclosure of interest: No

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INDICATORS OF BDNF AND CORTISOL IN POSTCOVID PATIENTS WITH ISCHEMIC STROKE IN TASHKENT

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Background and aims: The use of biochemical tests in the treatment of patients with ischemic stroke with anamnesis of COVID-19 infection would serve to adjust the approaches to the treatment
Methods: The parameters of the levels of BDNF and cortisol were studied in two 70 patients. The initial level of BDNF in post-COVID patients was significantly lower (740.6 pg/ml) than in patients without a history of COVID-19 (932.2 pg/ml, $p<0.05$). The first group received a modified therapy consisting of standard therapy and anticoagulants to it with a switch to rivoraxaban 20 mg additional therapy with 2-ethyl-6-methyl-3-hydroxypyridine succinate according to the scheme + enhanced exercise therapy. The second group of patients received only standard therapy. The therapy lasted 3 months. Analyzes were carried out between the data obtained before and after therapy against the background of data from healthy volunteers.
Results: Against the background of the therapy, a gradual significant ($p<0.01$) improvement in BDNF and cortisol parameters was observed and, accordingly, the rehabilitation period was accelerated. In the second group of patients, not so pronounced improvements in these indicators were noted. This was reflected in improved scores on the Rankin, Rivermead, MoCa, and NIHSS scores. An average negative correlation was established between the amount of the neurotrophic factor BDNF and cortisol during the treatment period.
Conclusions: Baseline low concentration of BDNF and high cortisol concentrations can be a predictor of slow regression of neurological and cognitive deficit. BDNF and cortisol parameters can be reliable indicators of the effectiveness of prescribed therapy.
Disclosure of interest: No

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Stroke in patients with large Ischaemic Core: Assessment of Reperfusion therapy Impact on Outcome (SICARIO) trial

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Background and aims: Endovascular thrombectomy (EVT) is effective for large vessel occlusion (LVO) stroke patients with small volumes of computed tomography perfusion (CTP)-defined ischemic core infarction within 24 hours from onset. There is little data available regarding EVT for patients with large cores. Observational studies suggest large benefits with core 50-70 mL. For those with core 70-100 mL there is strong suggestion of benefit, with the caveat of all non-radomised data. For core >100 mL there is insufficient data regarding benefits, or even potential harm, to justify a randomised trial. We propose a randomised controlled trial, using volumetric measures of large core (>70 mL).

Methods: *Design*: SICARIO is a basket trial designed to test the effect of EVT versus standard of care on 3-month mRS in two different populations. Sub-study 1 (CTP core 70-100mL) is a prospective, randomized, open-label, blinded endpoint, international, parallel 2-arm Bayesian Optimal Phase 2 (BOP2) design trial (Sample size: 150 patients). Sub-study 2 (CTP core >100mL) is a prospective, single arm, international, BOP2 design trial (Sample size: 180 patients).
Population: Ischaemic stroke patients with anterior LVO within 24 hours of onset with an ischemic core of >70mL and a premorbid mRS<3.
Primary Outcome: Substudy 1: Proportion of mRS 0-2 at 3 months. Substudy 2: Proportion of mRS 0-4 at 3 months.
Conclusions: SICARIO trial started recruitment in Australia in November 2022 and it will start internationally in 2023.
Disclosure of interest: No

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BATMAN: antibiotics against amyloid angiopathy

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Background and aims: Presence of amyloid-beta may induce a chronic state of cerebral inflammation by activating astrocytes, microglia and pro-inflammatory substances. Minocycline, an antibiotic of the tetracycline family, is known to modulate inflammation, gelatinase activity and angiogenesis. These processes are suggested to be key mechanisms in Cerebral Amyloid Angiopathy (CAA) pathology. Our aim is to show target engagement of minocycline and investigate in a double-blind placebo controlled randomized clinical trial whether treatment with minocycline (duration 3 months) can decrease markers of neuroinflammation and the gelatinase pathway in cerebrospinal fluid (CSF) in CAA patients.
Methods: The study population consists of 60 persons: 30 persons with hereditary Dutch type CAA (D-CAA) and 30 persons with sporadic CAA. They will be randomized for either placebo or minocycline (15 sporadic CAA and 15 D-CAA minocycline, 15 sporadic CAA and 15 D-CAA placebo). At baseline a standardized neuropsychological assessment will be performed. At t=0 and t=3 months the following biomarker data will be collected: 7T MRI vascular markers, CSF and blood biomarkers, general health assessment markers.
Results: Our primary endpoints are markers of neuroinflammation and the gelatinase pathway (IL6, MCP-1, IBA-1, MMP2/9, and VEGF) in CSF.
Conclusions: BATMAN started in December 2020 and until now 38 participants (27 with sporadic CAA and 11 with D-CAA) are included.
Disclosure of interest: No

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HOW MANY STROKE SURVIVORS DEVELOP PROBLEMATIC SPASTICITY THAT REQUIRES PHARMACOLOGICAL TREATMENT? RATIONALE AND PROTOCOL FOR AN OBSERVATIONAL, PROSPECTIVE, INTERNATIONAL STUDY

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Background and aims: While there is good evidence on the overall incidence of post-stroke spasticity (PSS), little is known about how many patients develop 'problematic' spasticity that would benefit from pharmacological treatment, and how early this develops.
Methods: Epitome is a prospective, observational, epidemiological study designed to evaluate the proportion of stroke survivors with paresis who, within 1 year of their stroke, develop 'problematic' PSS that would benefit from pharmacological therapy. The study will follow participants (18-85y) from 7 countries presenting with paresis ⩽2 weeks of a first-ever stroke that has occurred within ⩽4 weeks. Participants are monitored remotely at 2 weeks, 1-, 2-, 3-, 6-, 9- and 12-months post stroke to detect the onset of PSS using the Post stroke Spasticity Monitoring Questionnaire (PSMQ) (Zorowitz et al, 2017). If a patient is enrolled past any of these timepoints, their next timepoint is recorded. If the PSMQ indicates the possible presence of spasticity, patients undergo a full in-clinic assessment to confirm onset of PSS; patients without clinically confirmed PSS return to monitoring.
Results: For patients with confirmed PSS, the investigator will assess whether the patient has problematic spasticity that could benefit from pharmacological therapy. For the purposes of this study, problematic spasticity is defined as spasticity that causes patient impairment, impact on daily functioning, and/or impact on participation. Treatment plans will be documented including the reasons for treatment decisions.
Conclusions: Results from this study will inform on the scale of the clinical problems caused by PSS.
Disclosure of interest: Yes

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ACTION: ANAKINRA IN CEREBRAL HAEMORRHAGE TO TARGET SECONDARY INJURY RESULTING FROM NEUROINFLAMMATION – A PHASE II CLINICAL TRIAL

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Background and aims: Inflammation plays a vital role in the development of secondary brain injury after spontaneous intracerebral haemorrhage (ICH). Interleukin-1 beta is an early pro-inflammatory cytokine, and is a potential therapeutic target.
The ACTION trial aims to determine the safety and efficacy of treatment with recombinant human interleukin-1 receptor antagonist anakinra compared to standard medical management, and whether its effects are dose-dependent.
Methods: This is a phase-II, prospective, randomized, three-armed (1:1:1) trial with open-label treatment and blinded end-point assessment at 3 hospitals in the Netherlands. We will include 75 patients with supratentorial spontaneous ICH admitted within 8 hours after symptom onset.
Participants will receive anakinra in a high dose (loading dose 500mg intravenously, followed by infusion with 2mg/kg/h over 3 days; n=25) or in a low dose (loading dose 100mg subcutaneously, followed by subcutaneous

administration of 100mg twice daily for 3 days; n=25). The control group (n=25) will receive standard medical management.
Results: Primary outcome is subacute perihaematomal oedema after ICH, measured as oedema extension distance (OED) on MRI at day 7±1. A sample size of 25 participants per group allows to detect a reduction in OED from 0.6 (SD 0.25) in the control group to 0.4 in anakinra treated subjects (alpha 0.05, power 0.80), allowing 25% drop-out.
Secondary outcomes are safety of anakinra in ICH patient, effect on serum inflammation markers, MRI measures of blood brain barrier integrity and functional outcome at 90±7 days.
Conclusions: The ACTION trial is open for inclusion since August 2022.
Disclosure of interest: No

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Symptomatic Carotid Outcomes Registry with multi-center Evaluation (SCORE)

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Background and aims: Current treatment of symptomatic carotid stenosis relies on data that is more than 30 years old. There is no reliable information on the stroke rate with modern, intensive medical therapy. The aim of this pragmatic registry is to provide an estimate of the ipsilateral stroke rate for patients with 50-99% symptomatic carotid stenosis who have at least one feature suggesting reduced stroke risk.
Methods: Intensive medical therapy (IMT) will be provided to all participants. IMT consists of dual antiplatelet therapy (short-term), high potency statins, blood pressure control, and lifestyle modification with risk factor education. Criteria for enrollment include any of three clinical or radiologic markers. Clinical 1) Women 2) Retinal ischemic event only 3) Last symptomatic event >2 weeks ago. Radiologic: 1) TCD negative for emboli 2) MRI negative for intraplaque hemorrhage 3) High risk TIA with negative DWI. Follow-up is one year.
12 centers in the US and Canada are approved for enrollment.
Primary endpoint: Ipsilateral ischemic stroke within 12 months of enrollment.
Results: Study began enrollment in late 2022.
Sample size 114 patients
Enrollment as of Jan 2023: 2
Conclusions: SCORE Registry will provide valuable information on the stroke rate in patients with symptomatic carotid stenosis treated with intensive medical therapy. These data will allow clinicians to refine carotid stenosis decision making in symptomatic patients with >50% stenosis and potentially justify a future phase III RCT.
Disclosure of interest: No

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Progress with the International AVERT-DOSE trial: A phase III, multi-arm multi-stage covariate-adjusted response-adaptive randomized trial to determine optimal early mobility training after stroke

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Background and aims: Mobility training started early should be safe and effective given the right dose. AVERT DOSE is the first stroke rehabilitation trial to use an adaptive trial design to define the optimal mobility training for mild and moderate ischemic stroke patients in the acute phase.
Methods: This is an ongoing global Multi-Arm, Multi-Stage, Covariate-Adjusted, Response-Adaptive randomised trial. Patients in mild (NIHSS 0-7) and moderate (NIHSS 8-16) stroke severity strata are randomised to one of four mobility training regimens (including a pre-specified reference group), that starts within 48 hr and continues for up to 14 days. Inclusion criteria: Ischaemic stroke within 48 hours, ⩾18 years. Exclusion criteria: Severe stroke (NIHSS>16), medically unwell, no evident mobility problems. Primary Outcome: Proportion of participants achieving a favourable outcome (mRS score 0-2) at 3 months post stroke assessed by a Blinded Assessor. With a goal to recruit ~2,500 patients, adaptive sample size re-estimation provides 80% power to detect a 10% absolute treatment effect or larger compared to the pre-specified reference group, with a significance threshold of p=0.025 per stratum. Analyses will be intention-to-treat.
Results: All regions (Australia, Singapore, Malaysia, India, UK, Ireland and Brazil) are now actively recruiting with a total of 348 participants. Trial commencement has been challenging with significant ethics delays, and as a consequence of the COVID pandemic.
Conclusions: This final study in the AVERT series, AVERT DOSE will provide reliable guidance about the dose of early rehabilitation after ischaemic stroke. The results will be generalisable globally.
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Disclosure of interest: No

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Screening and patient-tailored care for Emotional and COgnitive problems in patients discharged home after ischemic stroke (ECO-stroke trial)

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Background and aims: Patients diagnosed with minor ischemic stroke are likely to be discharged home. A substantial number of these patients experience cognitive and emotional complaints, resulting in decreased quality of life and decreased participation. This study examines the effect of screening and patient-tailored care for cognitive and emotional problems in patients discharged home after ischemic stroke.
Methods: In a multicenter, single blinded, cluster randomized controlled trial, 12 hospitals will be randomized (1:1) to the intervention group or the usual care group. Patients discharged home after ischemic stroke

without rehabilitation care will be included. The intervention encompasses one consultation of 60 minutes executed by a specialized nurse at the outpatient clinics six weeks after the diagnosis. This consultation includes 1) screening for emotional and cognitive problems using sensitive instruments, 2) information provision and decision making according to the principles of self-management support and 3) a protocol for referral to specialized care if needed.

Results: The primary outcome will be the level of participation measured with the Restriction subscale of the Utrecht Scale for Evaluation of Rehabilitation-Participation at one year. Secondary outcomes will be the level of cognitive complaints, depression and anxiety, quality of life, patient-reported global health and physical disability at one year. Additionally, a cost-analysis will be performed. Finally, a mixed-methods study will assess the feasibility.

Conclusions: This study will analyze the clinical effectiveness, cost-effectiveness and feasibility of active screening and care for emotional and cognitive complaints compared to care as usual in patients discharged home after ischemic stroke.

Disclosure of interest: No

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Antiplatelet Secondary Prevention International Randomised trial after INtracerebral haemorrhaGe (ASPIRING)

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Background and aims: Survivors of stroke due to non-traumatic intracerebral haemorrhage (ICH) are at 7-19% annual risk of further major adverse cardiovascular events (MACE). In the REstart or STop Antithrombotics Randomised Trial (RESTART) for people with symptomatic occlusive vascular disease who survived ICH (ISRCTN71907627), starting antiplatelet therapy appeared safe and may have reduced the risk of MACE.

Methods: We seek to determine the effects of antiplatelet monotherapy compared to open control in all ICH survivors and investigate generalisability worldwide in the Antiplatelet Secondary Prevention International Randomised trial after INtracerebral haemorrhage (ASPIRING). The 120-participant external pilot phase started in September 2021 in China and Australia (NCT04522102). The main phase will start in mid-2024 and will recruit ⩾4,148 participants aged ⩾18 years who survive ⩾24 hours after symptomatic ICH and have not started antiplatelet or anticoagulant drug therapy after ICH at ⩾178 hospitals worldwide. Central computerised randomisation will assign participants (1:1) to start or to avoid antiplatelet monotherapy. All randomised participants will be followed for the primary composite outcome of all ischaemic and haemorrhagic MACE (non-fatal stroke, non-fatal myocardial infarction, or vascular death).

Results: In the external pilot phase, we have recruited 71 participants (five [7%] at nine sites in Australia and 66 [93%] at 14 sites in China). We have obtained funding for the main phase via the Global Cardiovascular Research Funders Forum (GCRFF) Multinational Clinical Trials Initiative for recruitment in the UK, Canada and The Netherlands.

Conclusions: Interested national leaders in other countries should contact Rustam.Al-Shahi@ed.ac.uk.

Disclosure of interest: Yes

879

Causal evidence for task regulation by anterior cingulate cortex: an experimental prospective study in patients with stroke in the frontal lobe

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Background and aims: With the number of stroke survivors rising, the incidence of post-stroke sequelae has significantly increased. This includes mood disorders and impairment in activities of daily living. Anterior cingulate cortex (ACC) is responsible for task regulation and decision-making. ACC dysfunction may be implicated in the development of post-stroke sequelae.

The aim of this study is to (1) investigate the impact of ACC damage on task regulation and (2) investigate the contribution of ACC to development of neuropsychiatric disorders.

Methods: Patients with frontal lobe stroke are recruited at Ghent University Hospital, Belgium (recruitment started April 2021). Participants perform the coffee-tea task (CTT), a hierarchical sequence task. MoCA and Oxford Cognitive Score (OCS) questionnaires are administered, and participants fill in the Beck's Depression Inventory (BDI) and Dysexecutive Questionnaire (DEX).

Results: We have currently recruited 48 patients: mean age 61,4 (±13,6), 21 female. 23 participants (48.9%) successfully completed the CTT. Mean MoCA score was 26,5±2,8 (n=38), mean OCS score was 120,9±10,1 (n=43). Mean BDI score was 10,4±9 (n=36), 6 patients (17%) had a score greater than 20 and suffered from clinical depression. Mean DEX score was 21,6±13,0 (n=36). There were no statistically significant differences ($p>0.05$) in these outcomes between ACC lesions vs. no-ACC lesions.

Conclusions: Preliminary analysis did not show a contribution of ACC lesions to worse performance of the CTT or higher BDI/DEX score. Fifty percent of the participants was able to complete the CTT, and MoCA and OCS scores did not reveal a severe cognitive impairment in this populatio

Disclosure of interest: No

885

Effects of Aerobic Exercise During the Early Rehabilitation After Ischemic Stroke

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Background and aims: In animal experiments, running wheel training improves stroke recovery. Further, exercise has a positive impact on fatigue, depression, and cognitive impairment – common long-term consequences of a stroke associated with high individual and economic burden. But controlling patient's exercise beyond the time of rehabilitation has been challenging. Wearable devices represent a potential solution here. We hypothesize that physical exercise will not only improve motor skills, but also counteract post-stroke fatigue, post-stroke depression and post-stroke cognitive impairment.

Methods: 30 stroke patients with mild to moderate stroke symptoms will be included within the first 14 days after the event. For the following 90 days participants in the intervention group are instructed to walk 30-45 minutes 3-5 times weekly. The intensity of walking is heart rate controlled by smartwatches. Motor function will be assessed by the fuglmeyer score in combination with an innovative testing by "speedzone", where patients respond to a visual signal. Cognitive functions are

evaluated by MoCA and SDMT; extent of fatigue and depression by FSMC, HADS-D and WHODAS. Further, we will perform flow cytometric analyses to characterize immunological effects. Structural correlates of functional repair shall be visualized by MRI-DTI.
Results: We have included the first patients in 2022 and are still recruiting. We aim to present results of these first patients.
Conclusions: We aim to identify subgroups of patients who benefit most from exercise as well as potential barriers to continued regular movement in stroke patients. The long-term goal is to adapt the study design for broad application.
Disclosure of interest: No

1154

A MULTIMODAL INDIVIDUALIZED INTERVENTION TO PREVENT FUNCTIONAL DECLINE AFTER STROKE. A RANDOMISED CONTROLLED TRIAL ON LONG-TERM FOLLOW-UP AFTER STROKE (THE LAST-LONG TRIAL)

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Background and aims: Physical and cognitive impairments are barriers to maintaining function after stroke. The main objective of LAST-long is to investigate the benefit of regular follow-up by a stroke-coordinator who sets up a treatment plan targeting the individual needs for follow-up to prevent functional decline in the long term after stroke.
Methods: A pragmatic randomised controlled trial, with repeated measures at 6, 12, and 18 months after inclusion, is applied. Patients admitted to four Norwegian hospitals will be screened for inclusion 3-months after stroke. A total of 300 patients, age$\geq$18, modified Rankin Scale (mRS)$<$5, able to understand Norwegian and willing to sign informed consent will be included. Patients with short life expectancy or other serious diseases will be excluded. The intervention consists of regular meetings with a community-based stroke-coordinator, who will use a checklist to assess the patients' risk-profile within physical health and lifestyle, mobility and ADL function, cognitive function, and social function. Accordingly, the coordinator will set up an action-plan based on national guidelines aiming to achieve the treatment goals.
Mixed models will be used to evaluate differences between the groups for the primary (mRS) and secondary endpoints (cognition, motor function, extended ADL, self-perceived health, quality-of-life, frailty, vascular events, caregivers burden, health costs, etc.) across the 4 time points.
Results: By January 16, 2023, 288 patients have been included at St. Olavs Hospital (n=125), Akershus University Hospital (n=91), Bærum Hospital (n=65) and Ålesund Hospital (n=7).
Conclusions: Follow-up will be concluded in 2024. ClinicalTrials.gov identifier: NCT03859063
Disclosure of interest: No

1303

EVALUATION OF MICROVASCULAR RAREFACTION IN VASCULAR COGNTIVE IMPAIRMENT AND HEART FAILURE: CRUCIAL-VCI

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Background and aims: Microvascular rarefaction (reduction of microvascular density) is thought to be an important mechanism in the pathophysiology of small vessel diseases such as vascular cognitive impairment (VCI) and heart failure with preserved ejection fraction (HFpEF). VCI and HFpEF often present together, and share identical cardiovascular risk factors. The international CRUCIAL consortium set out to develop novel non-invasive tools to determine microvascular health in both heart and brain using perfusion MRI, as well as easier and faster surrogate biomarkers of cerebral and/or cardiac rarefaction by investigating sublingual capillary health, vascular density of the retina, and mRNA sequencing of circulating endothelial-derived extracellular vesicles.
Methods: The clinical research program of CRUCIAL consists of several concurrent observational cohort studies in VCI patients, HFpEF patients and elderly controls. In CRUCIAL-VCI we aim to recruit 75 VCI patients and 40 controls. Main study endpoints are advanced brain and heart MRI markers for microvascular hypoperfusion and dysfunction, structural vascular brain MRI markers, cognitive function, and diastolic heart function. Regression analysis will be performed to investigate independent associations between perfusion measures in heart and brain, and measures of disease severity. Secondary study endpoints include sublingual flow-related capillary density, retinal vascular density on OCT angiography and microvesicles.
Results: Study protocol and patient information leaflet have been developed and ethical approval has been secured. Recruitment has been ongoing since December 2020. Currently we have recruited 34 VCI patients and 18 aged matched controls. First results are expected in 2024.
Disclosure of interest: No

1396

ESTABLISHMENT OF MAGENTIC RESONANCE IMAGING BIOMARKERS FOR DETECTION OF EARLY DISEASE PROGRESSION AND IDENTIFICATION OF THERAPEUTIC STRATEGIES IN CEREBRAL SMALL VESSEL DISEASE (SVD): EARLYPROG-SVD

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Background and aims: In patients with cerebral small disease (SVD) exhibiting white matter hyperintensities (WMH) of a similar extent, clinical manifestations such as ischemic stroke or cognitive decline show great interindividual variation. The microstructural mechanisms underlying those differences in the course of the disease and their sequential changes over time have not been sufficiently elucidated. A deeper understanding of these mechanisms and their timely relationship is necessary for the development and validation of meaningful imaging biomarkers for early disease progression, which might allow for identifying therapeutical strategies and evaluating their effects in clinical studies. Therefore, we set up a longitudinal neuroimaging study employing multimodal quantitative (q) magnetic resonance imaging (MRI) and diffusion tensor imaging (DTI) techniques to investigate in detail the microstructural integrity and connectivity of macroscopically affected and inconspicuous brain tissue over time in SVD.
Methods: 50 patients with SVD and 50 age-matched control subjects will be recruited for 3 T magnetic resonance imaging (MRI), comprehensive clinical assessment and cognitive testing (CERAD-Plus test battery) planned at seven different time points over a period of 5 years. Changes in high-resolution qMRI parameters with T1-, T2-, T2*-, and T2'-MR relaxometry as well as DTI measures including structural connectivity will be analyzed over time and their relationship with clinical features, conventional SVD imaging markers and tissue atrophy will be investigated.
Conclusions: EARLYPROG-SVD was designed to investigate short-term changes of the tissue microstructure and to identify potential imaging biomarkers of early disease progression in SVD, which might be useful for clinical studies.
Disclosure of interest: No

1509

ENHANCEMENT OF STROKE REHABILITATION WITH LEVODOPA (ESTREL-STUDY) - PROGRESS OF THE ONGOING MULTICENTER PLACEBO-CONTROLLED RANDOMIZED TRIAL

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Background and aims: The ESTREL trial investigates whether Levodopa given in addition to usual rehabilitative therapies results in a patient-relevant enhancement of motor recovery after acute stroke.
Methods: ESTREL (Enhancement of Stroke REhabilitation with Levodopa) is a multicenter, placebo-controlled, double-blind randomized superiority trial. Patients with an acute ischemic or hemorrhagic stroke and disabling hemiparesis requiring in-hospital rehabilitation are enrolled in 12 acute care centers within 7 days onset and later transferred to neurorehabilitation centers. Participants receive Levodopa 100mg/Carbidopa 25mg three times daily or matching placebo for 5 weeks in addition to standardized rehabilitative therapy. The primary outcome is the in between-difference of the Fugl-Meyer-Motor Assessment score 3 months after randomization. We present the characteristics of the first 400 of 610 patients to be enrolled
Results: 338 patients (84.5%) had an ischemic stroke. Participants had a median age of 73 [IQR 63-82] years and 40.8 % were female. At baseline, the median NIH-Stroke scale score was 8 [5-10]. Three month visits were performed in 369 patients (92.2%); 19 (4.75) died before the 90-days-visit, 9 (2.5%) withdrew from the study and 3 patients missed the clinical visit
Conclusions: The ESTREL study progresses successfully and few patients are withdrawing. This large trial in the field of neurorehabilitation will provide evidence whether the additional use of Levodopa in stroke rehabilitation is safe and effective.
Disclosure of interest: No

1602

TRIDENT COGNITIVE SUBSTUDY: PRELIMINARY RESULTS FROM A BRAZILIAN COHORT

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Background and aims: Intracerebral hemorrhage (ICH) is the most serious and disabling stroke type, accounting for up to 50% of strokes in low-to-middle-income countries. Cognitive decline and dementia are also high following ICH, due to the common underlying vasculopathy of cerebral small vessel disease (CSVD).
TRIDENT (Triple therapy prevention of Recurrent Intracerebral Disease EveNts Trial) main study aims to determine the effectiveness of the fixed low-dose triple combination of blood pressure-lowering agents (Triple Pill) on recurrent stroke and to evaluate the secondary outcome of cognitive decline and dementia.
The aim of this substudy is to assess the Triple Pill effectiveness on memory decline, cognition, and CSVD progression.
Methods: As part of TRIDENT, an international, multicenter, double-blind, placebo-controlled, parallel-group, randomized controlled trial in ICH approximately 200 participants will be included in Brazil. Participants recruited from TRIDENT local sites will be offered the opportunity to undergo additional cognitive assessments through gold-standard neuropsychological tests at baseline (until up to 6 weeks post-randomization), and 12 months. In parallel, MRI evaluation of these patients will be performed to assess CSVD progression through specific parameters at baseline and 12 months.
Results: The study recruitment is ongoing.
Conclusions: The substudy could potentially contribute to evaluating Triple Pill's effectiveness on cognitive decline, dementia, and CSVC progression in ICH patients.
Disclosure of interest: No

1655

NEUROMODULATION OF EXECUTIVE DYSFUNCTION IN PATIENTS WITH ACUTE STROKE USING TRANSCRANIAL DIRECT CURRENT STIMULATION (MODUL-EXE). A RANDOMIZED CONTROLLED TRIAL

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Background and aims: Research on the benefits of non-invasive brain stimulation-based interventions in improving executive functions (EEFF) of stroke patients is scarce. We aim to assess the efficacy of transcranial direct current stimulation (tDCS) combined with cognitive training for the rehabilitation of EEFF in acute stroke patients and to explore the underlying mechanisms.

Methods: Triple-blinded, randomized-controlled clinical trial including 60 fronto-striatal acute stroke patients with a Montreal cognitive assessment (MoCA) score <26. Participants will be randomized 1:1 to active tDCS (anode F3, cathode FP2, 20 minutes, 2 mA) or sham tDCS for 10 sessions followed by specific training of EEFF.

Results: The main efficacy outcomes will be MoCA score, Five-digit test (inhibitory control), Digit span task (working memory) and the abbreviated version of Wisconsin Card Sorting test (cognitive flexibility), assessed immediately after and during the following 12 months (one, three, six, and twelve months after intervention). Secondly, resting-state functional connectivity will be assessed by functional near-infrared spectroscopy. Blood biomarkers (neurotrophins, growth factors, and inflammatory molecules) will be analysed before and after the intervention.

Conclusions: To our knowledge, this is one of the first studies to evaluate the benefits of tDCS in the rehabilitation of EEFF in the acute phase of stroke. The study proposes a cutting-edge brain neuroimaging approach to longitudinally trace the effectiveness of the intervention, as well as the effect of neurostimulation on neuroplasticity-related blood biomarkers, which will help to understand the brain mechanisms involved in the rehabilitation of the dysexecutive syndrome.

Disclosure of interest: No

1774

COLCHICINE FOR THE PREVENTION OF VASCULAR EVENTS AFTER AN ACUTE INTRACEREBRAL HEMORRHAGE (COVASC-ICH)

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Background and aims: Intracerebral haemorrhage (ICH) survivors are at high risk of ischaemic vascular events. Colchicine is a promising treatment for ICH survivors as its anti-inflammatory effects may attenuate secondary (inflammatory) brain injury following an acute ICH and may reduce ischaemic major adverse cardiovascular events (MACE) without increasing the risk of bleeding.

Methods: CoVasc-ICH is a randomised, double-blind, placebo-controlled, phase II trial. In the vanguard phase, it aims to determine the feasibility of conducting a main phase trial. Adults within 48 hours of ICH onset who have established or risk factors for atherosclerotic disease and who consent are randomly assigned (1:1) to either oral colchicine 0.5mg once daily or matching placebo. The primary efficacy outcome collected in anticipation of continuation to a main phase trial is MACE over a median of 12 months. Safety outcomes include symptomatic ICH expansion and recurrent ICH. An MRI sub-study is investigating whether colchicine attenuates peri-haematomal oedema volume and number of DWI hyperintense lesions on MRI. This trial is registered (NCT05159219) and is open to recruitment.

Results: Recruitment has commenced with 9 participants enrolled to date at 5 sites and will continue until the enrollment of 100 adult participants at a target of 12 high volume Canadian stroke centers in the vanguard phase.

Conclusions: Colchicine is a low-cost approach that has the potential to change clinical practice and improve outcomes after ICH. The vanguard phase will provide factual prerequisites essential for design refinement and funding of the subsequent main phase trial.

Disclosure of interest: No

1807

IN PATIENTS WITH EMBOLIC STROKE OF UNDETERMINED SOURCE (ESUS), THE SYSTEMIC INFLAMMATORY RESPONSE INDEX (SIRI) CAN INDICATE A POOR PROGNOSIS

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Background and aims: Biomarkers that can predict the prognosis of patients with embolic stroke of undetermined source (ESUS) might be helpful. Systemic inflammatory response index (SIRI) is a marker for chronic inflammation based on monocyte, neutrophil, and lymphocyte counts. The effect of SIRI on outcome in ESUS has not been investigated.

We addressed SIRI as a potential biomarker for ESUS patients' poor functional outcome.
Methods: The study enrolled consecutive patients who underwent comprehensive examination, including transesophageal echocardiography. SIRI was calculated using a complete blood count from routine blood test and defined as neutrophil count X monocyte count / lymphocyte count (10^9/L). A routine blood test was conducted within 24hours of admission or transfer. Poor outcome was defined as modified Rankin Scale (mRS) score⩾3 at 3months after onset of stroke.
Results: Among 829 patients, mean age was 63.2±13.1 years and 62.4% were men. 141 (17.0%) patients had poor outcomes. Patients with poor outcomes had higher SIRI than those with good outcomes (0.97, interquartile ranges [IQR] 0.66-1.69 vs. 0.83, IQR 0.52-1.31, p=0.008). SIRI was related to poor outcome, in an univariable (adjusted odds ratio [aOR] 1.131, 95% confidence interval [CI] 1.024-1.249) and multivariable (aOR 1.112, 95% CI 1.007-1.227) logistic regression analysis.
Conclusions: This study suggested that SIRI was significant biomarker for poor outcome at 3months in ESUS patients with hypertension and initial National Institute of Health Stroke Scale score. Elevation of SIRI indicates that hightened systemic inflammation and reduced immune response, which is associated with poor outcome in ESUS patients.
Disclosure of interest: No

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EFFICACY OF NITRIC OXIDE IN STROKE-2 (ENOS-2): RATIONALE AND DESIGN OF A PHASE IIB SINGLE BLIND RANDOMISED CONTROLLED SINGLE-CENTRE TRIAL

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Background and aims: High blood pressure (BP) common in stroke, is associated independently with increased recurrence, dependency, or late death. Nitric oxide (NO) donors including glyceryl trinitrate (GTN) are candidate treatments for acute stroke. Whether GTN improves outcome through reducing expansion and recurrence or worsens it through reducing cerebral blood flow remains unclear.
We aim to assess the feasibility of recruitment and safety of GTN to inform the design of a definitive trial
Methods: 120 adult patients [100 ischaemic stroke(IS) and 20 intracerebral haemorrhages(ICH)], characterised by systolic BP >120mmHg, will be recruited within 3-5 hours of onset. Exclusion criteria include; seizure, mRS⩾4, glucose <3mmol/l, GCS<8, known stroke mimic, life expectancy <6months, known sensitivity to Duoderm and contraindications to GTN.
Patients will be randomised (1:1) to receive 5mg GTN or matching comparator Duoderm patch placed on back or shoulders applied for 2 days. Patients, researchers, and outcome assessors will be masked to treatment allocation.
Feasibility outcomes include recruitment of 100 IS and 20 ICH patients, rate of recruitment, proportion of patients approached being randomised, adherence to treatment and follow up. Secondary outcomes include BP and heart rate over the first 2 days, discharge destination, serious adverse events up to day 2, fatal SAEs up to day 90, mortality, disability, cognition, mood, and quality of life at day 90.
Results: As of 17th Jan 2023, 20 participants have been recruited to the ENOS-2 trial.
Conclusions: ENOS-2 will provide definitive evidence for the use of GTN in acute stroke.
Disclosure of interest: No

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THE METOCLOPRAMIDE FOR AVOIDING PNEUMONIA AFTER STROKE (MAPS-2): A SINGLE-BLIND RANDOMIZED CONTROLLED TRIAL OF METOCLOPRAMIDE FOR PREVENTION OF PNEUMONIA AFTER STROKE

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Background and aims: Pneumonia causes more deaths than neurological damage after stroke. Stroke-associated pneumonia is caused by aspiration of vomited/regurgitated gastric content. We assess whether Metoclopramide (MCL), an antiemetic, prevents pneumonia and reduces mortality when given early after stroke onset.
Methods: 2100 adults within 9 hours of stroke onset, moderate to severe neurological impairment (NIHSS⩾10) or dysphagia and NIHSS⩾6, without definite/probable pneumonia at screening, contraindications to MCL, pregnancy, and life-limiting comorbidities will be recruited from 60 or more UK hospitals.
Patients will be randomised (1:1) by minimisation on age, mRS, NIHSS, type of centre and time from onset, to receive 10mg of MCL/placebo (normal saline 2ml) tds via injection or nasogastric tube for 14 days. Follow-up will be conducted at day 14 in person and at 6-months by telephone.
The primary outcome is all-cause mortality by 6 months. Secondary outcomes include pneumonia diagnosis, number of days of antibiotic treatment, quality of life(QOL), swallow, and neurological recovery at day 14 and mRS, frailty, QOL, swallow recovery, and home time at 6-months.
Results: As of 5th of January 2023, 104 (5%) participants have been recruited to MAPS-2 trial. Baseline characteristics can be seen in Table 1.
Conclusions: MAPS-2 results will provide definitive evidence for the effectiveness of metoclopramide in reducing pneumonia and deaths after acute stroke.

Table 1.

Baseline characteristics	Statistics
Onset to randomisation,(minutes)	320.5 [221.5, 451.0]
Age,(years)	78.6 (11.5)
Sex,(males)	51 (49.0%)
pre-stroke mRS	1.0 [0.0, 2.0]
NIHSS	17.0 [13.0, 21.0]
Clinical Frailty Scale	3.0 [2.0, 5.0]

Disclosure of interest: No

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ALAMEDA- AN OPORTUNITY FOR AT-HOME NEUROLOGIC REHABILITATION (INTERIM MEDICAL TEAM FEEDBACK)

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Background and aims: The objective of ALAMEDA research project is to develop technologies to monitor the rehabilitation process. It involves 3 pilot studies, one for each disease, Greece - Parkinson`s disease, Italy - Multiple Sclerosis, and Romania - Acute ischemic stroke (AIS) and 15 international partners.

Methods: To monitor patients for 12 months, a number of measurement devices were developed: belt (troncular ataxia), insoles (walking), watch (amount of physical activity), mattress (sleeping), bracelets (muscle strength), phone and tablet questionnaires/games (emotional/cognitive status). Until now, 12 out of 15 patients with AIS were enrolled in the Romanian pilot.

Results: The medical team considers the devices user-friendly, yet some problems were observed.

At home internet connection is necessary for the patients in order to benefit from this project.

The smartphone questionnaires are easy to perform, but some of the questions didn`t work and needed succesive updates.

The insoles were designed to be attached to shoes, but the patients only wore them in the hospital, using slippers. One patient withdrew from the study because he accidently fell while using them. Also, they had difficulty changing the batteries. The mattress had to be restarted after every patient. The belt does not provide feedback when data is sent to the server.

No difficulties were reported regarding the smartphone, smartwatch or bracelets.

Conclusions: ALAMEDA offers the oportunity to monitor and improve motor and cognitive recovery for patients who folllow at-home rehabilitation, while being under the guidance of a medical team.

Disclosure of interest: Yes

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REMOTE ISCHAEMIC CONDITIONING AFTER STROKE 3 (RECAST-3): A MULTICENTRE RANDOMISED CONTROLLED TRIAL

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Background and aims: Remote ischaemic per-conditioning (RIC) in experimental ischaemic stroke is cytoprotective and may reduce ischaemic reperfusion injury. It is achieved by repeated transient occlusion of the blood supply to a limb using a blood pressure cuff.

We aim to assess RIC in patients with hyperacute ischaemic stroke.

Methods: RECAST-3 is a prospective, randomised, controlled, blinded-endpoint, parallel-group, multicentre trial. 1300 adults with hyperacute ischaemic stroke (<6 hours post onset, NIHSS ⩾4) presenting to Stroke Units in the UK will be recruited. Exclusion criteria include; pre-morbid dependency, spontaneous intracerebral haemorrhage, dementia, coma, malignancy, significant co-morbidity, BM <3.0mmol/L, systolic blood pressure >185mmHg and seizure on presentation unless brain imaging identifies significant brain ischaemia.

Participants will be randomised (1:1) to receive either RIC (5 cycles alternating between 5 minutes inflation to 200mmHg and 5 minutes deflation) or sham (60mmHg). A second dose will be administered 1-2 hours later. Two further doses are given on the following day.

Results: The primary outcome is death or dependency (ordinal shift in the modified Rankin Scale) at day 90 recorded using central blinded telephone follow-up. Secondary outcomes include cerebrovascular events, major adverse cardiac and cerebral events, acute kidney injury, disability, cognition, mood, frailty, quality of life, and safety.

Conclusions: RECAST-3 will provide evidence for the use of RIC in hyperacute stroke. The results will inform on the safety and improvement of the functional outcome in patients for standardised practice in hyperacute stroke treatment.

Disclosure of interest: No

2121

TRANEXAMIC ACID FOR INTRACEREBRAL HAEMORRHAGE 3 (TICH-3): RATIONALE AND DESIGN OF A PHASE III DOUBLE BLIND RANDOMISED CONTROLLED MULTI-CENTRED SUPERIORITY TRIAL

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Background and aims: Intracerebral haemorrhage (ICH) a medical emergency causes more than 1.7 million strokes worldwide/year with over 40% mortality. Tranexamic acid (TXA) when given early, reduces mortality and haematoma expansion in spontaneous ICH. The haemostatic effect of TXA was demonstrated in prior pilot studies.

We aim to assess the clinical effectiveness of TXA after ICH and determine whether TXA should be used in clinical practice.

Methods: TICH-3 is a pragmatic phase III prospective blinded randomised placebo-controlled trial. 5500 adult patients with ICH will be recruited within 4.5 hours of onset across UK and International sites. Exclusion criteria include known indication for TXA, contraindications for TXA, known to be on anticoagulation, massive ICH(>60ml), severe coma(GCS<5) and palliative care.

Rapid emergency consent will take place and patients will be randomised (1:1) by simple randomisation to receive intravenous TXA 2g; 1g bolus loading dose given as 100ml infused over 10 minutes, followed by another 1g in 250ml infused over 8hrs or matching placebo. Patients, relatives, researchers, and outcome assessors will be masked to treatment allocation.

The primary outcome is mortality by day 7. Secondary outcomes include dependency (using the modified Rankin Scale), Quality of Life (including health economics outcomes) at day 180, serious adverse events(SAE) up to 7 days, and fatal SAEs up to day 180.

Results: As of 17th of January 2023, 109 participants have been recruited to the TICH-3 trial.

Conclusions: TICH-3 results will provide definitive evidence for the effectiveness of TXA clinical usage which could change clinical practice globally.

Disclosure of interest: No

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PREHOSPITAL TRIAGE OF PATIENTS WITH A SUSPECTED ACUTE STROKE (PRESTO-2): DEVELOPMENT, IMPLEMENTATION AND EVALUATION OF A DECISION SUPPORT TOOL

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Background and aims: Prehospital triage of suspected stroke patients aims to eliminate the need for interhospital transfers for patients with ischemic stroke caused by a large vessel occlusion (LVO) eligible for endovascular thrombectomy (EVT), expediting time-to-EVT and improving long-term functional outcome. Triage may be facilitated by using prehospital stroke scales, instruments designed to identify patients with LVO in a population of suspected stroke. These scales use crude cut-points and do not account for important characteristics other than stroke severity. We aim to develop, implement and evaluate a novel decision support tool, which provides a personalized triage advice by incorporating the RACE-scale, onset-time, GPS-based driving times, hospital-specific workflow metrics and time-dependent treatment effect.
Methods: We designed the Stroke Triage App, an application which will be provided to paramedics through iOS, Android and webapp. The application will be implemented in two regions in the Netherlands, encompassing ±1,800,000 inhabitants. The application provides an advice by comparing probability of good functional outcome (mRS0-2) between two transportation strategies. The primary outcome will be difference in onset-to-groin-time in the year before and after implementation, compared to a control region with a difference-in-differences linear regression analysis.
Results: The Stroke Triage App has been designed and the study protocol is awaiting MEC approval. We plan to include ±5,000 suspected stroke patients over the course of one year.
Conclusions: Our project will implement and evaluate a novel form of prehospital triage, which takes stroke severity, onset-time, geographical factors and hospital-specific workflow times into account. Results are expected in 2024.
Disclosure of interest: No

2223

Randomization To Endovascular Treatment Alone Or Preceded By Systemic Thrombolysis With TNK In Acute Ischemic Stroke Due To Large Intracranial Vessel Occlusion Trial - Resilient Direct TNK

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Background and aims: Recently completed studies have questioned the benefit of IV thrombolysis with alteplase before mechanical thrombectomy (MT) in acute ischemic stroke (AIS) patients with large vessel occlusion (LVO). Other studies have also suggested that tenecteplase (TNK) administration before MT might provide higher recanalization rates than alteplase. We aim to evaluate whether the combination of TNK and mechanical thrombectomy is superior to direct thrombectomy in AIS patients with LVO.
Methods: Randomized, prospective, multicenter, placebo controlled clinical trial in patient with AIS due to LVO of the anterior circulation (M1 or M2 segments of the MCA) < 4.5 hours of symptoms onset. Randomization will be 1:1 according to reperfusion treatment modalities: (A) direct mechanical thrombectomy (placebo controlled) vs. (B) Intravenous thrombolysis with TNK (0.25 mg/kg) plus mechanical thrombectomy. The primary outcome will be the ordinal distribution from the modified Rankin scale (mRS) at 90 days.
Results: The sample size was projected to be 530 patients divided in the two arms, including two pre-planned interim analysis after reaching 50% and 75% of the recruitment target. We have enrolled 20 patients so far.
Conclusions: RESILIENT DIRECT TNK trial will evaluate the hypothesis that in AIS patients with anterior LVO < 4.5 hours of symptoms, MT preceded by TNK is superior to MT alone to achieve more favorable outcomes measured by mRS scores at 90 days. NCT05199194
Disclosure of interest: Yes

2238

Adjunctive Intra-arterial Tenecteplase for Incomplete Revascularization After Mechanical Thrombectomy: The ALLY Pilot Trial

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Background and aims: The results of the Chemical Optimization of Cerebral Embolectomy (CHOICE) trial, which examined adjunctive intra-arterial alteplase or placebo after successful thrombectomy in acute ischemic stroke (AIS) with large vessel occlusion (LVO), demonstrated improved 90-day functional outcomes in the treatment group. However, there is a paucity of data on the safety and efficacy of other intra-arterial thrombolytics after incomplete thrombectomy.
The Adjunctive Intra-arterial Tenecteplase Following Mechanical Thrombectomy (ALLY) pilot trial aims to evaluate the feasibility and safety of intra-arterial tenecteplase (TNK) as an adjunctive therapy in AIS

with LVO in the anterior circulation who fail to reach complete revascularization (mTICI 3) after mechanical thrombectomy.
Methods: ALLY is an investigator-initiated, US, single center, non-randomized pilot trial to assess the feasibility of intra-arterial TNK following standard of care mechanical thrombectomy in patients with AIS. Eligible patients will receive intra-arterial TNK after achieving mTICI 2b or 2c reperfusion. Up to 20 patients will be enrolled into the study and followed for 3 months after treatment with intra-arterial TNK.
Results: The primary safety endpoint is the incidence of any intracranial hemorrhage and neurologic worsening of at least 4 points on the National Institute of Health Stroke Scale within 24 hours of treatment with intra-arterial TNK. Secondary outcomes include 90-day functional outcome, mortality, and improvement of reperfusion grade.
Conclusions: Screening and enrollment in the ALLY trial began in April 2022 and recruitment is ongoing. We anticipate enrollment into ALLY will be completed in February 2023 and results will be available in May 2023.
Disclosure of interest: No

2278

OPTIMAS: A RANDOMISED CONTROLLED TRIAL TO ESTABLISH THE OPTIMAL TIMING OF ANTICOAGULATION AFTER ACUTE ISCHAEMIC STROKE

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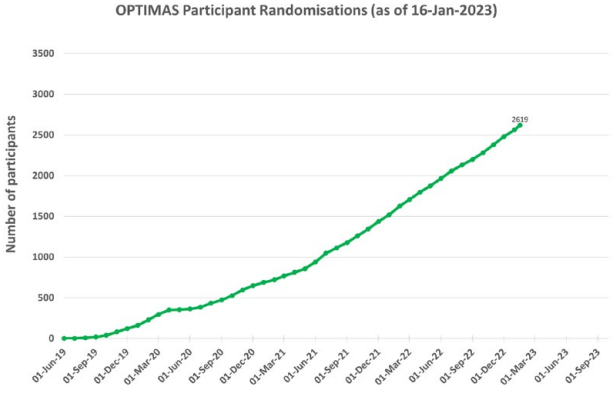
Background and aims: Atrial fibrillation (AF) causes about 20% of ischaemic strokes, with a high risk of early recurrence. Anticoagulation is highly effective for long term ischaemic stroke prevention, but risks and benefits in the acute phase remain unclear, particularly for moderate-to-severe stroke. OPTIMAS is a large multicentre RCT aiming to establish the safety and efficacy of early anticoagulation with a direct oral anticoagulant. Available evidence and guidelines emphasise the lack of evidence to guide clinicians and support randomisation into trials.
Methods: OPTIMAS will enrol 3,478 participants with ischaemic stroke and AF from UK stroke services. Participants are randomised 1:1 to early (within 4 days) or standard (day 7 to 14 after stroke) initiation of anticoagulation. Follow-up is at 90 days, blinded to treatment allocation. The primary outcome is the incidence of stroke due to ischaemia or intracranial bleeding, and systemic arterial embolism.
Results: OPTIMAS opened in June 2019 and is recruiting from 86 sites. 2,616 participants have been randomised as of 16th January 2023. Recruitment was reduced during the COVID-19 pandemic but we developed a successful contingency plan, implementing strategies including: central follow-up; telephone consent; and the NIHR Associate PI Scheme. OPTIMAS recruitment is now exceeding pre-pandemic levels; we are currently consistently recruiting 80 – 100 participants per month.
Conclusions: OPTIMAS will determine the efficacy and safety of early anticoagulation in a large population of patients with acute ischaemic stroke and AF. The trial recruited successfully during the most challenging period of the COVID-19 pandemic and continues to do so.
Disclosure of interest: No



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Randomization To Extend Stroke Intravenous Thrombolysis In Evolving Non-large Vessel Occlusion With TNK (RESILIENT EXTEND-IV)

Gisele Sampaio*[1], Raul Nogueira[2], Octavio Pontes-Neto[3], Leonardo Augusto Carbonera[4], Ana Claudia de Souza[4], Maramélia Miranda Alves[1], Fabrício Oliveira Lima[5], Jamary Oliveira-Filho[6], Eva Carolina Andrade Rocha[1], Leticia Rebello[7], Joao Andrade[1], Sheila Cristina Ouriques Martins[4]
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Background and aims: In patients with AIS caused by large vessel occlusion (LVO) treated in the extended time window, with CTP selection, better outcomes were obtained with tenecteplase (TNK) versus tPA regarding arterial reperfusion and clinical outcomes. Other studies showed similar results comparing TNK to tPA. None of these trials compared TNK in non-LVO AIS in the extended time window.
Methods: Prospective, multicenter, randomized, controlled, double-blinded trial with an adaptive design and population enrichment. The randomization employs a 1:1 ratio of intravenous thrombolysis with TNK versus placebo in patients who suffer a non-LVO AIS between 4.5 and 12 hours from the TLSW and have evidence of salvageable brain tissue on perfusion imaging. The primary outcome will be the distribution of the mRS scores at 90 days (shift analysis) as evaluated by two separate assessors at the central core lab, with local reading as a backup mechanism.
Results: The study recruitment is ongoing, with the first interim analysis planned for late 2023, including 386 patients with completed 90-days follow-up. The total estimated sample size is 642 patients. Enrollment is ongoing at seven sites. In January 2023, seven subjects were enrolled.
Conclusions: The RESILIENT EXTEND-IV trial may provide inputs on the efficacy and safety of TNK use in non-LVO AIS in the extended time window.
Clinical trials registry: NCT05199662. Tenecteplase/Placebo donated by Boehringer Ingelheim. This research is funded through the Program of Institutional Development of the Brazilian Unified Health System (PROADI-SUS), Hospital Moinhos de Vento.
Disclosure of interest: No

2403

Combination Antithrombotic Therapy to prevent recurrent Ischemic Stroke in Intracranial Atherosclerotic Disease (CATIS-ICAD)

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Background and aims: IntraCranial Atherosclerotic Disease (ICAD) is common with high risk of recurrence. The COMPASS trial showed a 49% reduction of ischemic stroke with low-dose rivaroxaban plus ASA compared to ASA in patients with systemic atherosclerosis with no increase in ICH or hemorrhagic transformation.
Methods: CATIS-ICAD is an open-label, blinded endpoint, randomized, investigator-initiated pilot study to assess recruitment feasibility and the safety of low-dose rivaroxaban plus ASA for stroke prevention in symptomatic ICAD with 30-99% stenosis. Safety outcomes include ICH or any major bleeding. Patients receive a baseline and end of study MRI to assess for covert infarcts.
Results: Recruitment of 101 patients was completed in August 2022 with follow-up to be completed by August 2023. Mean age was 67(SD11.1) and 28% were female. Hypertension 78%, dyslipidemia 75%, diabetes 32% and prior stroke 13% were common risk factors. Median NIHSS at randomization was 2.0(IQR1.0,3.0). In 80(79%) participants qualifying event was an ischemic stroke. Half (50%) of the participants had 70-99% stenosis, 30% had 30-49% and 20% had 50-69%. No intracranial bleeding or major hemorrhage has occurred during follow-up to date.
Conclusions: If low-dose rivaroxaban plus ASA is proven to be safe and effective in patients with ischemic stroke/TIA secondary to ICAD, it would have an important clinical impact as ICAD is one of the most common causes of stroke with high recurrence risk.
Disclosure of interest: No

2472

The COMPEX-trial: Computer-assisted self-training to improve executive function versus unspecific training in patients after Stroke, Cardiac arrest or in Parkinson's Disease: A protocol for a randomized clinical trial

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Background and aims: Patients often experience working memory impairments after brain injuries or in brain diseases. This leads to decreased ability to live independently and decreased quality of life. There is a need for cost-effective rehabilitation methods to mitigate these symptoms.
The purpose of this trial is to identify if Computer-Based Cognitive Rehabilitation (CBCR) is an effective method to mitigate working memory impairments.
CBCR can mitigate working memory impairments impairments after brain injuries or in brain diseases resulting in increased ability to live independently and increased quality of life. Training with a specific emphasis on working memory has a significantly greater impact compared to generally cognitively stimulating activities performed on a computer.
Methods: A Multicenter randomized clinical trial across four European countries: Denmark, France, Sweden and Switzerland. 700 patients (400 with stroke, 200 with Parkinson's disease and 100 with cardiac arrest) will be randomly assigned to specific or unspecific CBCR for eight weeks, five hours a week.
Outcome measures: 1) Primary outcome: ADL-functioning from MDS-HC-IADL, 2) Neuropsychological tests of working memory and related cognitive functions 3) Measures of quality of life. Outcome measures are tested at baseline, directly after the training periods (eight weeks after inclusion) and at follow-up to assess long-term effects (five months after inclusion).
If CBCR is effective, it can be implemented directly into clinical practice as a cost-effective rehabilitation method.
Results: Expected 2024
Conclusions: Expected 2024
Disclosure of interest: No

2542

A randomised controlled trial of the effectiveness of surface neuromuscular stimulation using the geko™ device compared with intermittent pneumatic compression to prevent venous thromboembolism in immobile patients with acute stroke (GEKO Study)

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Background and aims: Venous thromboembolism (VTE) is a potentially fatal complication of stroke. Based on the results of the CLOTS-3 study Intermittent Pneumatic compression (IPC) is recommended for prevention. About 30% of patients have contraindications to or cannot tolerate IPC. Surface neuromuscular stimulation (SNMS) using the geko™ device improves venous flow by stimulating the peroneal nerve, leading to rhythmic dorsiflexion of the foot. It is easier to use and better tolerated than IPC. The aim of the GEKO study is to assess whether SNMES using the geko™ device is more effective than IPC at preventing VTE in immobile stroke patients.
Methods: DESIGN: Single blind randomized controlled trial
INTERVENTION: Pulsed SNMES using the geko™ device for 30 days
CONTROL: IPC for 30 days

INCLUSION CRITERIA

1. Adults admitted to hospital with a diagnosis of acute stroke and
2. Within 36 hours of symptom onset and
3. Unable to mobilize to the toilet without help

EXCLUSION CRITERIA: Clinically apparent DVT at screening, allergy to the hydrogel, contraindications to IPC, moribund, inability to gain consent.
FOLLOW-UP: Leg Doppler at 7 and 14 days; VTE, device tolerance, neurological recovery, concomitant treatments and adverse events at 30 days; Survival, VTE, leg pain, disability, quality of life, and home time at 90 days.
PRIMARY OUTCOME: Any VTE at 30 days
SECONDARY OUTCOMES: Survival, VTE, leg symptoms, disability, quality of life, and home time at 90 days.
Results: 1200 participants will be recruited from 10-20 UK hospitals.
Conclusions: The study will open to recruitment in April 2023.
Disclosure of interest: Yes

2601

PROTOCOL FOR A RANDOMISED PILOT STUDY OF A NOVEL COGNITIVE REHABILITATION INTERVENTION IN STROKE (STROKECOG-R STUDY)

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Background and aims: Cognitive impairment is a common post-stroke sequela, present in 50% of patients six months post-stroke, and is associated with increased disability, poorer quality of life, and risk of long-term care. Despite its prevalence, the challenges for patients/carers, and the significant costs to the healthcare system, the efficacy of cognitive rehabilitation following stroke remains unclear. The aim of this pilot trial is to test a novel cognitive rehabilitation intervention (StrokeCog-R) to improve/prevent further decline in post-stroke cognitive impairment (PCSI). We will examine feasibility of recruiting and retaining patients with mild-moderate PSCI in the intervention and investigate intervention-related efficacy.
Methods: Sixty-four stroke patients with mild-moderate PSCI will be recruited to this pilot randomised controlled trial (RCT) and will be randomly allocated to the intervention or control. The intervention comprises five weeks of group-based cognitive rehabilitation delivered by a clinical neuropsychologist, with tailored home activities. The primary outcome is cognitive function as measured by standardised neuropsychological assessments prior to and following the rehabilitation (or control) period and at four months post-intervention. Secondary outcomes include patient self-efficacy and carer psychological wellbeing.
Results: This study will provide robust evidence, and estimated effect sizes, to inform a decision to progress to a definitive trial, including recruitment and retention rates, feasibility of randomisation, patient acceptability, and resource use based on micro-costing.
Conclusions: A definitive trial has substantial potential to progress the national and international evidence-bases in relation to post-stroke cognitive rehabilitation, with the ultimate potential to improve outcomes for stroke survivors and their families.
Disclosure of interest: No

2667

Optimal Blood Pressure For The Prevention Of Major Vascular Events In Stroke Patients (Optimal- Stroke)

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Background and aims: Despite the evidence suggesting the use of antihypertensives in patients with ischemic stroke (IS), the heterogeneity of the clinical trials included in guidelines compromises the recommendation of a blood pressure (BP) target and the intensity of the BP reduction required. **Objective-** The primary objective of the OPTIMAL-Stroke trial is to determine if a more intensive BP control target compared to the standard BP target in a population of patients with previous IS has an impact on the reduction of major cardiovascular events.
Methods: OPTIMAL-Stroke is a randomized, controlled, 1:1 open-label clinical trial with blind assessment of clinical outcomes. Population-Patients are eligible to the study if they are over 18 years and have a history of IS or transient ischemic attack, clinically stable for at least 48 hours prior to study inclusion and have a systolic blood pressure of 130-180 mmHg. Sample Size-4060 patients.
Results: Intervention: Patients were randomized to either an intensive BP control group targeting SBP $<$120 mmHg or to a control group, targeting SBP $<$140 mmHg. Outcome-The primary outcome is the first occurrence of a composite outcome of major cardiovascular events (cardiovascular death, non-fatal myocardial infarction (MI), non-fatal stroke, hospitalization for unstable angina or hospitalization for heart failure). Statistical Analysis-The analysis of primary efficacy outcome will be the comparison between the two groups using a long-rank test procedure.
Conclusions: Trial Status- Enrollment is finished at 30 sites. A total of 4368 patients were randomized and are currently being followed.
Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

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EXTRA-INTRACRANIAL ANASTOMOSIS IN THE ACUTE PHASE OF STROKE

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Background and aims: Implantation of an extra-intracranial anastomosis (ECIC) between the temporal artery and the middle cerebral artery is an option for treatment of cerebral hypoperfusion in case of chronic occlusion of the internal carotid artery or the middle cerebral artery. The operation is normally performed after a thorough examination as planned. Data from larger studies are not yet available on treatment in the acute stage of pressure-dependent patients.
Methods: Patients with acute ischemic stroke (AIS) treated with ECIC anastomosis in the acute stage between 2020 and 2022 were included in the retrospective analysis. The indication criterion was lateral asymmetry of blood flow in the basin of the middle cerebral artery and dependence of clinical status on blood pressure levels. Clinical outcome at 3 months was assessed using the modified Rankin scale (mRS).
Results: A total of 16 patients (13 men, 59$\pm$11 years) were included in the analysis. The median interval between surgery and AIS was 2 days. 44% of patients were already in good clinical condition (mRS$\leqslant$2) at discharge. After rehabilitation within 3 months of AIS, 69 % of patients achieve a good clinical condition. Within one year from AIS, we expect a good clinical finding in 75-81% of patients. Two patients died months after the operation 12.5%.
Conclusions: ECIC anastomosis implantation as an acute AIS therapy for internal carotid or medial artery occlusion can be clinically very beneficial. The condition is the exhaustion of standard therapeutic procedures and a rational indication of the operation.
Disclosure of interest: No

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ENDOVASCULAR THERAPY FOR ACUTE ISCHEMIC STROKE ASSOCIATED WITH ISOLATED CERVICAL INTERNAL CAROTID ARTERY OCCLUSION IN LATE TIME WINDOW

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Background and aims: Mechanical thrombectomy (MTE) has proven effective in acute ischemic stroke (AIS) patients with intracranial occlusions; however, its role for AIS attributable to isolated cervical internal carotid artery occlusion (CICAO) without intracranial target remains unclear. We aimed to evaluate the outcomes of CICAO patients after MTE in the 6-24-hour time window.

Methods: We retrospectively analyzed data from prospectively captured databases of AIS patients with anterior large-vessel occlusion undergoing MTE within 6-24-hour between April 2020 and May 2021. All patients met the DAWN/DEFUSE-3 mismatch criteria. CICAO was defined as a complete occlusion of ICA-C without ipsilateral intracranial occlusion as observed on CTA and confirmed by DSA. Favorable outcome was defined as modified Rankin scale 0-2 at 90-days.

Results: Of 188 patients were included, 39 presented with CICAO, 149 had intracranial occlusions. There were no significant differences between two groups in age (63.5 vs. 62.8, P=0.716), baseline NIHSS (14 vs. 13, P=0.551), and onset-to-groin time (15.3 vs. 14.3 hour, P=0.223). The CICAO group had significantly smaller infarct volume (2[1-12] vs. 9[2-22], P=0.001), larger Tmax>6s (151[93-199] vs. 96[65-140], P<0.001) and mismatch volume (141[88-199] vs. 78[48.5 vs.123.5], P<0.001). Favorable outcome at 90-days was seen in 53.8% of CICAO group compared with 48.3% of intracranial occlusion group (P=0.54). No differences were observed in rate of symptomatic intracranial hemorrhage (2.6% vs. 2.7%, P=0.96), and mortality (10.3% vs 10.7%, P=0.93).

Conclusions: Extended window thrombectomy for AIS related to CICAO might be safe and effective as compared to intracranial occlusion in patients with target mismatch profile.

Disclosure of interest: No

1169

STROKE METRICS DURING THE FIRST YEAR OF THE COVID-19 PANDEMIC: A TALE OF TWO COMPREHENSIVE STROKE CENTERS FROM UNITED STATES AND CANADA

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Background and aims: Decline in ischemic stroke (IS) admissions was widely reported during SARS-CoV-2 pandemic. However, detailed analyses of the impact on stroke metrics are lacking. We sought to analyze changes in stroke presentation and in-hospital systems of care during the first year of pandemic at two Comprehensive Stroke Centers (CSCs): Calgary Stroke Program, Canada; and Massachusetts General Hospital, United States (US).

Methods: This study was based on IS admissions during 4 periods: Prepandemic, Wave 1, Lull, and Wave 2. Monthly intravenous thrombolysis (IVT) and endovascular therapy (EVT) rates and workflow times were compared between pandemic and prepandemic periods. Analyses were adjusted for age, sex, comorbidities, and pre-morbid care needs.

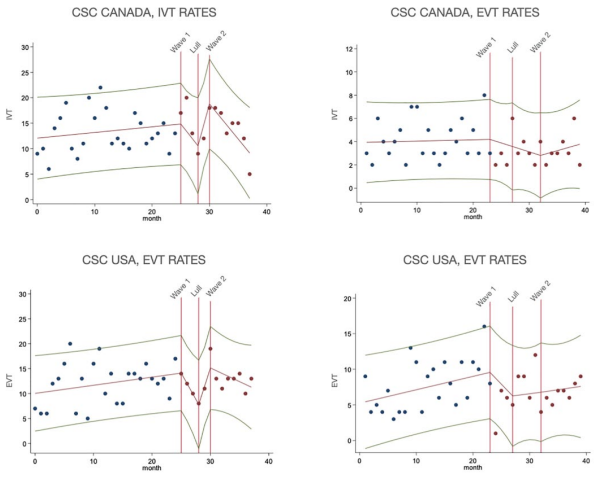
Results: There was a significant decrease in IS admissions during Wave 1 in both CSCs (Canada: β = -3.14, $p < 0.01$; US: β = -6.39, $p < 0.001$). IVT and EVT rates decreased in both sites during Wave 1, slowly catching up during the Lull, but never to prepandemic numbers, and dropping again in Wave 2 (Figure 1). Canada CSC experienced delays of EVT workflow during Wave 2 and Lull. US CSC had prolonged times for door-to-needle during Waves 1 and 2, CT-to-groin during Wave 1 and groin-puncture-to-reperfusion during Wave 2. Even during the Lull, both sites experienced significant delays of in-hospital workflows (Table 1).

Conclusions: Our results highlight the need for proactive strategies to reduce barriers to workflow and hospital avoidance for stroke patients during pandemics or other crisis periods.

Table 1. Pre-hospital and in-hospital workflow of ischemic stroke patients who received acute therapies before and during the first year of the COVID-19 pandemic in two comprehensive stroke centers

CSC CANADA				
Characteristic	**Prepandemic** Jan 1, 2018 - Feb 27, 2020	**Wave 1** Feb 28, 2020 - May 11, 2020	**Lull** May 12, 2020 - July 20, 2020	**Wave 2** July 21, 2020 - Feb 15, 2021
IS presenting or hospitalized	2645	207	248	716
IVT/EVT recipients	498	49	49	146
Pre- and in-hospital response and workflow, adjusted difference, minutes (95%CI)				
Onset-to-door time	Reference	-4.8 (-38.9-29.3)	15.5 (-18.1-49.1)	3.2 (-17.9-24.4)
Door-to-CT time	Reference	1.8 (-0.7-4.2)	**3.7 (1.3-6.1)**	0.2 (-1.3-1.7)
Door-to-needle time (IVT)	38 (27-64.5)	38 (26-54)	39 (34-55)	38 (30-52)
CT-to-groin-puncture time (EVT)	Reference	-3.2 (-13.9-7.5)	8.7 (-0.7-18.1)	**7.3 (1.2-13.5)**
Door-to-groin-puncture time (EVT)	Reference	1.1 (-13.1-15.2)	**15.3 (2.7-28.0)**	**8.5 (0.1-16.8)**
Groin-puncture-to-reperfusion time (EVT)	Reference	2.4 (-8.2-13.0)	**24.4 (16.2-32.6)**	**6.8 (0.6-13.0)**
Door-to-reperfusion time (EVT)	Reference	9.6 (-17.0-36.1)	**48.7 (28.2-69.3)**	**17.3 (1.8-32.9)**
CSC USA				
Characteristic	**Prepandemic** Mar 1,2018 - Mar 1,2020	**Wave 1** Mar 2, 2020 - May 26,2020	**Lull** May 27, 2020 - Oct 21,2020	**Wave 2** Oct 22,2020 - May 18,2021
IS presenting or hospitalized	1587	141	294	378
IVT/EVT recipients	280	25	61	71
Pre- and in-hospital response and workflow, adjusted difference, minutes (95%CI)				
Onset-to-door time	Reference	34.6 (-31.4-116.8)	-3.9 (-36.1-37.8)	-13.2 (-50.5-11.4)
Door-to-CT time	Reference	-6.4 (-21.8-9.3)	**24.3 (3.4-43)**	3.5 (-16.7-23.2)
Door-to-needle time (IVT)	Reference	**16 (1.0-34.3)**	12.3 (-0.3-49.7)	**13 (1.9-36.4)**
CT-to-groin-puncture time (EVT)	Reference	**8.9 (3.2-16.1)**	-7.1 (-26.7-12.6)	11.3 (-0.6-26)
Door-to-groin-puncture time (EVT)	Reference	17.7 (-29.1-77.2)	-8.20 (-37.8-20.4)	11.9 (-20.9-31.9)
Groin-puncture-to-reperfusion time (EVT)	Reference	6.5 (-0.6-12.2)	**11.9 (3.5-17.6)**	**24.1 (12.9-30.9)**
Door-to-reperfusion time (EVT)	Reference	-17 (-34.6-23.7)	4.5 (-19.7-46.4)	12.6 (-8.0-36.4)

Figure 1. Interrupted time series analyses of IVT and EVT monthly rates in two CSC



Disclosure of interest: No

HYPERACUTE MANAGEMENT – EXCLUDING CLINICAL TRIAL RESULTS

1502

Comparison of two blood pressure management protocols after complete recanalization (eTICI 2c-3)

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Background and aims: There is currently no defined consensus on optimal blood pressure management in the first 24h after complete recanalization (eTICI 2c-3).
To compare the clinical and neuroimaging outcomes of two blood pressure management protocols after complete recanalization: conservative treatment (SBT<185 mm Hg) vs. active treatment (SBT<150 mm Hg).
Methods: Retrospective analysis of a prospective database of patients with intracranial carotid artery or middle cerebral artery occlusion undergoing thrombectomy with complete recanalization.
The comparison of clinical and neuroimaging results was performed in two study periods: conservative treatment (March 2017 to March 2020) vs active treatment (April 2020 to September 2022).
Results: 107 patients (conservative treatment) and 125 patients (active treatment) met the inclusion criteria. At baseline, the active treatment group had a higher rate of patients with a modified Rankin scale >2 (2.8% vs 17.6%, p=0.001), higher baseline blood glucose (122 vs 134 mg/dl, p=0.042) and shorter onset-recanalization time (228 vs 210 minutes, p=0.041); with no significant differences in demographic variables, vascular risk factors, clinical severity, or neuroimaging tests. In the multivariate analysis, the active treatment group had a smaller infarct size (p=0.045) with a lower rate of cerebral edema (p=0.019) in the control CT at 24h and lower neurological-related mortality rate (p=0.001).
Conclusions: The active treatment protocol (SBT<150) after complete recanalization (eTICI 2c-3) reduced the infarct size, the development of cerebral edema and the neurological-related mortality rate.
Disclosure of interest: No

1521

Nitric oxide donors (nitrates) or substrate for acute stroke: an updated systematic review and meta-analysis

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Background and aims: Nitric oxide (NO) is a candidate treatment for acute stroke with effects including lowering blood pressure (BP), promoting reperfusion and cytoprotection.
Methods: We updated a Cochrane systematic review of published randomised controlled trials assessing NO donors or substrate versus control in people within one week of presumed stroke. We independently applied the inclusion criteria, assessed trial quality and extracted data, as per previous versions of this meta-analysis. Data were analysed using the Cochrane Collaboration Review Manager software and results calculated as mean difference (MD) or odds ratio (OR) with 95% confidence intervals (CI).
Results: Seven completed trials (5,365 participants) were identified and all tested transdermal glyceryl trinitrate (GTN), a NO donor. One small trial is ongoing. Overall, GTN did not reduce death or dependency at day 90 (OR 1.00; 95% CI 0.89-1.11) and this did not differ by stroke type, time to randomisation or baseline BP. Treatment with GTN did not alter death (OR 1.25; 95% CI 0.90-1.75), disability (MD -0.23; 95% CI -3.95 to 3.49) or quality of life (MD 0.00; 95% CI -0.07 to 0.08). Systolic/diastolic BP was significantly lower with GTN, MD -6.95 (95% CI -8.16 to -5.73) / -3.08 (95% CI -3.92 to -2.23) mmHg respectively. In contrast, heart rate (MD 2.13; 95% 1.26 to 3.00) bpm was higher and headache more common (OR 1.98; 95% CI 1.26-3.09) with GTN.
Conclusions: In people with acute stroke, GTN reduced BP and increased heart rate and headache but did not affect clinical outcome.
Disclosure of interest: No

1647

IMPROVING CARE IN INTRACEREBRAL HAEMORRHAGE (ICH) MAY SIGNIFICANTLY IMPACT MORTALITY - REPORTING ADHERENCE TO THE ABC BUNDLE AT AN ACUTE STROKE CENTRE IN ENGLAND

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Background and aims: The 'ABC' care bundle, developed and implemented at Salford, England reduced their 30-day mortality by 1/3. The ABC-ICH care bundle consists of:
Rapid reversal of **A**nticoagulation (Door-to-needle time <90 mins)
Intensive Blood pressure (**B**P) lowering (Needle to target of <140 systolic BP <60 mins).
C are pathway for prompt neurosurgical referral for patients with good premorbid function.
Targeting ICH care may have a disproportionately positive impact upon all stroke mortality.
Methods: Patients entered onto the Sentinel Stroke National Audit Programme (SSNAP) coded as ICH for the financial year 2021-2022 at EKHUFT were reviewed for adherence of two (A,B) of the ABC-ICH bundle.
116 patients were admitted during the study period with 16 excluded due to insufficient data and incorrect coding. A retrospective analysis was undertaken.
Results: All 13 patients on anticoagulation were reversed but none within the stipulated time frame and all eligible patients were commenced on appropriate anti-hypertensive therapy but target BP was achieved only in 34%.
Our 30-day inpatient mortality was 18% with the average length of stay of 18 days. Results highlighted shortcomings in speed of intervention despite favorable outcomes.
Conclusions: National SSNAP data (Dec 2017-Sep 2019) showed only 35% and 46% eligible patients received BP lowering treatment and anticoagulation reversal respectively which highlights the urgent need for improvements in ICH care in England.
Although our patients did receive appropriate therapy but not in a timely manner. Extrapolating findings from Salford, implementation of this bundle may potentially save 924 lives/year across England.
Disclosure of interest: No

1661

Basilar Artery Occlusion Management: an international survey of gender influence on management

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Background and aims: The superiority of endovascular thrombectomy (EVT) over medical management was not established in two early basilar artery occlusion (BAO) randomized controlled trials (RCT). Despite this, many physicians recommended EVT for acute BAO under certain circumstances. This work aimed to compare physicians' diagnostic and management strategies of BAO according to their gender.

Methods: From January to March 2022 an international survey on acute BAO management was conducted to examine clinical and imaging parameters influencing patient selection.

Results: Among the 1,245 respondents from 73 countries, 311 (25.0%) identified as female. 13.6% of interventionists identified as female. Geographically, female respondents were lowest in Asia (14.5%) and North America (23.9%).

Female respondents were more likely to choose time of onset as time of first estimated stroke like symptom (48.0% vs. 38.5%, $p<0.01$), were less likely to favor thrombectomy in the V4 segment of vertebrobasilar artery occlusions (31.5% vs 43.3%, $p<0.01$), and were less likely to find it acceptable to enroll all patients who met trial criteria in the standard medical treatment arm of a clinical trial (41.2% vs. 47.0%, p=0.01). Male respondents were more likely to agree that thrombolysis would not alter their decision on proceeding with EVT (93.7% vs 88.3%, $p<0.01$).

Conclusions: Female clinicians appear to be significantly underrepresented in stroke medicine. This is most pronounced amongst interventionists and in Asia. Differences in opinion on BAO management were observed between the genders in a number of significant areas.

Disclosure of interest: No

2101

Basilar artery occlusion management: Insights on European Clinicians' perspectives from the After the BEST of BASICS (ABBA) study

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Background and aims: The superiority of endovascular thrombectomy (EVT) over standard medical treatment (SMT) was not established in early basilar artery occlusion (BAO) randomized controlled trials (RCTs). Despite this, many clinicians recommended EVT in certain circumstances, before publication of positive RCTs.
Methods: Data from the ABBA survey was analysed comparing European clinicians' approach to EVT in cases of BAO versus the rest of the world.
Results: European clinicians contributed 493 (39.6%) of the 1245 respondents. There was widespread agreement that, in certain circumstances, EVT was superior to SMT in BAO and that the BEST and BASICS results had not altered management.
European respondents were less likely to support further RCTs (75.6% vs 83.9%) and more likely to report they would be unhappy to enroll in the SMT arm of a future RCT (35.0% vs 23.2%).
European respondents were more likely to favor not using a pcASPECTS (45.4% vs 38.41%), or a NIHSS cut off (50.0% vs 37.9%) to aid selection. If they felt advanced imaging was required, European respondents were more likely to choose MR imaging (64.5% vs. 52.4%). European respondents were more likely to favor EVT in cases of isolated P1 occlusions (69.2% vs. 60.6%), but less likely to favor EVT in V4 occlusions (37.0% vs. 42.5%).
Conclusions: Our results suggest a difference in approach to selection for EVT in BAO cases amongst European respondents. The effect of these differences on clinical decision making has the potential to contribute to further studies on areas of uncertainty in BAO management.
Disclosure of interest: No

2158

Carotid atherosclerosis is associated with poor functional outcome in patients treated with intravenous thrombolysis and mechanical thrombectomy for aute ischaemic stroke

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Background and aims: Carotid artery atherosclerosis is a well established risk factor for ischaemic stroke. Therefore carotid endarterectomy and angioplasty and stenting are the treatment of choice in stroke prevention. Little is known about the influence of carotid atherosclerosis on the outcome of patients treated with reperfusion therapies (intravenous thrombolysis and mechanical thrombectomy) for acute ischaemic stroke.
Methods: We have included 148 consecutive patients treated with intravenous thrombolysis and 102 treated with mechanical thrombectomy. All patients underwent carotid ultrasound in the course of the disease.
Results: Atherosclerotic nonstenotic insignificantly decreased the probability of Barthel Index of 95 (OR 0.54; 95%CI 0.27-1.08, p=0.080). Ipsilateral stenosis of ⩾50% reduced the likelihood of Barthel Index of 95 (OR 0.39; 95%CI 0.18-0.88, p=0.022) and 0.23-fold (OR 0.23; 95%CI 0.10-0.91, p=0.031). The likelihood of mild stroke was reduced (OR 0.16; 95%CI 0.04-0.63, p=0.007) while that of moderate stroke increased (OR 7.05; 95%CI 1.58-31.53, p=0.009).
A multivariate analysis of the whole study group including age, sex, the size of infarction focus, NIHSS score at admission, arterial hypertension, atrial fibrillation, diabetes and hyperlipidemia revealed that ⩾50% stenosis continued to decrease the likelihood of Barthel Index of 95 (OR=0.25, 95%CI 0.06-0.97, p=0.042).
Conclusions: Carotid stenosis is associated with worse prognosis after reperfusion therapies for stroke. Angio CT aiming at assessment of carotid stenosis should be considered in patients qualified for reperfusion therapies to help stratify their outcome.
Disclosure of interest: No

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Dual antiplatelet therapy in the acute phase of lacunar stroke doesn't seem to prevent early neurological deterioration

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Background and aims: Early neurological deterioration (END) can occur in approximately 20-30% of lacunar strokes. Several clinical and imaging data have been reported as potential predictors of progression. The aim of our work is to evaluate if dual anti-platelet treatment (DAPT) in the acute phase of the lacunar stroke has some impact in END. Other factors described in the literature as being associated with END were also evaluated, as well as the impact of END in the functional outcome.
Methods: A retrospective observational cohort study in patients with lacunar strokes based on a single-stroke-center hospital database was performed. DAPT in the hyperacute (started after CT scan in the emergency department) and acute phase (24h after thrombolysis) were obtained from medical reports as well as various clinical and analytical parameters.
Results: In 142 patients that met our inclusion criteria, 31 had END (~22%). In a total of 79 patients that started DAPT in the hyperacute phase 19 had END (~24%). In a total of 45 patients that started DAPT 24h after thrombolysis, 11 had END (~24%). No significant statistical association was found between those who underwent DAPT in the hyperacute and acute phase and the occurrence of END (p-value = 0,47 and 0,61 respectably). END was significantly associated with a modified Rankin score >2 at 3 months (p-value=0,000).
Conclusions: Our results did not confirm a potential positive effect of DAPT in the acute phase in preventing progressive lacunar strokes. Multi-stroke center studies are needed to improve the management of these patients
Disclosure of interest: No

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ACCEPTABILITY OF ADVANCE CONSENT TO PHYSICIANS AND ETHICS CHAIRS IN CANADA

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Background and aims: Obtaining informed consent for participation in acute stroke clinical trials is recognized as a major challenge around the world. Advance consent presents a potential solution to this issue by allowing individuals at high risk of stroke to provide consent before becoming eligible for enrollment. Because this approach has not previously been trialed, we sought to determine its acceptability to relevant stakeholders: stroke clinic physicians and research ethics board chairs
Methods: Specific online surveys were distributed to Canadian stroke physicians and Canadian REB chairs. Questions focused on the acceptability of advance consent. Data were analyzed descriptively.
Results: Of 50 physician-respondents, 82% expressed comfort with obtaining advance consent in a stroke clinic environment, and 92% felt that doing so would not be a significant disruption to clinic workflow. Of 15 REB chairs that regularly review stroke trials, 60% expressed comfort approving a stroke study using advance consent. A plurality (40%) of REB chairs would prefer a protocol using advance consent over one using deferral of consent, and another 40% were expressed no preference. Finally, more respondents were likely to approve trial-specific advance consent (40%) than broad advance consent (33%).
Conclusions: Canadian stroke physicians and REB chairs are generally supportive of advance consent for participation in acute stroke trials. Focus groups with stroke patients and surrogates are underway. These data will be used to design a model of advance consent to be tested in the clinical environment.
Disclosure of interest: Yes

THROMBOLYSIS – EXCLUDING CLINICAL TRIAL RESULTS

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SAFETY OF REPERFUSION THERAPIES IN PATIENTS WITH ACUTE ISCHEMIC STROKE AND INCIDENTALINTRACRANIAL ANEURYSMS: A RETROSPECTIVE STUDY

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Background and aims: Unruptured intracranial aneurysms (UIAs) represent a relative contraindication for intravenous thrombolysis (IVT) in acute ischemic stroke (AIS). However, presently few data on the risk of UIA rupture secondary to IVT are reported. Our retrospective study aimed to assess whether IVT for AIS is associated with UIA rupture and intracranial hemorrhages (ICHs) in patients with unruptured UIAs.
Methods: We conducted a retrospective, single-center observational study and included patients admitted to the Perugia Stroke Unit from January 2019 to December 2021. Patient inclusion criteria were an AIS, regardless of its location, and IVT treatment group of cases consisted of patients with UIAs at the time of the AIS, while the controls had no UIAs.
Results: A total of 238 patients were collected: median age 76 yy (IQR 17), 102 F and 136 M 133/223 patients received IVT alone. 119 with no UIA, 14 with UIA. Among patients with IVT, 52/192 patients with no history of UIAs experienced ICHs, while 1/19 patients with UIAs experienced any ICH (OR 0.15, CI 95% 0.02-1.15, p=0.070). No significant differences in patient comorbidities were observed between patients with UIA or UIA treated with IVT. Admission NIHSS was lower in patients with UIA than those without UIA (9.70±0.94 vs.12.79±0.43, p=0.016).
Conclusions: One patient with UIAs experienced ICH after IVT treatment, which appears to be safe in patients with AIS, including large UIAs (⩾10 mm).
Disclosure of interest: No

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INTRAVENOUS THROMBOLYSIS FOR MILD STROKE: NIHSS 3–5 VERSUS NIHSS 0–2

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Background and aims: We aimed to compare the safety and effectiveness of thrombolysis in mild stroke with NIHSS score of 0–2 vs. 3–5 and identify the predictors of a favorable functional outcome in a real world longitudinal registry.
Methods: In a prospective thrombolysis registry, we identified patients with acute ischemic stroke who presented within 4.5 hours of symptom onset and had initial NIHSS scores ⩽ 5. Demographic data, medical history, pre–stroke medications, imaging data, and laboratory measures were collected. The outcome of interest was modified Rankin Scale score of 0 to 1 at discharge. Safety outcome was evaluated by syptomatic intracrerebral hemorrhage defined as any decline in neurologic status due to hemorrhage within 36 h.
Results: Of a total of 236 eligible patients, those with an admission NIHSS score of 0–2 (n=80) had a better functional outcome at discharge compared with NIHSS 3–5 group (n=156) (81.3% vs. 48.7%, adjusted odds ratio [aOR] 0.40, 95% confidential interval [CI] 0.17 – 0.94, P=0.04) without increasing the rate of symptomatic intracerebral hemorrhage and mortality. Non–disabling stroke (Model 1: aOR 0.06, 95%CI 0.01–0.50, P=0.01; Model 2: aOR 0.06, 95% CI 0.01–0.48, P=0.01) and prior statin therapy (Model 1: aOR 3.46, 95% CI 1.02–11.70, P=0.046; Model 2: aOR 3.30, 95% CI 0.96–11.30, P=0.06) were independent predictors of favorable outcomes.
Conclusions: Minor stroke severity, non–disabling stroke and prior statin therapy were independent predictors for functional outcomes at discharge.
Disclosure of interest: No

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MECHANICAL THROMBECTOMY WITH PRIOR BRIDGING INTRAVENOUS THROMBOLYSIS THERAPY COMPARED TO DIRECT MECHANICAL THROMBECTOMY AT A REFERENCE CENTRE

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Background and aims: Practice guidelines recommend intravenous thrombolysis (IVT) and mechanical thrombectomy (MT) as standard therapy in candidate patients with large vessel occlusion (LVO). IVT is in question, as it could imply less safety, therapeutic delay and added cost. The aim of the study was to compare standard treatment vs. direct TM in our population.
Methods: Retrospective observational analysis of patients with acute ischemic stroke due to LVO with =<4.5 hours onset treated with MT from May 2016 to June 2022. In the absence of contraindications, r-TPA was administered. Demographic, clinical, radiological and prognostic data were collected.

Results: 252 patients analyzed, 139 (55%) treated by standard therapy and 113 (45%) by direct MT. There were non-significant differences in age or sex between groups. The direct MT group presented more comorbidities (Atrial Fibrillation and *Diabetes Mellitus*) and previous disability (modified Rankin Scale [mRS]=0: 84.2% vs 68.5%; p=0.0142). NIHSS and baseline ASPECTS were similar. Successful recanalization was achieved in 95.6% of all patients. The direct MT group had higher in-hospital mortality (12.9% vs 23.9%; p=0.0241) and disability at 90 days (mRS⩽2: 34.4% vs 61.4%; p=0.0004), with no significant differences in intracranial hemorrhage.
Conclusions: Despite a similar proportion of successful recanalization and major complications in both groups, patients treated with direct MT had higher in-hospital mortality and worse quality of life prognosis. These results should be interpreted with caution, given the difference in baseline characteristics and comorbidities between groups. Further studies would be necessary to corroborate these results by homogenizing populations.
Disclosure of interest: No

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Combined prognostic significance of red blood cell distribution width (RDW) and inflammatory biomarkers in in-hospital outcomes of acute ischemic stroke(AIS) patients undergoing intravenous thrombolysis

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Background and aims: We aimed to investigate the combined effect of RDW and inflammatory biomarkers on in-hospital outcomes of acute ischemic stroke (AIS) patients with thrombolysis.
Methods: A total of 417 AIS patients with thrombolysis were retrospectively included. The participants were divided into four groups according to the cut-off of inflammatory biomarkers [white blood cell (WBC) or C reactive protein(CRP)] and RDW by receiver operating characteristic (ROC) curve: LWLR(low WBC and low RDW), LWHR(low WBC and high RDW), HWLR(high WBC and low RDW), and HWHR(high WBC and high RDW); or LCLR(low CRP and low RDW), LCHR(low CRP and high RDW), HCLR(high CRP and low RDW), and HCHR(high CRP and high RDW), respectively. Logistic regression models were used to compute the odds ratios (ORs) and 95% confidence intervals (CIs) of in-hospital pneumonia and functional outcome across the four subgroups.
Results: The risk of in-hospital pneumonia was significantly higher in HWHR and HCHR groups compared with that in LWLR and LCLR groups (OR 12.16, 6.93; all $P < 0.001$). Patients in HWHR and HCHR groups were 9.31 or 3.38 fold more likely to have poor functional outcomes, compared with those in LWLR and LCLR groups. Simultaneously adding RDW and WBC or CRP to the basic model with established risk factors significantly improved risk discrimination and reclassification for pneumonia and functional outcome, shown by increase in C-statistics, net reclassification improvement and integrated discrimination improvement(all $P<0.05$).
Conclusions: Combined RDW and inflammatory biomarkers within 4.5 hours better predicted in-hospital outcomes of thrombolytic patients.
Disclosure of interest: No

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The combined value of estimating Glomerular Filtration Rate and coagulation biomarkers in predicting in-hospital outcomes of acute ischemic stroke patients with thrombolysis

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Background and aims: We explored the combined value of eGFR and coagulation biomarkers on in-hospital outcomes of AIS patients with thrombolysis.
Methods: We enrolled 417 AIS patients with thrombolysis. According to the threshold value of coagulation biomarkers [D-dimer or fibrinogen(Fg)] and eGFR by receiver operating characteristic(ROC) curve, the participants were categorized into four groups: LFLG(low Fg and low eGFR), LFHG (low Fg and high eGFR), HFLG (high Fg and low eGFR) and HFHG (high Fg and high eGFR); or LDLG (low D-dimer and low eGFR), LDHG (low D-dimer and high eGFR), HDLG (high D-dimer and low eGFR), HDHG (high D-dimer and high eGFR). Logistic regression models were used to calculate the odds ratios (ORs) and 95% confidence intervals (CIs) of in-hospital pneumonia and functional outcome across the four groups.
Results: Patients with higher eGFR and coagulation biomarkers levels have the highest risk of in-hospital outcomes. Compared with LFLG patients, the ORs(95% CIs) of those in HFHG group were 3.00(1.07-8.44) and 4.02(1.63-9.91) for in-hospital pneumonia and functional outcome. The ORs (95% CIs) of those in HDHG group were 4.59(1.58-13.32) and 2.52(1.11-5.74) for in-hospital pneumonia and at-discharge functional outcome, compared with LDLG patients. Simultaneously adding eGFR and Fg or D-dimer to the basic model with established risk factors significantly improved risk discrimination and reclassification for pneumonia and functional outcome, shown by increase in C-statistics, net reclassification improvement and integrated discrimination improvement(all $P<0.05$).
Conclusions: Combined eGFR and coagulation biomarkers within 4.5h showed a better predictive power for in-hospital outcomes of thrombolytic patients.
Disclosure of interest: No

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A new clinical score to predict the possibility of stroke patients receiving intravenous thrombolysis

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Background and aims: We aimed to develop and validate a clinical score to identify the factors which contribute to variation in, and influence clinician's decision-making about treating acute ischemic stroke (AIS) patients with Intravenous thrombolysis (IVT).
Methods: We retrospectively included consecutive AIS patients within 4.5 hours after onset in the emergency department (ED), who were admitted to a comprehensive stroke center in Jiangsu province, China. The patients were randomly divided into derivation (60%) and validation data sets (40%) to develop and validate the clinical score. Multivariable stepwise forward logistic regression was performed to identify the independent predictors of IVT offering in the derivation data.
Results: Out of 526 included patients, 418 patients received thrombolytic therapy. Nine factors were associated with the likelihood of thrombolysis (age, time to hospital, NIHSS score, great vessel, facial paralysis, dizziness, headache, history of stroke, and neutrophil ratio). The c-statistics of the Intravenous Thrombolysis Score in the derivation cohort (n= 316) and validation cohort (n=210) were 0.795 and 0.751, respectively. The performance of the scoring model was validated with a calibration plot showing good predictive accuracy for the scores in the derivation data (calibrated $P = 0.861$) and validation data (calibrated $P = 0.876$).
Conclusions: The Intravenous Thrombolysis Score for predicting the possibility of offering IVT to AIS patients indicates that clinicians differ in their thresholds for the treatment across a number of patient-related factors, which will be linked to training professional development

programmes and address the impact of non-medical influences on decision-making using evidence-based strategies.
Disclosure of interest: No

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One year of Eye Stroke Code: Time is vision

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Background and aims: Central retinal artery occlusion (CRAO) is a form of stroke associated with poor visual recovery. Intravenous thrombolysis is emerging as a compelling therapeutic approach. There is a dilemma regarding the appropriate treatment, as formal protocols are lacking. Our objective is to assess the effectiveness of an "Eye Stroke Protocol" in a comprehensive stroke center during 2022.
Methods: A protocol was set up with Ophthalmology and Neurology. An observational study with retrospective analysis was set up to analyze patients with "Eye Stroke Code" and CRAO confirmed in the Emergency Department (12 hours since the onset) during 2022. When indicated, rtPA was administered by neurologists (0.9 mg/kg, 4.5h time window). Main outcome was improvement of visual acuity (VA) at 90 days.
Results: A total of 13 patients (mean age 72, 61.5% female) were assessed within the first 12h after visual loss. Thrombolysis was administered in 6 patients (46%) without bleeding. In 7 patients (54%), rtPa could not be administered (time window was the main reason in 6 patients). Optical coherence tomography (OCT) was used to treat 1 patient with unknown onset. Atherothrombotic (46.1%) was the most common cause, followed by cardioembolic etiology (23%). In 4 patients (30.7%), the etiology remained undetermined. Improvement of VA was more frequent in rTPa patients (50% vs 14.2%, $p < 0.055$).
Conclusions: Thrombolysis was beneficial compared with the non-rtPa group. "Eye stroke Code" protocols must include an ophthalmologic evaluation to confirm diagnosis and a neurologist to guide rtPA administration and complete etiological study
Disclosure of interest: No

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PROTEIN ENGINEERING OF STAPHYLOKINASE WITH IMPROVED THROMBOLYSIS

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Background and aims: Staphylokinase is a readily available bacterial protein that activates plasminogen in a fibrin-specific manner using another molecule of activated plasmin. The immunogenicity of staphylokinase can be lowered 300-fold by three mutations and its clinical effectivity and safety are noninferior to alteplase. Based on our recent results, the effectivity of staphylokinase can be improved by three orders of magnitude by increasing binding affinity to plasmin.
Methods: The structural model of staphylokinase in complex with microplasmins was used for computational mutagenesis using the web tool AffiLib. We have evaluated mutants' binding score, and thermostability using Rosetta ddg_monomer. Selected mutants were produced in *E. coli*, purified, and tested regarding their plasminogen activation efficacy using the fluorogenic substrate method, plasminogen and plasmin binding using surface plasmon resonance, and fibrinolytic efficacy using the fibrin plate method and clots from healthy donors' blood.
Results: Using computational modelling, we have constructed four mutants, including a four-point mutant SAK01, which binds plasmin with sixfold higher affinity and nine times higher selectivity than wild-type staphylokinase. SAK01 posseses slightly higher fibrinolytic effectivity. SAK01 serves as a proof-of-concept mutant for further mutagenesis. We will discuss the four created mutants' affinity, selectivity, speed of plasminogen activation, and fibrinolysis.
Conclusions: We confirmed that it is possible to improve the affinity of staphylokinase to plasmin by computational design in this study. In further research, we will produce additional mutants using AffiLib, adaptively steered molecular dynamics simulations affinity prediction, ribosomal display, and machine learning, to further increase the effectivity of staphylokinase.
Disclosure of interest: No

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COMBINATION IS BETTER: FINAL INFARCTION VOLUME AFTER FULL REVASCULARIZATION IN EARLY ARRIVAL LVOS

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Background and aims: Successful reperfusion and final infarction volume (FIV) are associated with 90-day functional outcomes after large vessel occlusion (LVO) stroke. This study aims to investigate the potential benefit of intravenous-thrombolysis (IVTPA) on reducing the final infarction volume (FIV) after successful mechanical thrombectomy (MER) and subsequent better functional outcomes.
Methods: This is a retrospective cohort obtained from Get with the guidelines stroke (GWGS) database available at the Medical University of South Carolina Comprehensive Stroke Center (CSC), USA for LVO patients who presented within 4.5 hours of last-known-well (LKW) between January/2018- June/2022. FIV was measured using 1.5-tesla axial brain-MRI DWI sequences or axial-brain-CT after successful MER with modified thrombolysis score (mTICI2c-3).
Results: Of 101 LVO patients who arrived within 4.5h of LKW and achieved (mTICI2c-3), 40 (39.6%) patients received combination therapy (TP-MER). TP-MER patients had shorter LKW to CSC arrival p=<0.001 and shorter LKW to groin puncture p=0.002, no other differences in patients' baseline characteristics, baseline images characteristics, LVO location or revascularization times compared to MER-only patients. TP-MER patients had smaller FIV (7cc IQR [2.2-24.7] vs.15.95cc IQR [4.9-98.8]), p=0.04. IVTPA was associated with a 26% reduction in the final infarction volume aOR 2.1,95%CI [0.169-0.172], p= 0.037. FIV was associated with discharge NIHSS aOR 3.095,95%CI [0.030-0.136], p= 0.003, and 90-day functional independence mRS (0-2) aOR 0.975 95%CI [0.955-0.997], p=0.023.
Conclusions: Combination therapy is associated with reduced final ischemic stroke burden in LVO patients with successful revascularization and subsequent improved outcomes. Decision to skip IV-thrombolysis for IVTPA-eligible patients before MER should be individualized.
Disclosure of interest: No

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Evaluating the Use of Intravenous Tenecteplase for the Management of Acute Ischemic Stroke in the Mobile Stroke Unit: An International Multi-Institutional Survey

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Background and aims: There is growing evidence supporting the use of Tenecteplase (TNK) as an alternative to alteplase (tPA) for acute ischemic stroke. TNK has been shown to be non-inferior with comparable safety and efficacy to tPA, and can be administered as a single intravenous bolus. Currently, there is no data on the use of TNK in mobile stroke units (MSUs) globally. The objective of this study is to characterize the utility of TNK in MSUs including dose, consent process, and factors affecting this transition.
Methods: A survey was distributed through Pre-Hospital Stroke Treatment Organizations (PRESTO) platform, an international consortium for institutions with MSUs and medical practitioners involved in pre-hospital stroke management.
Results: The response rate was 10/19 (52.6%) active MSU members of PRESTO. Of the 10 responders, 2 institutions are actively using TNK in their MSUs and 4 are transitioning by spring 2023. All reported using 0.25 mg/kg as the standard dosage. 1 institution obtained IRB approval as ongoing research trial, while 5 did not utilize consent forms regarding off-label use of TNK. The most common factors affecting the decision to transition to TNK were ease of use and scientific data supporting efficacy and safety.
Conclusions: Several MSUs have begun adopting TNK (0.25 mg/kg) as the agent of choice for acute stroke thrombolysis. The majority of MSUs using TNK are not enrolled in active ongoing clinical trials. Our results indicate that the decision to transition to TNK was influenced by its practical advantages and promising scientific data to date.
Disclosure of interest: No

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INTRAVENOUS THROMBOLYSIS IN ACUTE ISCHEMIC STROKE: EARLY RESULTS FROM THE NATIONAL STROKE PROGRAM IN ARMENIA

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Background and aims: In 2019 the Armenian Government established a National Stroke Program which funded intravenous thrombolysis (IV t-PA) for acute ischemic stroke at 3 comprehensive stroke centers (CSCs) in Yerevan. The aim of this Armenia Stroke Council study was to review the results of the acute stroke treatment provided at the 3 CSCs during 2021.
Methods: Data analysis from prospectively recorded databases at 3 CSCs. Patient demographics, medication history, time metrics, brain imaging, NIHSS and mRS scores before treatment and at discharge were recorded.
Results: A total of 581 patients (130 (53.1%) men, 115 (46.9%) women, mean age 68.4±10) were treated. Mean admission NIHSS was 7.9±4. The study group was comprised of 245 patients treated with IV t-PA only; The remaining 336 patients received endovascular therapy and included 47 treated with bridging therapy. 187/241 patients (77.6%) had mRS 0-2 at 3 months, and the 148/241 (61.2%) had a 4-point, or more, drop of the discharge NIHSS. Mortality at 3 months was 15/245 (6.1%). Symptomatic intracranial hemorrhage occurred in 5/245 patients (2.0%), and systemic hemorrhage occurred in 5/245 cases (2.0%). The mean door-to-needle time was 62.4 minutes, ranging between 52.4 to 84.8 minutes at different hospitals, and the <60-minute criterion was achieved in 50.7% of cases.
Conclusions: The analysis indicates that the cumulative performance of these hospitals was not inferior to European and American published standards. It also shows that there is room for improvement at all centers. However, the performance varied substantially among them.
Disclosure of interest: No

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Rescue intra-arterial thrombolysis to improve final TICI score after thrombectomy

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Background and aims: Endovascular thrombectomy is the standard treatment in selected patients with acute ischemic stroke and large vessel occlusion, but continuous improvement in angiographic and clinical outcome is still needed. Intra-arterial thrombolysis has been tested as a possible rescue tool in unsuccessful thrombectomy, or as an adjuvant therapy after the endovascular procedure, to pursue complete recanalization.
Methods: Here we present a case series analysis of intra-arterial Alteplase administration (5 mg bolus, repeated up to 15 mg if TICI ⩾2c is not achieved) in 15 consecutive anterior circulation stroke patients after unsuccessful thrombectomy, defined as TICI score ⩽2b after at least 3 passes or if unsuitable for further endovascular attempts, with the aim of improving recanalization.
Results: An improvement of final TICI score was achieved in 10/15 patients (66%). TICI ⩾2c was achieved after 5 mg iaTPA in 4 patients, and after 10 mg iaTPA in 5 cases (Fig.1). 6/15 patients received 15 mg iaTPA: 1/6 showed angiographical improvement. A major effect of intra-arterial Alteplase was observed for distally migrated emboli. None of the patients experienced any symptomatic hemorrhagic transformation or other major bleeding.
Conclusions: Our report shows, in a very small cohort, a high rate of final TICI score improvement, encouraging the development of randomized controlled trials of rescue intra-arterial thrombolysis in patients with suboptimal angiographic results after mechanical thrombectomy.
Disclosure of interest: No

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EFFECTIVENESS OF RECANALIZATION TREATMENTS IN MILD ACUTE ISCHEMIC STROKE WITH LARGE VESSEL OCCLUSION

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Background and aims: Large vessel occlusion (LVO) is present in around 20% of mild acute ischemic stroke (AIS) cases, but only limited data is available on the efficacy of mechanical thrombectomy (MT) in these scenarios. Our study investigated the effectiveness of different recanalization methods in mild AIS.
Methods: We enrolled patients with mild AIS (defined as NIHSS⩽5) who had LVO on the admission CT-angiography and received recanalization treatment (intravenous thrombolysis (IVT) and/or MT). Primary endpoint was the rate of good functional outcomes (defined as modified Rankin Scale 0-2 points) and mortality at 90 days. Secondary endpoints were early neurological deterioration (END) and development of symptomatic intracranial haemorrhage (SICH) within 72 hours.
Results: A total of 944 patients were screened, 284 (30.1%) of whom had mild symptoms. LVO was present in 56 (19.7%) of the mild AIS cases (median age: 64.5 years). Distribution of recanalization methods was: 30 IVT only (53.6%), 16 MT only (28.6%), 10 IVT and MT (17.8%). Proportions of good outcomes were 76.9% after IVT, 84.6% after MT and 44.4% after combined therapy. Mortality rates were 7.7%, 7.7% and 22.2% respectively. END could be observed in 10.0% after IVT, 12.5% after MT and in 50.0% of IVT+MT cases. SICH did not occur after IVT, but the rate was 25.0% for MT and 10.0% for combined therapy.
Conclusions: Our results reveal that IVT and MT can be effective methods to treat mild AIS patients, however higher rates of adverse events after combined therapy highlight the limitations.
Disclosure of interest: No

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Risk of symptomatic intracerebral hemorrhage following thrombolytic therapy in acute ischemic stroke and predictors of in-hospital mortality

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Background and aims: Patients with acute ischemic stroke (AIS) benefit functionally from recombinant tissue-plasminogen activator (rt-PA) therapy, symptomatic intracerebral hemorrhage (sICH) being considered one of the most frequent complication. The aim of this study was to identify the independent risk factors for sICH after rt-PA therapy and in-hospital mortality (IHM).
Methods: Retrospective study from a hospital based registry and medical records of the patients admitted to the Department of Neurology County Clinic Hospital Brasov. Over a course of a 36-month period starting in March 2019, 529 patients receiving rt-PA were enrolled in this study. To assess the determinants of IHM, univariate and multivariate regression analyses was carried out.
Results: The mean age was 69.36 ±19.4 years, 54.8% patients were males, the mean NIHSS score, 11.76 ± 8.2. From total of 529 patients, 96 (18%) died while they were admitted. Age >80 years (35 patients, 30.91%), hypertension (91 patients, 82,72%), diabetes mellitus (18 patients, 16,36%), congestive heart failure (19 patients, 17.27%), and chronic kidney disease (2 patients, 1.81%) were all identified as independent predictors of IHM by logistic regression. A number of 110 patients (20.79%) experienced sICH following rt-PA therapy, and 31 (28.12%) of them died, with similar independent predictors of poor outcome.
Conclusions: This study suggest that there are modifiable risk factors for sICH that could improve the outcome of ischemic stroke patients after thrombolytic therapy
Disclosure of interest: No

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Tenectplase versus Alteplase before thrombectomy: A comprehensive clinical and angiographic impact evaluation : Insight from ETIS registry

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Background and aims: Data on Tenecteplase versus Alteplase in the acute stroke management are scarce. Our objective was to have a comprehensive comparative assessment of angiographic and clinical outcomes in a large prospective observational study.
Methods: We included stroke patients who were eligible for intravenous thrombolysis and endovascular thrombectomy between 2019 and 2021, from an ongoing registry in twenty comprehensive stroke centers in France. We divided patients into two groups based on thrombolytic agent (Alteplase vs Tenecteplase). Then, we compared their treatement times, also their angiographic (TICI scale) and clinical (mRS at three months and sICH) outcomes after controlling for potential confounders using propensity score methods.
Results: We evaluated 1131 patients who had thrombectomy for the final analysis, 250 received Tenecteplase and 881 Alteplase. Both groups were of the same median age (75 vs 74 respectively), same baseline NIHSS score (16) and the same ASPECTS (8). There was no statistical difference for First Pass Effect (OR 0.93, 95% CI 0.76-1.14, p= 0.75) neither for reperfusion needed time (OR 0.03, 95% CI 0.09-0.16, p= 0.49), nor for the final reperfusion status. Clinically, the functional independence at 90 days was similar in both groups (OR 0.82, 95% CI 0.61-1.10, p= 0.18) with same risk of sICH (OR 1.36, 95% CI 0.77-2.41, p= 0.28). However, Tenecteplase patients had shorter imaging-to-groin puncture time (99 vs 142 minutes, $p<0.05$).
Conclusions: Tenecteplase showed no better clinical or angiographic impact for thrombectomy compared to Alteplase. Nevertheless, it seems superior to shorten thrombolysis-to-groin puncture time.
Disclosure of interest: No

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Evaluation of alteplase-induced thrombolysis in human vs rat plasma: an in vitro study

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Background and aims: Experimental stroke studies are important for development of more effective thrombolytics, but it is not clear if results obtained from rat plasma can be directly translated to humans. Therefore, *in vitro* thrombolysis model was used to compare alteplase-induced dose-response in human vs rat plasma.
Methods: Static *in vitro* model with semi-synthetic clots was used. Clot lysis was induced by alteplase at clinically relevant concentration (1.3 mg/L) and at concentrations 10-fold lower to 50-fold higher. Clots were incubated in human or rat plasma for 60 minutes at 37°C. Efficacy was assessed by clot mass loss and red blood cell release.
Results: Alteplase at clinically relevant concentration induced non-inferior effect in rat plasma compared to human plasma (27.9±5.1% vs 44.6±7.0%, diff. 16.7%, 95%CI -11.3-22.2%). In both plasmas, the efficacy of 0.13 mg/L alteplase was inferior to 1.3 mg/L (diff. 10.7%, 95%CI -5.2-16.2%). Whereas 1.3 mg/L was non-inferior to 13 mg/L (diff. 4.7%, 95%CI 0.8-10.2%), and similarly for further increase of alteplase to 65 mg/L.
Conclusions: Alteplase at clinically relevant concentration induced well-detectable clot lysis in both human and rat plasma, with non-inferior effect in rat plasma compared to human plasma. Further, changes in the efficacy as response to different concentrations of alteplase were similar in both plasmas. Such results indicate that the model with rat plasma is sufficiently sensitive, translatable, and thus suitable for screening of thrombolytics.
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Disclosure of interest: No

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SAFETY OF TENECTEPLASE VS ALTEPLASE IN STENT IMPLANTATION IN THE ACUTE ISCHEMIC STROKE

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Background and aims: The use of intravenous fibrinolysis in patients who required stenting in the acute phase of the stroke with antiplatelet agents could increase the risk of bleeding. The objective of our study is to compare the safety of the use of tenecteplase (TNK) vs alteplase (rTPA) prior to stent implantation.
Methods: Retrospective observational single-center study. We evaluated patients between January 2021 and October 2022 treated by mechanical thrombectomy and stenting in the acute phase. They were subdivided into 3 groups based on whether they received intravenous fibrinolysis with TNK, rTPA, or without fibrinolysis.
Results: 34 patients with a mean age of 67.31 years(SD 17.16), 40% women, were included. 33.3% (12/34) received TNK, 20%(6/34) TPA, and 46.67% (16/34) did not undergo fibrinolysis. The NIHSS mean prior to treatment was 13 and the ASPECTS mean 8, with no significant differences between the groups. In 29/30 a satisfactory recanalization was achieved with TICI⩾2b and in 19/34 an extracranial stent was placed. 3 patients treated with TNK and 1 with rTPA presented intracranial hemorrhage(OR=1.67, p=0.69), being symptomatic in the patient who received rTPA (OR=0.15, p=0.26). Among those treated with TNK vs those who did not receive fibrinolysis, there were no differences in asymptomatic hemorrhagic transformation (OR=1.44, p=0.69) or in symptomatic hemorrhage (OR=0.24, p=0.37).
Conclusions: In our series, the use of TNK prior to mechanical thrombectomy with stent implantation in the acute phase of stroke was shown to be safe and did not significantly increase the risk of symptomatic intracranial haemorrhage.
Disclosure of interest: No

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CORRELATION BETWEEN STROKE MIMICS IN IV-THROMBOLYSIS AND NEUROLOGY REGISTRARS' EXPERIENCE LEVELS IN A COHORT STUDY FROM 2017-2020

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Background and aims: After implementing a quality improvement project including simulation-based training to improve treatment times in stroke thrombolysis at our centre, there was a decrease in median door-to-needle time from 27-13 minutes and an increase in stroke mimics. During the same period, there was a large turnover of neurology registrars. Therefore, we have examined whether there is a correlation between neurology registrars' experience levels, and the proportion of stroke mimics in iv-thrombolysis (IVT) treated patients.
Methods: Using data from a local stroke registry, we conducted a cohort study, prospectively including all patients treated with IVT from Feb 1st 2017 to Feb 26th 2020 at our centre. Experienced registrars were defined as having >20 prior IVT-treatments whereas less experienced were defined as having <20 IVT treatments. The proportion of stroke mimics treated by experienced registrars was compared to those treated by less experienced registrars.
Results: The final analysis included 439 patients (table 1). There were no relevant differences concerning baseline characteristics in the two groups. For patients treated by experienced registrars the proportion of stroke mimics was 19.7%, compared to 29.3% for less experienced registrars with <20 IVT-treatments (p=0.022, table 2).
Conclusions: Experienced registrars had a significantly lower proportion of stroke mimics (19.7%) compared to their less experienced peers (29.3%). Neurology registrars' clinical experience might explain some of the variation in the proportion of stroke mimics in IVT treated patients. Future quality improvement projects focusing specifically on diagnostic accuracy in less experienced neurology registrars might be warranted

Table 1: Baseline characteristics for patients treated by experienced versus less experienced registrars

Baseline characteristics	IVT < 20	IVT > 20	p
Count	246	193	
Admission NIHSS (median)	3	2	0.463
Female	119 (48.4%)	84 (43.5%)	0.312
Age (mean)	66	65	0.217
Atrial fibrillation	20 (8.1%)	20 (10.3%)	0.420
Hypertension	112 (45.5%)	67 (34.7%)	0.022*
Previous stroke	48 (19.5%)	43 (22.3%)	0.934
Diabetes	37 (15.0%)	24 (12.4%)	0.424
Current smoker	42 (17.3%)	38 (19.8%)	0.203

Abbreviations: IVT = Intravenous thrombolysis, NIHSS = National Institute of Health Stroke Scale, *statistically significant with a p-value <0.05

Table 2: Stroke mimic proportions comparing experienced neurology registrars with their less experienced peers.

Results	IVT < 20	IVT > 20	p
Stroke mimic proportion	72 (29.3%)	38 (19.7%)	0.022*

Abbreviations: IVT = Intravenous thrombolysis, *statistically significant with a p-value <0.05

Disclosure of interest: No

NEUROINTERVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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MECHANICAL THROMBECTOMY FOR ACUTE ISCHEMIC STROKE IN PATIENTS WITH MALIGNANCY: A SYSTEMATIC REVIEW

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Background and aims: Ischemic stroke is a common occurrence in patients with concomitant malignancy. Systemic thrombolysis is often contraindicated in these patients, and mechanical thrombectomy (MT) is the preferred method of intervention. This review aims to collect the available data on the safety and efficacy of MT in cancer patients (CPs).
Methods: The PubMed/MEDLINE and SCOPUS databases were systematically searched for studies assessing safety (mortality, intracranial hemorrhage) and efficacy (reperfusion, functional outcome) indices in CPs receiving MT. Potentially relevant parameters examined in solitary studies were also extracted (e.g., stroke recurrence, brain malignancy).
Results: A total of 18 retrospective studies of various methodologies and objectives were identified. Rates of in-hospital mortality, intracranial hemorrhage of any kind, reperfusion rates, and discharge condition did not seem to present any considerable differences between CPs and patients without cancer. On the contrary, 90-day mortality was higher and 90-day functional independence was lower in CPs. Three studies on cancer-related stroke (no other identifiable etiology and high D-dimer levels in the presence of active cancer) showed constant tendencies towards unfavorable conditions.
Conclusions: Per the available evidence, MT appears to be a safe treatment option for CPs. It is still unclear whether the 90-day mortality and outcome rates are more heavily influenced by the malignancy and not the intervention itself, so MT can be considered in CPs with prospects of a good functional recovery, undertaking an individualized approach.
Disclosure of interest: No

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STROKE CARE IN NEPAL: BRINGING ADVANCED MECHANICAL THROMBECTOMY TECHNOLOGY TO NEPALESE POPULATION

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Background and aims: Acute ischemic stroke has gained importance after the thrombectomy trials in stroke namely MR CLEAN, ESCAPE etc. These studies have shown clearly the benefit of thrombectomy in recanalization in cases of large vessel occlusion if done timely in the anterior circulation. The management of cerebral aneurysm –coiling of cerebral aneurysm has been a standard of care after Aneurysm trial ISAT; Arteriovenous Malformation (AVM), dural AV fistulae (DAVF), vascular brain tumors, spinal AVM, carotid stenosis treatment have been possible with endovascular techniques .
Methods: Data were collected for all consecutive patients treated for AIS and aneurysms from March 2019 through January 2021 at two hospitals. Outcomes were successful revascularization (modified thrombolysis in cerebral infarction score of 2b-3), time to revascularization, procedural complications, and good clinical outcome (modified Rankin Scale score of 0-2) and mortality at 90 days.
Results: For AIS, 120 patients treated with ADAPT were included. The median National Institutes of Health Stroke Scale score at presentation was 13 (IQR 10-13.25). The median time from arterial puncture to revascularization was 40 minutes (IQR 30-45). Successful revascularization was achieved in 96 patients (80%). No cases of symptomatic intracranial haemorrhage occurred. Good clinical outcome at 90 days was achieved in 102 patients (85%), and the mortality rate at 90 days was 4 of 120 patients (3.4%).
Conclusions: For management of AIS, ADAPT appears to be a fast, simple, safe, and effective method in the Nepali patient population.
Disclosure of interest: No

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TEMPORAL TRENDS OF ACUTE ISCHEMIC STROKE PATIENTS TREATED WITH MECHANICAL THROMBECTOMY IN A SINGLE STROKE CENTRE

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Background and aims: The aim of this study is to describe the evolution of the characteristics and prognosis of patients treated with mechanical thrombectomy in a stroke centre over a 6-year period.
Methods: Patients treated between 2016 and 2021 in our centre have been prospectively and consecutively registered. A trend analysis of the main variables was performed.
Results: Data from 895 patients were analysed. Regarding the demographic variables, the proportion of women treated increased ($p<0.01$), with no significant differences in the main risk factors except for an increase in patients with chronic kidney disease ($p=0.02$). A higher level of dependency prior to stroke was observed ($p<0.01$). The percentage of patients treated for stroke with unknown time of onset has increased ($p<0.01$), and the proportion of patients receiving combined treatment with intravenous fibrinolysis has decreased ($p<0.01$). A progressive increase in the percentage of patients with TICI 2B-3 or TICI 2C-3 recanalisation has been observed ($p<0.001$), as well as a higher proportion of patients treated with intracranial stenting ($p=0.01$). No significant differences were observed in the proportion of patients with symptomatic haemorrhagic transformation, in hospital mortality or in functional independence or 3-month mortality.
Conclusions: In our centre, indications for mechanical thrombectomy have increased, especially in patients with higher previous disability and treated in extended window, with no significant differences in complications or prognosis.
Disclosure of interest: No

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ENDOVASCULAR TREATMENT FOR VERTEBRAL ARTERY STUMP SYNDROME

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Background and aims: Vertebral artery stump syndrome (VASS) is a rare disease resulting in posterior circulation ischaemic stroke caused by an embolus derived from stagnating flow after vertebral artery origin occlusion. Endovascular treatment (EVT) can reduce recurrent ischaemic stroke, but its efficacy needs to be better investigated. This study aims to clarify EVT's efficacy for VASS based on our experience and previous literature.
Methods: We retrospectively selected patients diagnosed with VASS between April 2021 and October 2022. In addition, we performed a literature review of studies on VASS published between 2008 and 2022. Data on patient characteristics, management courses (medical therapy and EVT), and occurrence of recurrent ischaemic stroke were collected and analysed.
Results: Three of 326 patients with acute ischaemic stroke were diagnosed with VASS during the study period. All patients experienced recurrent strokes, two underwent coil embolisation and one stenting. After EVT, none showed recurrence.
We extracted 31 cases from 17 reviewed studies. The EVT group included two patients who initially received medical treatment. Recurrent ischaemic stroke was observed in 7/18 (39%) patients after medical therapy and only in 2/15 (13%) patients after EVT. In the EVT group, recurrent ischaemic stroke was observed only after percutaneous transluminal angioplasty.
Conclusions: EVT may reduce recurrent ischaemic stroke in VASS patients. However, further research is required to determine whether EVT improves prognosis. Moreover, stenting or coiling may be more efficacious than percutaneous transluminal angioplasty.
Disclosure of interest: No

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Angioplasty and stenting in the acute phase for strokes with tandem lesions - stent thrombosis vs. hemorrhagic transformation

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Background and aims: An ischemic stroke with a tandem lesion always brings up the dilemma regarding the best antithrombotic treatment after acute angioplasty and stenting, especially in patients who have received intravenous thrombolysis (IVT) before thrombectomy.
Methods: We analyzed the data from our local registry with all the acute mechanical revascularization procedures performed in the University Emergency Hospital Bucharest.
Results: Between 2016 and 2022, a total of 523 thrombectomies were performed, with 105 cases of tandem lesions, out of which, 95 were strokes in the anterior circulation. We studied the group of 61 cases (64.2%) where a decision to place a stent at the level of the cervical carotid stenosis was made. 21 out of these patients (34.4%) have also received IVT prior to the endovascular procedure. All patients received Aspirin and Clopidogrel in loading dose during the procedure as per our national protocol and 7 (11.4%) also received a bolus of Eptifibatide. A total of 9 cases (14.7%) were diagnosed with intrastent thrombosis during follow-up. 23 (37.7%) patients had hemorrhagic transformation on the 24-hour control CT scan, out of which, 8 (13.1%) were symptomatic.
Conclusions: Our group of patients has received double antiplatelet therapy during the acute revascularization procedure. The rate of stent thrombosis was lower compared with the rate of hemorrhagic transformation of all types; however, most have suffered asymptomatic hemorrhagic transformation. Further studies are needed to better understand which is the optimal medical treatment in case of stent placement in the acute phase of a stroke.
Disclosure of interest: No

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Early And Delayed Functional Independence After Basilar Artery Occlusion Thrombectomy-Incidence And Predictors

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Background and aims: Recent trials have confirmed the benefit of endovascular thrombectomy (EVT) for basilar artery occlusion (BAO) strokes. Similar to anterior large vessel occlusion (LVO) strokes, understanding the temporal progression of functional independence after EVT for BAO strokes is essential for prognostication and rehabilitation. We aim to determine the incidence of early functional independence (EFI) and delayed functional independence (DFI) and identify associated predictors, and compare them with anterior LVO strokes in the Trevo registry.
Methods: Demographic, clinical, radiological, treatment, and procedural information were analyzed from the Trevo Registry (patients undergoing EVT for BAO). Incidence and predictors of EFI (modified Rankin Scale (mRS) score 0-2 at discharge) and DFI (mRS score 0-2 at 90 days in non-EFI patients) were analyzed.
Results: A total of 76 patients met study criteria. EFI was observed in 37% (28) of patients. Lower discharge NIHSS score was an independent

Table 1. Incidence and predictors of early and delayed functional independence after EVT for anterior LVO strokes and BAO strokes in the Trevo Registry

	Anterior LVO strokes	BAO strokes
Early functional independence (EFI)		
Incidence	45%	37%
Predictors	Younger age Lower 24-hour NIHSS score Absence of hemorrhage Lower EVT passes Absence of hypertension Absence of coronary artery disease	Lower discharge NIHSS score
Delayed functional independence (DFI)		
Incidence	35%	34%
Predictors	Younger age Lower discharge NIHSS score Absence of hemorrhage	Lower 24-hour NIHSS score

predictor of EFI [OR-0.56 95%CI-0.34-0.94, p<0.02]. Among surviving non-EFI patients (47), DFI was observed in 34% (16). Lower 24-hour NIHSS score was an independent predictor of DFI (OR-0.68 95%CI-0.54-0.85, p<0.0007). Amongst patients with functional independence at 90days, 36% experienced delayed improvement. Table-1 provides a comparison between BAO and anterior LVO strokes.

Conclusions: Approximately 37% of patients experience EFI and about one-third of non-early improvers experience DFI. 24-hour NIHSS score was an independent of DFI among non-early improvers. Delayed functional independence is an important contributor to functional outcomes after BAO EVT.

Disclosure of interest: No

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ANALYSIS OF ENDOVASCULAR STROKE CARE DURING THE FIRST WAVE OF THE COVID-19 EPIDEMIC IN A HIGH-VOLUME THROMBECTOMY CENTRE

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Background and aims: Our previous work revealed a significant disruption in ischemic stroke (IS) care during the COVID-19 epidemic in Hungary, with a significant decline in mechanical thrombectomies (MTs). Furthermore, we demonstrated a remarkable delay in IS patients' presentation in an academic non-thrombectomy stroke centre. We aimed to assess whether the COVID-19 outbreak altered the quantity and quality of endovascular IS care in our thrombectomy centre.

Methods: MT cases of our institutional registry were retrospectively analysed in March-April 2020 compared to 2019's respective period. The quantitative and qualitative parameters of endovascular IS care were compared.

Results: While the number of MTs decreased by 19% (2020: 60, 2019: 74), the weekly medians were unchanged in 2020 compared to 2019 (7 (4) vs 7 (4), p=0.42, respectively). The baseline clinical parameters were comparable (sex, age, NIHSS at admission, rate of anterior LVOs, ASPECTS, rate of IVTs, p>0,05). Although the median door-to-imaging time was prolonged significantly by 3 minutes (p=0.002), no meaningful changes could be demonstrated in the pre-and intrahospital workflow. The angiographical and clinical outcomes (i.e. mRS 0-2 at 90 days: 30/69 vs 11/40, p=0.36; mortality at 90 days: 26/68 vs 11/40, p=0.28; respectively) and safety parameters (intracerebral haemorrhage: 12/74 vs 6/60, p=0.32, respectively) were comparable between 2020 and 2019.

Conclusions: The first COVID-19 wave did not alter the endovascular IS care in our thrombectomy centre. No delay in patients' presentation could be demonstrated. Why COVID-19 had a different impact on different types of stroke centres is yet to be elucidated.

Disclosure of interest: No

1022

Comparison of treatment options for mechanical thrombectomy

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Background and aims: There is currently no consensus on the protocol to be followed in cases of mechanical thrombectomy failure.

We compared the efficacy and safety of the different treatment options used in this clinical situation in our setting.

Methods: An observational, prospective, multicenter study of standard clinical practice in patients with ischemic stroke due to middle cerebral artery or distal intracranial carotid artery occlusion, who underwent endovascular treatment without achieving arterial recanalization after four technically adequate thrombectomy attempts.

We evaluated the rate of complications, arterial recanalization, symptomatic intracranial hemorrhage (sICH) and clinical outcome at 3 months for the treatment options employed.

Results: 71 patients were included from November 2019 to December 2021. Median age was 73 years, with 54.9% being female and the median NIHSS was 17. Intracranial stenting was performed in 36 cases (with angioplasty in 21), isolated angioplasty in 5 and repeated thrombectomy attempts in the remaining 30 patients. There were no significant differences in baseline clinical-radiological characteristics between groups.

Intracranial stenting with angioplasty had the best mTICI ⩾2b arterial recanalization rates compared to repeated passes (80.95% vs. 0%) with no significant increase in the complications rate (19.44% vs. 17.14%) or sICH (8.33% vs 8.57%). Better clinical independence rates (30,55% vs. 13.33%) and lower mortality (27,7% vs 56.66%) at 3 months were also achieved.

Conclusions: Rescue intracranial stenting obtained the highest rates of clinical independence with lower mortality and similar rates of sICH and complications.

Disclosure of interest: No

1032

Low, Medium, and High-Volume Thrombectomy Centers in the Same Urban Stroke System of Care in Armenia: Comparison of Patient Selection, Time Metrics, and Outcomes

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Background and aims: Mechanical Thrombectomy (MT) has revolutionized acute stroke care. In 2019,Armenian Government funded the National Stroke Program which helped delivering MT nationwide. In this analysis, we sought to evaluate the comparative performance of MT-capable hospitals in Yerevan,Armenia.

Methods: Prospectively collected acute stroke databases from three hospitals were analyzed for baseline patient characteristics, imaging, time metrics,outcomes. Consecutive 12-month patient data was used. By annual MT volume, hospitals were stratified into one of the three groups: low(LVH,<25), medium(MVH,25-75), or high-volume thrombectomy (HVH,>75). Between group comparisons were performed.

Results: 336 MTs were performed in Yerevan in 2021: 256 at HVH,62 at MVH,and 18 at LVH. There were no significant differences in age, NIHSS, or ASPECTS between the groups. HVH patients had a significantly longer onset-to-door (OTD) time (p=0.002), shorter door-to-puncture (DTP) time (p<0.001) and higher TICI⩾2b reperfusion rate (p=0.03) compared to LVH. Thrombolysis (IVT) prior to MT was less frequent at HVH (p<0.0001). 90-day good outcomes, mortality and complication rates didn't significantly differ.

Conclusions: HVH can achieve similar outcomes to LVH after MT despite significant delays in patient arrival, due to better in-house triage protocols and reperfusion rates. Impact of patient selection and intervention duration will be analyzed further.

	OTD, min*	DTP, min*	IVT,%*	TICI⩾2b, %*	mRS 0-2,%	sICH,%	Mortality,%
LVH (n=18)	84	136	45.0 (8/18)	77.7 (14/18)	61.1 (11/18)	11.1 (2/18)	27.8 (5/18)
MVH (n=62)	169	102	40.3 (25/62)	85.4 (53/62)	46.8 (26/58)	8.1 (5/62)	32.8 (19/58)
HVH (n=256)	214	95	5.5 (14/256)	92.6 (237/256)	56.2 (144/256)	5.1 (13/256)	20.7 (53/256)

*p<0.05.

Disclosure of interest: No

1121

DIRECT TRANSPORTATION TO THROMBECTOMY-CAPABLE CENTER AS PREDICTOR OF CLINICAL OUTCOME IN PATIENTS WITH BASILAR ARTERY OCCLUSION. ANALYSIS FROM THE LONDON MULTICENTER THROMBECTOMY REGISTRY

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Background and aims: This multicenter analysis aims to investigate prognostic factors in patients with acute basilar artery occlusion (BAO) treated with mechanical thrombectomy at the thrombectomy-capable centers in London (UK), focusing on the prehospital stroke systems of care: the mothership (MS) and drip-and-ship (DS) model.

Methods: This observational multi-center study included consecutive patients with acute BAO from 2016 to 2021. Demographic, neuro-imaging and clinical data were compared between patients with good outcome, modified Rankin Scale (mRS) score of ⩽2 at 3 months, and their counterparts with mRS score of >2 at 3 months. Univariate and multivariate logistic regression analyses were performed to identify predictors of good outcome.

Results: Overall, 119 patients were included (40 good outcome group vs 79 poor outcome group). The main demographic and neuro-imaging characteristics were similar between the two groups. Patients with 90-day good outcome were more frequently directly admitted to the thrombectomy-capable center compared to patients with poor outcome (68% vs 60%, p=.042). Patients with good outcome had a shorter time delay from symptom onset to groin puncture time compared to patients with poor outcome (p=0.015). The result of the multivariate logistic regression analysis showed that TICI ⩾2b (odds ratio [OR], 1.04; 95% CI, 1.02–1.06; P=0.0001), age ([OR], 0.67; 95% CI, 0.40–1.17; P<0.0001) and MS ([OR], 1.17; 95% CI, 1.10–1.26; P=0.006) were independent predictors of good outcome.

Conclusions: Our multi-center analysis showed that MS model was an independent predictor of good outcome in patients with BAO treated with mechanical thrombectomy.

Disclosure of interest: No

1133

Mechanical thrombectomy in nonagenarians

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Background and aims: The safety and efficacy of mechanical thrombectomy (MT) in the treatment of ischemic stroke in nonagenarians has not been thoroughly studied. We present our results in this group of patients.

Methods: Retrospective analysis of a series of patients aged ⩾ 90 years, with acute ischemic stroke due to large vessel occlusion in anterior territory undergoing MT in our center in the period from April 2016 to September 2022.

Results: 803 patients underwent MT in the study period, with 56 (6.97%) of them being aged ⩾ 90 years (64.29% female). The median age was 92 years (ICR 91-94) and NIHSS 18 (ICR 11-23). 39.29% received intravenous fibrinolysis prior to endovascular treatment. The median last-seen-well to recanalization time was 311 minutes (ICR 213-597), with a recanalization rate (mTICI ⩾2b) of 73.21%. Symptomatic intracranial hemorrhage occurred in 1.79%. At 3 months, 23.21% had a good functional outcome (mRS ⩽2 or previous status), with a mortality rate of 37.5%. Patients with eTICI ⩾2c showed better functional outcome (41.38% vs 3.7%) and lower mortality (27.58% vs 48.15%) compared to those with eTICI <2c. Cortical infarct on baseline CT was associated with poor functional outcome.

Conclusions: MT in nonagenarians appears to be safe and beneficial, achieving good functional outcome at 3 months in cases where eTICI ⩾2c recanalization was achieved and there was no cortical infarct on baseline CT.

Disclosure of interest: No

1143

Endovascular treatment in patients with acute ischemic stroke and low NIHSS scores. The ALOWS (Andalusian LOW NIHSS Stroke recanalization) Study for posterior circulation stroke

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Background and aims: The success of the thrombectomy trials has resulted in a significant change in management of acute ischemic stroke. However, it is still unclear how to manage patients that present with low NIHSS score, especially in patients with posterior circulation stroke. We sought to review our experience of endovascular treatment (EVT) in patients with low NIHSS, and posterior circulation vessel occlusion.
Methods: From a prospectively maintained database (ARTISTA), we retrospectively reviewed cases of acute ischemic stroke which underwent EVT in two centers with a high volumen of care between 2017-2021. We included patients with posterior circulation stroke and low NIHSS (⩽8) on admission. We established 3 different groups in relation to the presenting NIHSS: group-1 (NIHSS:0-2), group-2 (NIHSS:3-5), and group-3 (NIHSS:6-8). We collected demographic, radiological, procedural and outcome data.
Results: We included 116 patients: 15, 51, and 50 in each group, respectively. The mean age was 63, 69, and 68.5, respectively, with a total of 82 male patients. Associated medical conditions were common in all three groups. Over 70% presented with occlusion of the basilar artery, including tandem-occlusions. Successful recanalization (TICI⩾2b) was obtained in 93.3%, 88.2%, and 80%, respectively, and no patient presented symptomatic hemorrhage. At 90-day follow-up, 60%, 72.9%, and 52.1% of the patients had mRS 0-2, including 46.7%, 56.3%, and 33.3% with mRS 0-1.
Conclusions: EVT in patients with posterior circulation stroke and low NIHSS is possible and successful with a good safety profile, and should be considered for these patients.
Disclosure of interest: No

1523

THE OUTCOME OF PATIENTS WITH LARGE VESSEL OCCLUSION WHO DID NOT PROCEED TO THROMBECTOMY

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Background and aims: We use the drip-and-ship model for our regional mechanical thrombectomy (MT) service. After arriving at our neuroscience centre, a decision is made whether patients would benefit from proceeding to MT. We aim to investigate why patients did not proceed to MT and their clinical outcome (Modified Rankin Scale (mRS)) at 90-days.
Methods: External stroke referrals between July 2016 and December 2021, who did not proceed to MT, were identified from retrospective registry. Patients' baseline characteristics, presentation, imaging findings, thrombolysis status, timings and mRS at 90-days were recorded.
Results: 217 patients transferred for MT did not proceed. 44 were excluded: 22 without outcome data, 13 with no target and 9 with haemorrhagic transformation. Based on arrival presentation, the remaining 173 patients were divided into either not suitable for MT (NS), mostly due to established infarction (NS; N=106) or clinically improved (CI; N=67). Group NS were older (median 73 vs 66years) and had higher rates of heart disease. Group CI had higher rates of good collaterals (91% vs 54%), better 90-day outcomes (mRS 0-2; 91% vs 8%) and lower mortality (1% vs 35%). One patient in group CI later died due to recurrent stroke. 42% of patients in NS group had transfer delays.
Conclusions: Patients who did not proceed to MT, due to established infarction, were more likely to be older, have poorer collaterals and heart disease ultimately resulting in poorer clinical outcomes. Those in group CI were more likely to remain well resulting in good 90-day outcomes.
Disclosure of interest: No

1541

Static and Dynamic Blood Pressure during Endovascular Therapy for outcomes of Ischemic Stroke: A two-center Study

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Background and aims: Current guidelines recommend maintaining blood pressure (BP) level of less than 180/105 mmHg during and for 24 hours after endovascular thrombectomy (EVT). However, the evidence regarding an appropriate intra-procedural BP low threshold for better functional outcome is lacking. In view of insufficient evidence, we performed a two-center study to test the association between post-EVT neurological outcomes and different cut-off values of static and dynamic intra-procedural BP target.
Methods: We had conducted a cohort study from January 2016 to December 2019 from two EVT-capable comprehensive stroke centers in Taiwan. We included patients with presence of large artery occlusion in the anterior circulation receiving EVT within stroke onset of 8 hours. BP parameters including mean BP values as static BP level and BP variability as dynamic BP level were all recorded. Outcomes was defined as functional outcomes categorized by modified Rankin scale (mRS).
Results: A total of 184 patients receiving EVT were identified from these two hospitals. For static BP level, mean SBP higher than 140 mmHg was independently associated with reducing poor functional outcome at 3 months (adjusted odds ratio, aOR 0. 34, 95% CIs, 0.15–0.74)(Table 1). While for dynamic BP level, higher SBP coefficient variance (CV) had higher rate of poor functional outcomes at 3 months in multivariable analysis (aOR, 2.36, 95% Cis, 1.06–5.51)(Table 1).
Conclusions: During EVT, acute ischemic stroke patients with mean SBP higher than 140 mmHg and less BP fluctuation, indicating lower BPV, were associated with better functional outcomes at 3 months.

Table 1. The association between different target of intra-procedure static and dynamic blood pressure and 3-month poor functional outcome.

				Good	Poor(mRS≥3)	univariate				Multivariate model 1			Multivariate model 2			Multivariate model 3		
	N	Mean	std	n	%	n	%	OR	95%CI	p	OR	95%CI	p	OR	95%CI	p	OR	95%CI	p
Adjusting factors: Model 1 - Age, biological sex, HL, glucose at ER, ER NIHSS; Model 2 - model 1 + SICH; Model 3 - Model 1 + TICI 2b/3																			
Static SBP target																			
SBP: 130 mmHg																			
Mean SBP ≤ 130 mmHg	75	116.85	8.77	14	28.00	59	45.74	ref			ref			ref			ref		
Mean SBP > 130 mmHg	109	153.57	18.16	36	72.00	70	54.26	0.46	(0.23, 0.94)	0.032	0.40	(0.17, 0.90)	0.033	0.44	(0.19; 1.00)	0.058	0.38	(0.16, 0.89)	0.032
SBP: 140 mmHg																			
Mean SBP ≤ 140 mmHg	104	121.73	10.94	21	42.00	80	62.02	ref			ref			ref			ref		
Mean SBP > 140 mmHg	80	160.53	16.24	29	58.00	49	37.98	0.44	(0.23, 0.86)	0.017	0.34	(0.15; 0.74)	0.008	0.34	(0.15, 0.76)	0.010	0.30	(0.13; 0.67)	0.005
Dynamic BP target																			
SBP-SD																			
SBP-SD low	92	9.81	4.10	27	55.10	63	48.84	ref			ref			ref			ref		
SBP-SD high	91	26.24	9.26	22	44.90	66	51.16	1.29	(0.66; 2.49)	0.456	1.51	(0.68; 3.41)	0.318	1.53	(0.68; 3.54)	0.312	1.60	(0.72; 3.67)	0.262
SBP-CV																			
SBP-CV low	92	0.071	0.032	30	61.22	59	45.74	ref			ref			ref			ref		
SBP-CV high	91	0.193	0.065	19	38.78	70	54.26	1.87	(0.96; 3.66)	0.067	2.36	(1.06; 5.51)	0.042	2.35	(1.04; 5.55)	0.046	2.54	(1.12; 6.04)	0.031

mRS: modified Rankin scale; SBP: Systolic blood pressure; HL: Hyperlipidemia; ER: Emergent Department; NIHSS: National Institutes of Health Stroke Scales; SICH: Symptomatic intracranial hemorrhage; TICI: Thrombolysis in Cerebral Infarction; SD: standard deviation; CV: Coefficient of variance

Disclosure of interest: No

1593

Clinical impact of anesthesia choice in posterior circulation large vessel occlusion stroke patients: results of the MORPHEUS Stroke Registry

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Background and aims: It is unknown whether any anesthesia approach correlates with better clinical outcomes in endovascular treatment (EVT) in patients with posterior circulation ischemic stroke and large vessel occlusion (PCLVO).

We aimed to analyze whether local anesthesia (LA), conscious sedation (CS) or general anesthesia (GA) are associated with higher rates of functional independence (mRS 0-2) at 3 months in patients with PCLVO who received EVT.

Methods: We designed a prospective, observational, multicenter study involving 19 tertiary stroke centers (ClinicalTrials.gov Identifier: NCT05082896). The inclusion period was from January 2021 to March 2022.

Main outcomes included were baseline NIHSS, time from onset to reperfusion, reperfusion rates, type of anesthesia, hemodynamic monitoring during the procedure and follow up at 24 hours, discharge and 90 days. A multivariate analysis was performed to identify variables associated with functional independence at 90 days.

Results: During this period, 180 patients were included, of whom 72 (40%) were women. A total of 79 patients (43.9%) were treated with GA and 89 patients (49.4%) achieved a mRS of 0-2 at 3 months.

In the multivariate analysis, LA use and age were the only two variables independently associated with functional independence at 3 months. These results were not modified after excluding patients intubated before hospital arrival. No differences were observed between CS and GA.

Conclusions: In our study, the use of LA and age were independently associated with functional independence at 3 months in patients with OGVCP treated endovascularly.

Disclosure of interest: No

1616

GENERAL ANESTHESIA VS. CONSCIOUS SEDATION FOR ENDOVASCULAR TREATMENT IN PATIENTS WITH ANTERIOR AND POSTERIOR CIRCULATION ACUTE ISCHEMIC STROKE: A META-ANALYSIS OF SEVEN RANDOMIZED CLINICAL TRIALS

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Background and aims: There is no consensus regarding the choice of anesthetic approach during endovascular therapy. We included randomized clinical trials (RCTs) comparing the conscious sedation (CS) vs. general anesthesia (GA).

Methods: Data from RCTs were pooled with risk ratios (RRs) and 95% CI.

Results: Results of six anterior circulation (AC, n=883) and one posterior circulation (PC, n=87) RCTs revealed non statistically significant difference between GA and CS for functional independence at 90 days [risk ratio (RR) = 1.14, 95% CI: 0.97–1.33, p = 0.11; I^2 = 8%] but the results of the AC subgroup showed significant statistical difference favoring GA (RR = 1.18, 95% CI: 1.01–1.38, p = 0.04; I^2 = 1%) and this was not evident for PC (RR, 0.89; 95% CI, 0.58-1.38). Successful recanalization showed a statistically significant results favoring GA (RR = 1.13, 95% CI: 1.05–1.21, p = 0.0009; I^2 = 26%) and similarly in both subgroups. There were no significant statistical differences in intracranial hemorrhage (RR = 0.93, 95% CI: 0.67–1.29, p = 0.66; I^2 =80%) or mortality (RR = 0.93, 95% CI: 0.71–1.22, p = 0.66; I^2 =81%). However, GA showed a higher risk of hypotension compared to CS (RR = 1.72, 95% CI: 1.27–2.33, p = 0.66; I^2 =81%).

Conclusions: GA resulted in higher rates of reperfusion compared to CS despite being associated with higher rates of hypotension. Since many of the included studies were small and single center, more studies are warranted to support these findings.

Disclosure of interest: No

1829

Influence of COVID-19 pandemic on Mechanical Thrombectomy: A single center study

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Background and aims: COVID-19 pandemic affected the care of stroke in worldwide. We aimed to analyze clinical features of mechanic thrombectomy (MT) cases before and after the pandemic.

Methods: We included patients with MT between 2018 and 2022 at Istanbul University Stroke Registry. Vascular risk factors, baseline NIHSS, recanalization time and clinical outcome were evaluated.

Results: Sixty-seven patients were included, 20 of them admitted during pandemic. The mean age was 72, 4 (11,4) and 69,4 (13,1) years for pandemic (PG) and prepandemic group (PrePG) respectively. There were no significant differences in female to male ratio and stroke risk factors except hyperlipidemia between the 2 groups. NIHSS was higher in PG [median 18

(7-36) and 16 (1-25), p:0.29]. Intravenous thrombolysis and intensive care unit admission rates were similar. Interestingly recanalization time was shorter in the PG (195 minutes); PrePG (310 minutes). However clinical outcome was not improved in the PG compared to that in the PrePG. Median NIHSS was found 4 (IQR 1.5-10) in PrePG and 10 (IQR 2-15) in PG group, although the diference was not statistically significant. Mean MT per month was 0,6 in PG fewer than PrePG (1,6). Only 2 patients had concomitant COVID-19 infection and acute stroke with discharge mRS 5 and 2.

Conclusions: Our results showed that clinical outcome did not differ between PG and PrePG. The lack of any significant differences between the pre and pandemic period outcomes may be attributable to our low volume single center.

Disclosure of interest: No

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Mechanical Thrombectomy for Anterior Cerebral Artery Occlusion: A Single-Center Experience

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Background and aims: Mechanical thrombectomy (MT) is an effective treatment for acute ischemic stroke (AIS) with large-vessel occlusion (LVO). The efficacy and safety of MT for LVO were demonstrated, however there are few studies associated with medium vessel occlusion including ACA. In this study, we reviewed retrospectively the patients who had underwent MT for ACA occlusions.

Methods: The patients with ACA occlusions were classified into primary and secondary occlusion groups as its etiology. The National Institutes of Health Stroke Scale (NIHSS) and the modified Rankin Scale (mRS) were measured for examining the neurologic and clinical status. The modified Treatment In Cerebral Ischemia (mTICI) scale was used for reperfusion grade.

Results: Among 520 patients who underwent MT for Anterior Circulation occlusion during 48 months, 41 patients (41/520, 7.88%) were ACA occlusion. The primary occlusions were 18 and the secondary occlusions were 23. At 90 days, 13 patients (31.71%) had a good clinical outcome with mRS score of 0 to 2. The successful recanalization was achieved in 38 patients (38/41, 92.68%) as mTICI 2b and 16 patients (16/41. 39.02%) as mTICI 3. Hemorrhagic complications of ACA territory were noted on 6 patients. The good prognosis group was younger, had less time from puncture to recanalization, more frequent mTICI 3, and less any hemorrhage.

Conclusions: In the presented study, less recanalization time and complete recanalization above mTICI 2b grade were important for better clinical outcomes in patients with acute ACA occlusion. The MT for ACA occlusion is feasible and safe compared to LVO.

Disclosure of interest: No

1966

EARLY-WINDOW CAROTID ARTERY STENTING IS A SAFE AND EFFECTIVE TREATMENT IN PATIENTS WITH TIA/MINOR STROKE AND CAROTID ARTERY STENOSIS IN THE ABSENCE OF INTRACRANIAL OCCLUSION

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Background and aims: The optimal timing for carotid artery stenting (CAS) in patients with minor stroke/TIA and moderate carotid artery stenosis remains unclear. The aim of the current study was to define the efficacy and safety of CAS in patients treated within eight days of symptoms of TIA/minor stroke.

Methods: We retrospectively analyzed all patients with symptomatic carotid artery stenosis and TIA/minor stroke treated in the first eight days after ischemic event with CAS at a tertiary stroke center from July 2019 - January 2022. Adjusted logistic regression models were used to define independent efficacy and safety outcome predictors.

Results: A total of 111 patients (71.2% male, mean age 71.7 +/- 11.8 years) were included. Mean time from symptom onset to treatment was 3.84 days (0-8 +/-2.3 days); mean NIHSS score at onset was 3.23+/- 3.57 (range 0-18).

The rate of clinical recurrence was 6% (6/99); variables independently associated with recurrence risk were history of ischemic heart disease (p=0.001), symptom-onset-to-treatment time (p= 0.031), and atrial fibrillation (AF) (p=0.001).

The overall mortality rate was 4/111 (4.5%) and was independently associated with high initial NIHSS (p=0.002) and 24-hour in-stent stenosis (p=0.022. A total of 4/111 (3.6%) intraprocedural complications occurred and were associated independently with AF (p= 0.043).

In-stent stenosis was observed on 24-hour ultrasound in 9.8% of patients (10/102). Older age and diabetes were independently associated with restenosis risk (p=0.28 and p=0.25, respectively).

Conclusions: Performing CAS within eight days after TIA/minor stroke is safe with low risks of complications and clinical recurrence.

Disclosure of interest: No

1982

Is mRankin scale correlated with mTICI? A systematic review, meta-analysis and meta-regression on randomized controlled trial and registries

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Background and aims: The purpose was to evaluate the numeric correlation between modified treatment in cerebral infarction(mTICI)⩾2b/3 and modified Rankin-Scale(mRS)⩽2 in RCT and registries.

Methods: Literature research was performed on Pubmed/OVID for studies in 2015-2021. Meta-analysis with random effect model was performed. Meta-logistic and meta-linear regressions were used to correlate mTICI and mRS in both RCTs and registries. Z-test was used for comparing coefficients between RCTs/registries.

Results: We evaluated thirty-four studies (17 registries; 17 RCTs) for 29540 patients (27031 from registries (median registry 1192.0[CI95% 698.7-1992.8]; 2509 from RCTs [median RCT 165.0[CI95% 98.1-234.0]). 10/17(58.8%) registries considered also vertebrobasilar system strokes. Overall mRs⩽2 was 46.0 (CI95% 43.8-48.3) with I^2=92.6%.

The odd-ratio of obtaining a mRS⩽2 for a singular increased of mTICI⩾2b rate was: 1.49(CI95% 1.22-2.01) for all studies (for 1% increase of mTICI⩾2b the odds for obtaining mRS⩽2 was 1.49), 1.50(CI95% 1.00-2.23) for RCTs and 1.50(CI95% 1.10-2.23) for registries. mTICI⩾2b and mRS had a positive correlation with coefficient of 0.49(CI95% 0.22-0.75, p=0.001) for all studies (for 1% increase of mTICI⩾2b the mRS⩽2 rate augment by 0.49%), 0.51(CI95% 0.10-0.91) for RCTs and 0.46(CI 95% 0.09-0.84) for registries.

No differences were found in coefficients between RCTs/registries (p=0.50; p=0.57; respectively).
Conclusions: Unitary increased of mTICI⩾2b rate correspond to an augment of mRS⩽2 by 0.49(CI95% 0.22-0.75) with odd-ratio of obtaining mRS⩽2 of 1.49(CI95% 1.22-2.01), without significantly differences in coefficients.
Disclosure of interest: No

2005

The impact of anti-aggregation therapy in tandem lesions: systematic review and meta-analysis

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Background and aims: To investigate the impact of peri-procedural anti-aggregation therapy administration during endovascular treatment for tandem lesions (TL) to provide updated clinical evidence of therapeutic selection.
Methods: We conducted a systematic review and meta-analysis between 2015 until 2022 for studies concerning endovascular treatment of TL. Antiplatelet therapy, rate of intra-stent occlusion, rate of mRS⩽2 and mortality rate were recorded. Studies with intra-studies differences among anti-platelet .
Results: The population encompassed 11 studies for a total of 284 Patients; 1/11 (9%) study (24 patients)reported Aspirin as anti-aggregation strategy(Group I), 7/11 (63%) studies (160 patients) considered Dual Antiplatelet Therapy [DAPT](Group II), 1/11 (9%) study (29 patients) experienced GpIIb/IIIa (Group III) and 2/11 studies (18%) (59 patients) defined DAPT i+ GpIIb/IIIa (Group IV).
Acute intra-stent occlusion occurred in 4 cases (18.3%), 2 cases in Groups III and IV respectively.
Rate of mRS⩽2 was non-significantly higher in Group II (38.3%; Odd Ratio: 1.93, 95% CI: 1.61– 2.31, p> 0.05) compared with Group IV (8.09%). Rate of mortality was significantly lower in Group II then Group IV (4.9% vs 3.1%; (Odd Ratio: 1.04, 95% CI: 1.12–1.02, p< 0.001).
Conclusions: The best therapy in TL is represented by DAPT in which, even if there have been cases of intra-stent occlusion, better trends in terms of mRS Scale and mortality have been observed compared to other therapeutic protocols.
Disclosure of interest: No

2008

THE POTENTIAL CAUSES OF DISCREPANCY BETWEEN RADIOLOGICAL OUTCOME AND FUNCTIONAL OUTCOME AFTER MECHANICAL THROMBECTOMY

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Background and aims: Mechanical thrombectomy (MT) is an effective treatment for acute ischaemic stroke secondary to large vessel occlusion. However, there can be a discrepancy between radiological and functional outcomes (Modified Rankin Scale (mRS)) at 90-days. We aim to explore potential factors that attribute to this discrepancy.
Methods: We conducted a retrospective study using data obtained between January 2018 and June 2022. Patients were divided into two groups: (G) good functional outcome (mRS⩽3) when ASPECTS ⩽5 on 24hr post-MT imaging; and (P) poor functional outcome (mRS⩾4) when ASPECTS ⩾6. Baseline characteristics, radiological findings and functional outcomes were recorded.
Results: 551 patients with anterior circulation stroke were screened; 76 patients were included in group G, 43 patients in group P. No significant difference in pre-stroke mRS, stroke severity at presentation (National Institute of Health Stroke Scale), laterization of stroke, anaesthetic methods, thrombolysis rates or time from onset to recanalization. Group G had lower rates of tandem occlusion, good collaterals and successful recanalization (mTICI 2b/3, p<0.005). Patients in group G were younger (p<0.001), male (p=0.01), had lower rates of hypertension (p=0.002), hyperlipidaemia (p=0.004), and atrial fibrillation (p=0.003), but no significant difference in diabetes or cardiac diseases.
Conclusions: Patients with poor collateral and less successful reperfusion results in worse radiological outcomes. Younger, male patients with fewer stroke risk factors may have better clinical outcome. Older patients with more co-morbidities may result in worse functional outcomes, despite better radiological outcomes. Laterization of stroke does not attribute the discrepancy.
Disclosure of interest: No

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ENDOVASCULAR TREATMENT FOR CEREBRAL VENOUS SINUS THROMBOSIS AND ITS OUTCOMES- AN EXPERIENCE IN TERTIARY CARE CENTER IN SOUTH INDIA

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Background and aims: Cerebral venous sinus thrombosis(CVST) is a rare disease which has established medical treatment. However, 15% of patients remains refractory to treatment. The selection of patients for Endovascular treatment(EVT) remains a challenge. The study aims to characterize patients treated with EVT and analyse the factors associated with good outcome
Methods: This is a single-centre, retrospective case-file analysis of CVST patients, who underwent EVT from 2009 till 2022. mRS <3 was considered as good outcome. Appropriate statistical methods were used to express the data.
Results: Forty-five patients were included. Mean age of the cohort was 33.8±12.8 years with 27(60%) males and 18(40%) females. The clinical profile of patients is illustrated in table1. Acute thrombus was present in 24(49%), rest had subacute thrombus. All patients received maximum medical treatment. The indications for EVT were drop in GCS in 16(33.3%) and non-improvement of symptoms 15(31.3%). The procedure was done after a mean duration of 10.1±12.4 days from symptom onset. Insitu thrombolysis was done in 19(38.8%) patients, thromboaspiration was done in 13(26.5%). Partial recanalization was observed in 25(51%), near total recanalization in 12(24.5%). Twenty(41.7%) patients had good-outcome at discharge.
Conclusions: EVT yields good results in carefully selected,medically refractory CVST patients

S.no	Clinical parameters	N(%)
1	**Presenting symptoms**	
	• Headache	40(81%)
	• Seizures	22(44.9%)
	• Altered sensorium	12(24.5%)
2	**Syndrome**	
	• Raised ICT	20(40.8%)
	• Focal neurological deficit	12(24.5%)
	• Encephalopathy	13(26.5%)
3	**Duration of symptoms (mean±SD)**	8.5±11.9
4	**Etiology**	
	• Hyperhomocysteinemia	12(24.5%)
	• Anemia	11(22.4%)
5	**Duration of Hospital stay(mean±SD)**	20.7±15
6	**Sinuses involved**	
	• Superiorsagittalsinus	38(77.6%)
	• Transverse sinus	25(51%)
	• Deep sinuses	10(20.4%)

Disclosure of interest: No

2160

GEOGRAPHICAL DISTRIBUTION OF MECHANICAL THROMBECTOMY CASES REFERRED TO A TERTIARY REFERRAL CENTRE IN THE SOUTH OF IRELAND TO PREDICT OPTIMAL LOCATION OF NEURO-RADIOLOGY CENTRE

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Background and aims: Two models of patient transfer exist in the endovascular treatment of large vessel occlusion (LVO) stroke, the Drip-and-Ship model of transfer to a thrombolysis centre prior to thrombectomy centre versus the Mothership model of bypass directly to a thrombectomy centre.
Cork University Hospital is a supra -regional hospital serving 1.36 million people in a catchment area that spans more than 24,675 square kilometres. The model of care used in CUH is the drip-and-ship model when outside a certain distance and the mothership model when closest to CUH. The National Thrombectomy Report (2021) has an overall thrombectomy rate of 8.5%, CUH has had an increase of 50% in the number of thrombectomy cases performed between 2021 and 2022.
Methods: By plotting the location of each patient on a map of Munster who underwent mechanical thrombectomy in the past three years, a total number 321 patients, we will attempt to pinpoint the ideal location for a neuro-interventional centre within this large province.
Results: Map 1: Starting location of each patient referred to CUH for mechanical thrombectomy over past three years, with hub and spokes of current transfer model
Map 2: Theoretical model of care using a bypass model to a certain distance from the neuro-interventional centre
Conclusions: Location of a neuro radiology interventional centre should be population based. Widely spread rural populations offer challenges in providing thrombectomy intervention in a timely manner to all eligible patients.
Disclosure of interest: No

2462

OCCLUSION RATE OF UNRUPTURED WIDE-NECKED SACCULAR INTRACRANIAL ANEURYSMS TREATED USING THE WOVENENDOBRIDGE (WEB) DEVICE OR STENT-ASSISTED COILING (SAC)

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Background and aims: To compare the occlusion rates of unruptured wide-necked saccular intracranial aneurysms treated with either Stent-assisted coiling (SAC) or the WovenEndobridge (WEB) device.
Methods: We performed a retrospective case and control study using adult patients treated for unruptured wide neck bifurcation aneurysms in National Institute of Neurology and Neurosurgery in Mexico City from 2020 to 2022. Patients were treated using either the WEB device or the traditional SAC technique. Occlusion rate was determined 90 days after treatment using Digital Subtraction Angiography (DSA).
Results: 14 patients were included in the study, 8 treated with SAC and 6 with the WEB device. No gender or demographic differences were found. Median aspect ratio indexes of the aneurysms were 1.45 [1.25-1.82] for the WEB group and 1.67 [1.16-2.11] for the SAC group ($p>0.05$). Median neck to dome ratio was 1.35 [1.04-2.42] for the WEB group and 1.26 [1.17-1.77] for the SAC group ($p>0.05$). Successful complete occlusion rate was achieved in 6/6 patients from the WEB group and 6/8 patients in the SAC group ($p= 0.308$). No statistically significant differences were found between complications, mRS or Hospital Length of Stay (LOS) ($p>0.05$).
Conclusions: The WEB device, while still a novel technique undergoing exploratory use in Mexico, has proven to be as safe and effective as other widely used techniques such as the SAC.
Disclosure of interest: No

2499

EARLY EXPERIENCE IN NON-RUPTURE INTRACRANIAL ANEURYSMS WITH FLOW DIVERTER DEVICES IN MEXICO

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Background and aims: Flow Diverters (FD) are stent-like devices that allow aneurysms occlusion that by their characteristics, shows a high failure rate when use coil or coil assisted techniques. Nevertheless, their efficacy has not been evaluated in medium income countries. Our aims was calculate the non-rupture intracranial aneurysm occlusion percentage in embolized patients using FD.
Methods: Longitudinal, retrospective study, including patients attended in the National Institute of Neurology and Neurosurgery between November 2020 – April 2022. Patients above 18 years old with non-rupture intracranial aneurysm who were treated with FD and had a follow-up diagnostic angiography at 3 or 6 months. The occlusion rate was assessed through the O´Kelly-Marotta scale.
Results: 23 patients was included (two with a double aneurysm simultaneous treatment), 20 women with mean age 51.4 ± 13.3 yo. 19 saccular, 4 fusiform and 2 dissecting aneurysms were treated. Neck measures were between 1.9 – 19 m. An associated angioplasty was performed in 4 patients; in whole treatments a succeed deployment was obtained.

14 patients get a complete occlusion, 3 had a neck remanent less than 5%. 3 late procedure-related complications were identified .
Conclusions: Patients who where treated with FD in our institution showed complex aneurysms and their use used to be secure with a high efficacy rate similar to described in the international literature.
Disclosure of interest: No

2648

RESOLUTION OF ACUTE ISCHEMIC VASCULAR STROKE WITH TANDEM LESION IN THE ANTERIOR CIRCULATION

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Background and aims: Endovascular management of acute stroke caused by a tandem lesion (TL) in the anterior circulation is currently a discussed area. Acute insertion of a carotid stent in the absence of antiaggregation premedication often leads to acute stent occlusion with clinical impact. Conversely, early anticoagulation or anticoagulant therapy after intravenous thrombolysis can lead to hemorrhagic complications. The goal of our work is the analysis of different approaches to the problem in our file.
Methods: Patients who underwent mechanical thrombectomy (MT) between 2008 and 2022 were included in a retrospective monocenter study. Neurological deficit was assessed with National Institutes of Health Stroke Scale (NIHSS), clinical outcome with modified Rankin scale (mRS) and achieved recanalization using the TICI scale.
Results: We compared only patients who underwent successful MT (TICI 2b-3). 81 patients had a stent inserted during MT (58% males, mean age 67.4 $\pm$ 8.8 years). A good clinical result (mRS 0-2) was achieved by 61.7% of patients. Mortality was 17.3%. In 101 patients (48.5% males, mean age 71.6 $\pm$ 12 years) the stent was not inserted and an alternative solution was chosen (retention of residual stenosis - mainly patients in severe clinical condition, elective stent insertion days after effective antiaggregation therapy or carotid endarterectomy-CEA). A good clinical result was achieved by 57.4% of patients. Mortality was 24.8%.
Conclusions: There was no significant difference in achieving a good clinical outcome between the groups with acute stenting or with the alternative procedure
Disclosure of interest: No

SECONDARY PREVENTION – EXCLUDING CLINICAL TRIAL RESULTS

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Potential role of PCSK9 inhibitors in stroke prevention

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Background and aims: Hyperlipidemia is a modifiable risk factor for stroke, with the magnitude of LDL-C reduction correlating to risk of recurrent ischemic stroke. Proprotein convertase subtilisin/kexin type 9 (PCSK9) inhibitors are used if the LDL-C target is not achieved despite maximally tolerated statins with ezetimibe. We investigated the potential role of PCSK9 inhibitors in our stroke population.
Methods: Retrospective review of patients with acute ischemic stroke between 2019 – 2020. We estimated the probability of benefit from PCSK9 treatment with the following criteria: LDL $>$ 190 regardless of treatment, LDL 161-190 on any dose statin therapy, and LDL 131-160 on high intensity statin therapy.
Results: 774 patients with ischemic stroke were evaluated. Mean age 62.8 +/- 13.2 with 57% male (52% Black, 42% White). 584 (75%) of these patients had LDL above goal. One patient was on PCSK9 therapy on admission. Although the majority of patients had uncontrolled cholesterol, only one additional patient would meet the strict prescription criteria for PCSK9 therapy of being adherent to maximal tolerated statin dose and ezetimibe with LDL above goal. Potential patients with estimated benefit include LDL $>$190 (20 patients), LDL 161-190 (16 patients), LDL 131-160 (13 patients). This amounts to 6.7% of stroke patients who we would expect to need PCSK9 inhibitors to achieve a target LDL level.
Conclusions: Using conservative projections, we estimate that about 1 in 14 patients with ischemic stroke could benefit from PCSK9 therapy. Achieving LDL targets more consistently is a promising approach to decreasing the recurrent stroke rate.
Disclosure of interest: No

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Sub-optimal lipid reduction after transient ischaemic attack. A need for a systematic approach to optimising lipid-lowering therapy

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Background and aims: Hyperlipidaemia is a major modifiable risk-factor to prevent ischaemic stroke after transient ischaemic attack (TIA). Intensive lipid lowering after TIA to total cholesterol (TC) <3.8mmol/L and low-density lipoprotein-C (LDL) <1.8mmol/L has been demonstrated to reduce subsequent vascular events. The full lipid-profile (lipids) should be re-checked after 3-months and if targets are not met, medication adherence, a higher dose or statin alternative should be considered as per guidelines.
Methods: We retrospectively analysed Neurovascular clinic records between 1/1/20 and 30/6/20 at a large university hospital in the U.K. Baseline clinic lipids and follow-up (6-months) were collected, alongside the advice to GPs in clinic letters after TIA diagnosis.
Results: 40.2% of the included 168 patients were already taking a statin (Table 1). Baseline lipids were collected in 127/169 (75.6%) patients. From those with baseline lipids, only 49 (38.6%) had follow-up check by 6-months. **Of these only 14 (28.6%) achieved TC <3.8 and 18 (36.7%) LDL <1.8.** Clinic letter review revealed 58.0% contained no lipid-modification advice, only 10.7% mentioned a target range and <3% mentioned a timepoint for repeat check (Table 2). Statin dose adjustments or change to alternative lipid-lowering agent were not carried out in any patients and lifestyle measures were not mentioned in any clinic letters.
Conclusions: Lipid lowering is a crucial part of secondary prevention after TIA. A systematic, guideline-based approach to lipid lowering is vital, including patient education, clearer communication with primary care and regular monitoring of lipids.

TIA patients	n
n	168
Age (Q_1-Q_3)	77 (65-84)
Female (%)	87 (51.5)
Hypertension	101 (59.8)
Hypercholesterolaemia	61 (36.1)
Congestive Cardiac Failure	2 (1.2)
Diabetes	23 (13.6)
Ischaemic Heart Disease	24 (14.2)
Previous stroke or TIA	36 (21.3)
Taking a statin	68 (40.2)

Table 1.

Assessment and advice to primary care, n (%)	
Baseline lipid profile check	128 (75.7)
Lipid profile advice to primary care	71 (42.0)
Started on a statin, or advice to primary care to start	42 (41.6)
Target range for total cholesterol and LDL	18 (10.7)
Ask to re-check lipids at all	4 (2.37)
Ask to re-check lipids at 3- or 6- months	4 (2.37)

Table 2. Advice to primary care.

Disclosure of interest: No

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IMPACT OF HYPERTENSION ON PATIENTS WITH FIRST-EVER ISCHEMIC STROKES: A 20-YEAR RETROSPECTIVE STUDY

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Background and aims: Hypertension (HT) is a major risk factor for stroke. Our aim was to assess whether the impact of hypertension on ischemic stroke has increased in the last two decades.
Methods: Retrospective study on first-ever ischemic stroke patients discharged from 3 tertiary general hospitals in Seville (Spain), during the periods: 2019-2020, five years (2014-16) and 20 years before (1999-2001). Data analysis was performed using SPSS.
Results: We included 1,379 patients, 588 (42.6%) women, mean age 69.1 (± 11) years. Comparing the periods, patients now have a higher frequency of HT (65.9% vs. 69.6% vs. 74%; p = 0.029). HT was the most prevalent vascular risk factor in all periods. HT was especially frequent in patients ⩾80 years of age (73% vs. 81.9% vs. 85.2%; p = 0.029). At discharge, more antihypertensive drugs were progressively used (in 65% vs 85.1vs 90.2% of patients; p = 0.0001). There was a clear increase in the number of antihypertensive drugs used (mean 0.97 ± 0.8 vs 1.5 ± 1 vs 1.8 ± 0.8 drugs; p = 0.0001). Use of diuretics (13.7%-39.3%-65.3%; p = 0.0001), angiotensin-converting enzyme inhibitors (35.5%-43.3%-53.4%; p = 0.0001), and angiotensin receptor blockers (12.2%-24%-32.4%; p = 0.0001) increased progressively. On the contrary, use of calcium antagonists decreased (24%-19.9%-13.7%; p = 0.0001).
Conclusions: Our data show that there is an increase in the proportion of HT among first-ever ischemic stroke patients in the last two decades, with a significant increase in antihypertensive medication use.
Disclosure of interest: No

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ASSOCIATIONS BETWEEN DUAL ANTIPLATELET AND FAVORABLE OUTCOMES IN ACUTE MINOR ISCHEMIC STROKE PATIENTS WITH AN ONSET TO DOOR TIME WITHIN OR BEYOND 24 HOURS

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Background and aims: This study aimed to investigate the association of dual antiplatelet (DAT) on the outcome of acute minor ischemic stroke (AMIS).
Methods: Patients were from a prospective registry of a single comprehensive stroke center. Patients with AMIS, defined as an NIHSS score $<$ 4, and onset to door time (OTDT) in 7 days were divided into two groups by the OTDT within (early group) or beyond 24 hours (late group). Factors of a favorable outcome in the 3rd month were analyzed in each OTDT group.
Results: Six hundred and ninety-one patients were included. Four hundred and forty-six (65%) and 245 patients (35%) were in the early and late groups, respectively. The initial NIHSS score was similar (early vs. late group, 1.6 $\pm$ 1.1 vs. 1.7 $\pm$ 1.0, p = 0.129). Compared with the early group, the late group had more patients with large artery atherosclerosis (35.1% vs. 23.3%, p = 0.001) and fewer with DAT (33.1% vs. 54.9%, p = 0.000). The two groups had similar rates of recurrent infarction (early vs. late, 6.7% vs. 6.1%, p = 0.758) and long-term favorable outcome (79.8% vs. 80.4%, p = 0.853). Multivariate analyses showed that DAT was an independent predictor of a favorable outcome in both early (OR[95% CI], 1.24[1.03−1.50], p = 0.025) and late (OR[95% CI], 1.42[1.04−1.94], p = 0.027) groups.
Conclusions: DAT is associated with favorable outcomes in both OTDT groups within or beyond 24 hours.
Disclosure of interest: No

1111

Survey on the Management of Covert Brain Infarction – a Call to Care for and Trial this Neglected Population

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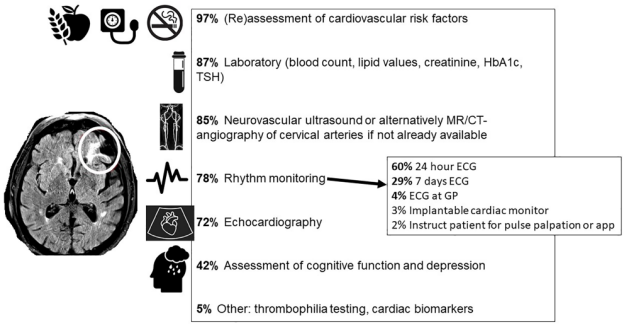
Background and aims: The high prevalence of covert brain infarction(CBI) as well as its link to stroke risk factors and increased mortality and morbidity is firmly established. We sought to gain information on current practice and attitudes towards CBI.
Methods: We conducted a web-based, structured, international survey from November 2021 to February 2022 among neurologists and neuroradiologists. The first part of the survey was designed to capture baseline characteristics and the general approach towards CBI. The second part included two short case scenarios designed to examine management decisions taken upon incidental detection of an embolic-phenotype of CBI versus a small-vessel disease CBI phenotype.
Results: 627 respondents(38% vascular neurologists, 24% general neurologists and 26% neuroradiologists). Most respondents were university hospital senior faculty members with ample experience in stroke. Only 66(18%) of respondents had internal standard operating procedures for the management of CBI available. The majority indicated that they are very uncertain regarding useful investigations and further management of CBI patients(median 67 slider 0-100). Almost all respondents(97%) indicated that they would assess vascular risk factors. Although a majority would do a work-up in analogy to ischemic stroke, there were major diagnostic and therapeutic heterogeneity. Less than half of respondents(42%) would assess cognitive function and depression.
Conclusions: There is a high degree of uncertainty and heterogeneity regarding management of CBI even among experienced stroke physicians. Reliable identification and composing internal standard operating procedures that also address associated symptoms seem promising first steps to overcome management uncertainties and facilitate implementation of consistent care.



Item		Embolic CBI	Small-vessel disease CBI	P
Are further investigations indicated?, yes (%)		284 (91.3%)	237 (79.5%)	<0.001
Investigations (%)				
	12-channel ECG	148 (47.6%)	128 (43.0%)	0.25
	Rhythm monitoring by 24-hours ECG	148 (47.6%)	107 (35.9%)	0.003
	Rhythm monitoring by 7-day ECG	98 (31.5%)	46 (15.4%)	<0.001
	Extended laboratory including lipid profile and HbA1c	204 (65.6%)	195 (65.4%)	0.97
	Transthoracic echocardiography	190 (61.1%)	135 (45.3%)	<0.001
	Transesophageal echocardiography	30 (9.6%)	23 (7.7%)	0.40
	Non-invasive cervical artery angiography	249 (80.1%)	195 (65.4%)	<0.001
	Sleep apnea screening	77 (24.8%)	66 (22.1%)	0.45
	Other	6 (1.9%)	5 (1.7%)	0.82
Blood pressure target, median (IQR)				
	Systolic	130 (130-140)	130 (130-140)	1.0
	Diastolic	80 (80-90)	80 (80-90)	0.9
Approach to cervical artery stenosis if present (%)				<0.001
	Revascularization also if recommendations for primary prevention not fulfilled	89 (29.9%)	34 (12.2%)	

Disclosure of interest: No

1125

INTENSIVE LIPID-LOWERING THERAPY PROTOCOL FOR SECONDARY STROKE PREVENTION: EXPERIENCE FROM A COMPREHENSIVE STROKE CENTRE

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Background and aims: Updated guidelines for secondary ischemic stroke (IS) prevention suggest strict LDL cholesterol (LDLc) targets. The most established LDLc targets are <55 mg/dl for atherothrombotic events and <70 mg/dl for other subtypes. We present our experience in LDLc management in a comprehensive stroke centre.
Methods: Observational, descriptive study of a prospective cohort of patients with TIA or IS admitted to a Stroke Unit between July and October of 2020. Demographic, clinical, laboratory and treatment data were collected both at admission and after 5-month follow-up. Compliance with LDLc goals was assessed.
Results: A total of 152 patients (44.1% women, 70.9 ± 13.9 years old) were included. Forty-two (27.6%) had a TIA, and 110 (72.4%) IS. Thirty were atherothrombotic, 46 cardioembolic and 57 of undetermined source. LDLc levels at admission were 97.1 ± 38.0 mg/dl. Sixty-eight patients (44.7%) were previously under statin treatment (only 6 high-intensity statins and 15 Ezetimibe combinations). Treatment was optimised in 120 patients (78.9%), including every atherothrombotic IS, with 26.7% of high-intensity statins, 50% Ezetimibe combinations, and 1 PCSK9 inhibitor in this group. LDLc was significantly reduced by 31.2 ± 37.9 mg/dl at 5-month follow-up (95% CI=22.9-34.8, p=0.0001). LDLc <70 mg/dl target was achieved in 81.1% of patients, while 83.3% of atherothrombotic events achieved the LDLc <55 mg/dl goal. There was a 5.3% of poor adherence to treatment and 9.8% of adverse effects.
Conclusions: Early use of high-intensity statins and Ezetimibe combinations improved adequacy to LDLc targets. Low discontinuation rates and few adverse effects were observed.
Disclosure of interest: No

1201

VIRTUAL CARDIOVASCULAR LIFESTYLE EDUCATION: A FEASIBILITY STUDY

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Background and aims: The first 5-year cumulative incidence of stroke recurrence ranges from 16-30%. Approximately 50% of recurrent strokes occur within days and weeks of an ischaemic stroke. The aim of this study was to assess the feasibility of a virtual cardiovascular lifestyle education.
Methods: During the COVD-19 pandemic the Cardiovascular Education Centre runs a weekly 1-hour class for 5 weeks via zoom on lifestyle modification. The 5 sessions include: Understanding Stroke; Physical Activity & Exercise; Thinking and Perception after Stroke; Nutrition Workshop; and Understanding Your Medication. Patients were recruited based on a) cognition; b) English speaking; and c) patients discharged home. The study ran for 10 months. The primary outcome measures were full attendance to the 5 sessions, and re-current stroke 3 months from discharge. Patients were interviewed for attendance feedback.
Results: Out of 69 patients invited, only 25 (36%) attended sessions, and more than half (n=14, 56%) completed the 5 sessions. Of the 69, only one patient represented to hospital due to recurrent stroke. Those who attended found the education useful and reported it increased their understanding about stroke and lifestyle modification. The reasons for non-attendance include: a) difficulties operating the computer/ zoom software; b) poor internet connection; c) conflicting health related appointments/ rehabilitation.
Conclusions: Although only a third attended the sessions, the participants found the program useful and improved their awareness to secondary stroke prevention. This supports the feasibility of conducting a research on virtual secondary stroke prevention.
Disclosure of interest: No

1239

Preferences for oral anticoagulant medications for managing atrial fibrillation

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Background and aims: To prevent atrial fibrillation-related secondary stroke in Singapore, it is important for clinicians to better understand patient preferences for anticoagulation medications, particularly between warfarin and direct oral anticoagulants. This study quantified these preferences.
Methods: A Discrete Choice Experiment survey was administered to English-speaking neurology patients who were at least 50 years old. Participants were presented with nine choice tasks and asked to choose between a no treatment option and two hypothetical treatments that varied by six attributes: risk of stroke, risk of bleeding, availability of antidote for bleeding, frequency of blood monitoring, negative interactions with food and drugs, and out-of-pocket treatment costs.
Results: The analysis involved 131 participants. Based on the mixed logit model, the most important attributes were reducing the risk of stroke and out-of-pocket costs while interactions with food was the least important attribute. Using simulations, the predicted use of a new oral anticoagulant was respectively 33% and 15% when the out-of-pocket cost was $10 and $200 per month while it was 58% and 76% for Warfarin with a $10 cost. About 9% of patients preferred not to take any medications regardless of risk, cost, and other factors.
Conclusions: A small but significant percentage of patients (9%) preferred not to use any medications irrespective of treatment features. Offering financial subsidies and providing a better explanation of the benefits of the various available anticoagulants can help increase patient willingness to use these medicines. This can help reduce the incidence of secondary stroke resulting from atrial fibrillation.
Disclosure of interest: No

1301

Inadequate blood pressure, diabetes and lipid assessment and management after ischaemic stroke and TIA; a need to focus on secondary prevention

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Background and aims: Recurrent ischaemic stroke (IS) is a major health burden. Despite improvements in care, stroke recurrence rate is high, ranging from 5.7% to 51.3%; unchanged over the past 20-years.
Methods: A retrospective analysis of medical records, hospital discharge summaries and clinic letters n=305 patients (IS 137; TIA 168) between 1/1/20 and 30/6/20 at a large university hospital in the U.K., to assess secondary prevention measures (management of modifiable risk-factors, advice to GP) was completed.
Results: Key demographics are included in table 1. All IS discharge summaries included blood pressure (BP) and lipid targets to GP, but 80% of IS follow-up clinic letters did not. Only 40% of TIA clinic letters contained BP targets and 42% lipid targets.

1. AF: 98% of IS patients were discharged anticoagulated.
2. Diabetes: 82% baseline HbA1c checked in IS and TIA patients, but repeated by 1-year in 58% of appropriate patients. Only 25% showed improvement.
3. Hyperlipidaemia: baseline lipid-profiles were carried out in 84.5% IS and TIA patients, repeated in 33% of patients. Only 31% of patients achieved the recommended targets.
4. Hypertension: 80 hypertensive IS patients (95%) were discharged on an antihypertensive. No reliable data was available on subsequent BP control at follow-up.

Conclusions: Except for AF, poor risk-factor management is demonstrated in many IS and TIA patients. Considering that 10 modifiable risk-factors account for >90% stroke burden, we recommend improving secondary prevention through clearer GP advice, involving patients in their disease management and development of comprehensive stroke prevention services.

Ischaemic stroke and TIA patients	N (%)
n	305
Age (Q_1-Q_3)	77 (65-84)
Female (%)	155 (50.8)
Hypertension	185 (60.6)
Hypercholesterolaemia	131 (43.0)
Diabetes	54 (18.7)
Atrial Fibrillation*	47 (34.3)
Current or previous smoker*	30 (21.9)

Table 1.

Disclosure of interest: No

1662

The impact of renal function on severity of ischemic stroke with Non-vitamin K antagonist oral anticoagulant: Data from Korean Stroke Registry

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Background and aims: Non-vitamin K antagonist oral anticoagulants (NOACs) are considered as the effective treatment among patients with atrial fibrillation. Concerns have been raised about an efficacy for stroke prevention in patients with creatinine clearance >95 mg/mL treated with edoxaban, one of NOACs. We evaluated the real-world effectiveness of NOACs for stroke severity in atrial fibrillation patients in relation to renal function.

Methods: During the period from January 2016 to October 2021, we identified 2379 NOAC-treated patients prior to index stroke, from the Korean Stroke Registry database. Baseline characteristics and eGFR were compared between mild severity group(NIHSS<8, n=1438) and moderate to severe severity group(NIHSS≥8, n=941).
Results: Patients with moderate to severe stroke severity were older, lower BMI, less likely to have dyslipidemia than the other groups. Compared to patient with eGFR> 90(grade 1 of CKD stage), grade 2 and 4 patients had significantly reduced risk for moderate to severe severity(Grade 2, aOR 0.70, 95%CI 0.56-0.88; Grade 4, aOR 0.47, 95%CI 0.25-0.86). The linear relationship between eGFR(per 10 unit increment) and intial NIHSS was marginally significant(aOR 1.033, 95%CI 1.000-1.066, p for trend =0.050).
Conclusions: In real-world practice, normal to high eGFR was associated with increased risk of moderate to severe stroke. Given the relationship, this study shed light on raising awareness about the importance of adequate doses of NOACs in patients with normal to high renal function.

eGFR (mL/min/1.73m²) Cockroft-Gauld	Mild stroke severity (NIHSS<8) (n=1438)	Moderate to severe stroke severity (NIHSS≥8) (n=941)	p	Unadjusted OR (95% CI)	p	Adjusted OR (95% CI)	p
			0.0006				
≥90	302 (21.0)	236 (25.1)		1(Ref)		1(Ref)	
60-89	713 (49.6)	388 (41.2)		0.70 (0.56-0.86)	0.0008	0.70 (0.56-0.88)	0.0017
30-59	379 (26.4)	295 (31.3)		1.00 (0.79-1.25)	0.9729	0.84 (0.66-1.08)	0.1677
15-29	36 (2.5)	20 (2.1)		0.71 (0.40-1.26)	0.2428	0.47 (0.25-0.86)	0.0140
<15	8 (0.6)	2 (0.2)		0.32 (0.07-1.52)	0.1519	0.18 (0.03-1.05)	0.0569

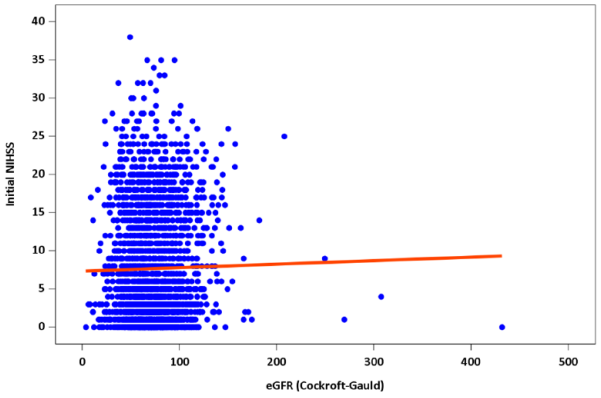

Figure 1. Relationship between eGFR and NIHSS in patients with NOACs.

Disclosure of interest: No

2260

Reduced-Dose Ticagrelor Versus Full-Dose Ticagrelor In Patients With Stroke: A Retrospective Cohort Study

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Background and aims: There has been an increase in use of ticagrelor in patients with ischemic stroke, particularly in the setting of clopidogrel resistance. Our study aims to retrospectively determine if aspirin plus ticagrelor at a reduced dose is effective in reducing the risk of recurrent

stroke and/or other thrombotic events, without increasing the risk of bleeding.

Methods: In a prospectively maintained database, we performed a retrospective analysis of consecutive patients with acute ischemic stroke in a large academic comprehensive stroke center between September 1, 2020 to July 1, 2022. We compared in-hospital mortality, 90-day mortality, favorable functional outcome, defined as a modified Rankin Scale (mRS) score of 0 to 2, at 90 days, symptomatic intracranial hemorrhage (sICH), and asymptomatic intracranial hemorrhage (ICH), between patients on reduced-dose ticagrelor versus those on full-dose ticagrelor, in unadjusted and adjusted logistic regression models.

Results: We included 567 patients in our study. A total of 60 patients were on a reduced dose of ticagrelor (45 mg or 60 mg twice daily). The remaining 39 patients were on 90 mg twice daily dosing. New or recurrent ischemic stroke was similar across both groups (10% vs. 18%, p=0.36). Symptomatic ICH was also found to be similar across both groups (3.6% vs. 2.9%, p=1.00).

Conclusions: Our study demonstrates that there was no statistically significant difference in favorable functional outcomes, recurrence of stroke, or mortality in patients on reduced dose ticagrelor compared with patients with regular dose ticagrelor.

Table 1. Baseline characteristics of patients by ticagrelor dose

Variable	Reduced dose ticagrelor (n=60)	Full dose ticagrelor (n=39)	p-value[a]
Age (mean, SD)	65.8, 11.3	62.59, 14.3	0.22
Sex			
Male	23 (38.3%)	20 (51.3%)	0.20
Female	37 (61.7%)	19 (48.7%)	
Race			0.57
Black	50 (83.3%	34 (89.5%)	
White	7 (11.7%)	4 (10.5%)	
Asian	2 (3.3%)	0 (0.0%)	
More than one race	1 (1.7%)	0 (0.0%)	
Hypertension	48 (80.0%)	31 (79.5%)	0.95
Dyslipidemia	28 (46.7%)	17 (43.6%)	0.76
Diabetes mellitus	22 (36.7%)	19 (48.7%)	0.23
Prior stroke/TIA	21 (35.0%)	18 (46.2%)	0.27
Current or former smoker	16 (28.1%)	11 (29.0%)	0.93
Coronary artery disease	8 (13.3)	11 (28.2)	0.07
Atrial fibrillation	2 (3.3%)	2 (5.1%)	0.66
Qualifying event			
Stroke/TIA	52 (86.7%)	35 (89.7%)	0.65
Intracranial atherosclerotic disease	21 (35.0%)	18 (46.2%)	0.27
Stent placement	20 (33.3%)	5 (12.8%)	0.03
NIHSS score on presentation			0.59
≤ 3	20 (33.3%)	11 (28.2%)	
> 3	40 (66.7%)	28 (71.8%)	
Infarct size, mL (mean, SD)	7.5, 2.3	16.3, 9.2	0.28
Intravenous thrombolysis	6 (10.0%)	2 (5.1%)	0.47
Endovascular thrombectomy	20 (33.3%)	6 (15.4%)	0.05

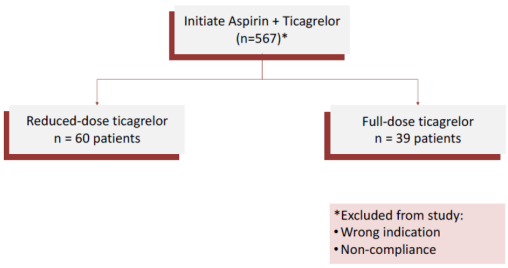
[a]p-value <0.05 is considered statistically significant

Table 2. Outcomes by ticagrelor dose status

Variable	Reduced dose ticagrelor (n=60)	Full dose ticagrelor (n=39)	p-value[a]
Primary outcome			
Favorable functional outcome[b]	16 (26.7%)	9 (23.1%)	0.69
New or recurrent stroke	6 (10.0%)	7 (18.0%)	0.36
Mortality	5 (8.3%)	1 (2.6%)	0.40
Safety outcome			
Symptomatic intracranial hemorrhage	2 (3.6%)	1 (2.9%)	1.00
Stent thrombosis	1 (7.1%)	0 (0.0%)	1.00
Major extracranial bleeding	1 (1.8%)	0 (0.0%)	1.00
Gastrointestinal bleeding	0 (0.0%)	1 (2.9%)	0.38

[a]p-value <0.05 is considered statistically significant
[b]Favorable functional outcome is determined by a score of less than or equal to 2 on the modified Rankin Scale

Figure 1. *CONSORT diagram showing inclusion, exclusion methods and sample collection*



Disclosure of interest: No

2523

Long-term mortality and follow-up after carotid artery stenting

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Background and aims: Background: Carotid artery stenting (CAS) has been established as a minimally invasive alternative to endarterectomy for patients with significant extracranial carotid occlusive disease .The high long-term mortality among patients who underwent CAS seems to be related to the high comorbidity burden.

Aim: We sought to investigate the very long-term survival after CAS and the impact of comorbidities on mortality at follow-up.

Methods: Data of 290 symptomatic and asymptomatic patients who underwent CAS with cerebral protection systems from November 2000 to December 2012 were analyzed. All cause mortality during long-term follow-up was assessed. Univariate and multivariate Cox regression analysis was used to find independent predictors of death.

Results: The median age of patients was 68.2 (44-86) years and 78.9 % of patients were male. The median follow-up was 7.6 (IQR: 4.4-10.2) years. The all-cause mortality rate after 30 days and at maximum follow-up was 0,34 %, and 45.5 %, respectively. Out of 132 deaths, 67 (50,7 %) were cardio-cerebral vascular related deaths, 55 (41.6 %) non-cardiovascular deaths, and 10 (7.57 %) due to unknown reasons. Among cardio-cerebral vascular deaths, there were 31 fatal strokes, (20 ischemic and 11 hemorrhagic), 27 fatal myocardial infarctions and 9 other vascular related deaths. Non-cardiac deaths were due mainly to cancer (32/55). Age and diabetes mellitus were independent predictors of all-cause death during long-term follow-up

Conclusions: Long-term follow-up showed a low rate of mortality. Age and diabetes mellitus were independent predictors of all-cause death.

Disclosure of interest: No

REHABILITATION – EXCLUDING CLINICAL TRIAL RESULTS

1369

Individual peer support for stroke survivors – participatory action research to codesign an peer helper intervention

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Background and aims: Due to the brutality of stroke and increasingly shorter in-hospital lengths of stay, patients and their families must adapt quickly after acute stroke to the patient's new health functioning and the new caregiving role for family members. Peer support, ie support of patient by another patient who previously experienced the same situation, could be an innovative approach to address these issues. We aim to codesign a peer-helper intervention to support patients discharge and improve their community reintegration after stroke.
Methods: A participatory action research was conducted following Bandura's social learning theory and based on the results of a previous needs assessment study. For this, 3 workshops lasting 2h30 were conducted. Participants were patients and health professionals working with stroke survivors. In order to develop the profile of the peer helper, a qualitative analysis was conducted iteratively based on participant observation and workshops vocal recordings. The workshop guide was adapted between every workshop.
Results: We recruited 8 participants: 3 patients, a rehabilitation physician, a social worker, a physiotherapist, 2 occupational therapists. During the first workshop, patients reported psychosocial and informational needs after discharge and proposed tasks and positioning of a peer helper. During the following two workshops, patients and health professionals defined the skills, tasks, tools, training and supervision of the peer-helper. Barriers and facilitators to implement peer-helper intervention were identified.
Conclusions: We developed, with a participatory approach, our peer support intervention by defining the status, profile, training, activity and interactions with patients.
Disclosure of interest: No

1508

Urinary Retention in Persons with Stroke: Vesical Reeducation Protocol

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Background and aims: Urinary Tract Infections are responsible for more than 30% of infections and are the fifth most common type of nosocomial infection. In healthcare facilities, most are caused by instrumentation of the urinary tract, through bladder catheterization. The existence of a standardized procedure in the management of bladder catheterization is assumed as a necessary tool for the improvement of clinical practice. The aim of this study is to implement a bladder reeducation protocol.
Methods: From 97 patients were admitted to the stroke unit (September 2021 to January 2022), 12 were eligible for this study (inclusion criteria: patients with catheterization at admission or who during hospitalization had an episode of urinary retention; exclusion criteria: chronic catheterization and urinary incontinence). The protocol implemented consists of three phases: clinical decision algorithm, prompted voiding and pelvic floor reeducation through Kegel exercises.
Results: The incidence of bladder catheterization was reduced to 12.4%. Stroke unit nurses were responsible for 25% of bladder catheterization compared with 45.8% from the previous data (2020), before the protocol. As for the incidence of post-catheter infection, there was also a reduction, from 44% (2020) to 33.3%. A decrease in time was observed, in which 41.7% of patients were catheterized for 1-7 days, in contrast to 69.5% (2020).
Conclusions: The implementation of the protocol demonstrated that the interventions contributed to functional gains in urinary elimination and prevented the resurgence of new episodes of urinary retention. More research is needed to show the overall gains among stroke patients.
Disclosure of interest: No

1707

Acquired brain injury specific day care centers and the evolution of balance in post stroke patients

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Background and aims: Balance recovery is one of the main issues in patients after a stroke. Specific acquired brain injury day care centers could be a very useful tool in the rehabilitation of balance through individual, group sessions and training of activities of the daily living.
Methods: We conducted a retrospective study from 2014 to 2023 to see the evolution of the Berg balance scale data from our day care center patients that suffered a stroke. We reviewed the data of 45 patients selecting only those that suffered a stroke and had an initial Berg balance scale and another one after at least 6 months in the daycare center. After the selection process 10 patients were included in the study.
Results: 10 patients had results from the Berg Balance scale at their entry to the day care center and afterwards with at least 6 months of evolution between tests. There was an overall increase of 13,75% in the Berg Balance scale of the patients included in the study.
Conclusions: Balance recovery is one of the most challenging aspects in order to discharge patients from rehabilitation and send them home. Specific acquired brain injury day care centers were balance programs, individual rehabilitation and activities of the daily living are trained, could improve balance in stroke patients and allow them to return home with less risk to fall.
Disclosure of interest: No

2406

PHARMACOTHERAPY REVIEW IN EARLY MOTOR REHABILITATION AFTER ISCHEMIC STROKE

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Background and aims: Several drugs have been used off label to enhance early motor rehabilitation after ischemic Stroke with controversial results. The objective is to review the current evidence of the most used drugs in clinical practice
Methods: A literature search of the following databases was done: the Cochrane Library, PubMed, and Epistemonikos to June-August 2022 22, The studies include patients who underwent early (7 days to 6 months) motor rehabilitation after acute ischemic stroke. The selected pharmacological interventions were cerebrolysin, amphetamines, antidepressants, GABA agonist, l-dopa, seleginine, memantine, donepecil, lamotrigine,

neuroleptics. The outcomes were early motor performance, independence, language skills and adverse events.
For each PICO question we considered: risk of bias; inconsistency; indirect evidence, imprecision of results. Synthesis and evaluation of the evidence were carried out using the GRADE methodology. At time of abstract submission, we have only analyzed cerebrolisin.
Results: For cerebrolisin analysis, we included one meta-analisys, two systematic reviews and one clinical trial, some of low and moderate quality of evidence.
The outcomes were measured by ARAT scale, NIHSS, Barthel index, modified Rankin and adverse events. The OR of improvement calculated by Action Research Arm Test (ARAT), and NIHSS were OR 2.12 (95% CI 0.68–6.59) and OR 3.67 (95% CI 1.89–7.13) at 3 months respectively.
Conclusions: Cerebrolysin (30 ml, intravenous day, minimum 10 days) could improve early motor neurorehabilitation after moderate–severe ischemic stroke
Disclosure of interest: Yes

2607

Use of 31-Phosphorous Magnetic Resonance Spectroscopy in Muscle Function and Post Stroke Fatigue

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Background and aims: Impaired cellular bioenergetic potential of skeletal muscle may contribute to post stroke fatigue (PSF). This study explored the use of 31-Phosphorous magnetic resonance spectroscopy (31-P MRS) to detect differences in muscle adenosine triphosphate (ATP) in affected and non-affected limbs in people with stroke, and to correlate them with fatigue and parameters of muscle function.
Methods: Patients with hemiplegia PSF (fatigue severity score FSS-7 $>$ 4) were recruited to undergo: 6 minute walk test (6MWT); maximal voluntary contraction of tibialis anterior (MVCta, Kg) using a fixed myometry (Aeverl Medical) and pulley system; resting 31-P MRS scanning of tibialis anterior muscles on the affected and unaffected side conducted at 3 Telsa (3T) (Philips Healthcare) using a transmit-receive 31P surface coil. Spectroscopic data processing focused on ATP, the main energy currency of the cell. Mann-whitney U was used to test statistical differences in ATP content, and simple scatter plots and Pearson r correlation was used to explore correlations between variables.

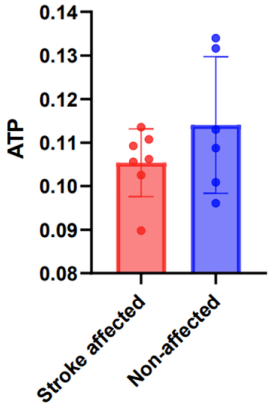

Figure 1. Resting ATP in the tibialis anterior of the stroke affected (red) and non-affected (blue) legs.

Results: Eight patients (5 male) with PSF, mean (SD) age 61.2 (6.3) were recruited (mean 33 months post stroke, 87.5% ischaemic stroke). Mean muscle ATP content appeared lower in affected limbs compared to non-affected (figure 1), albeit not statistically so (p=0.14). Muscle ATP was inversely correlated with FSS-7 (R= -0.68; p=0.09), and positively correlated with 6MWT (R= 0.85; p=0.02) and MVCta (R=0.59; p=0.16) in the affected limbs.
Conclusions: 31-P MRS may be a promising biomarker in the investigation of muscle function and fatigue after stroke.
Disclosure of interest: No

EPIDEMIOLOGY AND RISK FACTORS

23

The Correlation between the Incidence of Ischaemic Strokes and Air Pollution data in Ludwigshafen During the Years 2018 and 2019

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Background and aims: Several studies have suggested that the exposition to air pollutants such as $PM_{2,5}$, PM_{10}, NO, NO_2, CO, O_3, and SO_2 may be an independent risk factor for ischaemic strokes. We studied the association between air pollution data and stroke occurrence in an industrial city in Southwest Germany. We studied the association between air pollution data and stroke occurrence in an industrial city in Southwest Germany.
Methods: In 2018 and 2019, 861 ischaemic stroke patients with a regular residence in Ludwigshafen, consecutively admitted to the Klinikum Ludwigshafen, a regional centre for acute stroke management, were retrospectively analysed. The hourly measured concentrations of the air pollutants mentioned above, provided by the Federal Environment Agency, were collected and their daily average values calculated. The predictive value of the concentration of each pollutant, both on the day of the incidence and on the previous two days, was tested using poisson regression models.
Results: There was no significant correlation between the average daily concentration of any of the pollutants and the incidence of ischaemic strokes. Considering the concentrations on the two days prior to the stroke incidence, PM_{10} was a significant predictor (z=2,04, p=0,041) and $PM_{2,5}$ showed a significant negative correlation (z=- 2,71, p=0,007).
Conclusions: In our study, the average daily concentrations of $PM_{2,5}$, PM_{10}, NO, NO_2, CO, O_3, and SO_2 did not correlate with the daily incidence of ischaemic strokes, nor was there a correlation with the incidence on the following day.
Acknowledgments: Dr. re. nat. Marius Keute, University of Tuebingen.
Disclosure of interest: No

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Long sleep duration and dissatisfaction with sleep quality are associated with ischemic stroke in young patients

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Background and aims: Suboptimal sleep duration and poor sleep quality have been proposed to increase stroke risk. However, their significance in young ischemic stroke is unclear. We aimed to investigate the importance of sleep duration and quality on young ischemic stroke patients.
Methods: A multicenter matched case-control study was performed to evaluate under-recognized risk factors in young ($<$45 years) ischemic

stroke patients in 8 tertiary hospitals in Korea. A total of 225 patients and 225 age- and sex-matched controls were enrolled in the same period. Detailed information about patients' demographics, socioeconomic state, traditional and nontraditional risk factors including sleep-related factors were obtained using structured questionnaires. Risk of ischemic stroke were estimated using conditional logistic regression analysis.

Results: Although average sleep duration was similar in patients and controls, patients were more likely to have long (⩾ 9 hours) or extremely short (< 5 hours) sleep durations. In addition, the proportion of subjects with dissatisfaction with sleep quality was higher in patients than controls (66.2% versus 49.3%, $p < 0.001$). In multivariable conditional logistic regression analysis, long sleep duration (OR: 11.076, 95% CI: 1.819-67.446, $p = 0.009$) and dissatisfaction with sleep quality (OR: 2.116, 95% CI: 1.168-3.833, $p = 0.013$) were independently associated with risk of ischemic stroke.

Conclusions: Long sleep duration and dissatisfaction with sleep quality may be associated with increased risk of ischemic stroke in young adults. Improving sleep habit or quality could be important for reducing the risk of ischemic stroke.

Disclosure of interest: No

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ASSOCIATION BETWEEN HEAVY ALCOHOL CONSUMPTION AND CRYPTOGENIC ISCHEMIC STROKE IN YOUNG ADULTS

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Background and aims: Underlying risk factors for young-onset cryptogenic ischemic stroke (CIS) remain unclear. We aimed to explore the association between heavy alcohol consumption and CIS, stratified by sex and age groups.

Methods: We prospectively enrolled 509 patients aged 18-49 years (median age 41 years; 47% women) with a recent CIS and 509 age- and sex-matched (±5 years) stroke-free controls. Adaptation of the World Health Organization Alcohol, Smoking and Substance Involvement Screening Test was used to assess alcohol consumption. Heavy consumption was defined as at least an average of two times per month ⩾5 (women) and ⩾7 (men) doses of alcohol per time (binge drinking) or ⩾7 and ⩾14 doses per week, respectively. We used conditional logistic regression adjusting for age, education, hypertension, diabetes, current smoking, obesity, and physical inactivity to assess independent association between heavy alcohol consumption and CIS.

Results: Patients had more frequently history of hypertension compared to controls, and they were more often current smokers, overweight, physically inactive, and heavy alcohol users. In the entire cohort, heavy alcohol consumption was independently associated with CIS (adjusted odds ratio [aOR] 2.35, 95% confidence interval [CI] 1.34-4.08). In sex- and age-specific analyses, alcohol consumption was associated with CIS especially in younger men aged <41 years (aOR 8.70, 95% CI 2.30-32.9) but not in other subgroups. When exploring the association with binge drinking alone, the results remained nearly unchanged.

Conclusions: Heavy alcohol consumption, especially binge drinking, appears to be an independent player in CIS of younger men.

Disclosure of interest: No

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CHARACTERISTICS, RISK FACTORS AND OUTCOMES OF MINOR ACUTE ISCHEMIC STROKE PATIENTS: DATA FROM A STROKE CENTER IN VIETNAM

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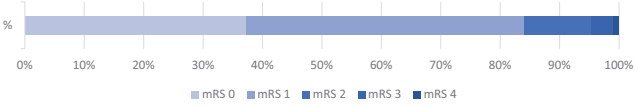
Background and aims: Minor stroke (defined by the NIHSS score <5) is a major subset of acute ischemic stroke patients. Although the majority of these patients recover well, the others can get unfavorable outcomes. This study aimed to figure out characteristics, risk factors, and outcomes of minor acute ischemic stroke patients admitted to the Stroke center of Bachmai hospital.

Methods: A cross-sectional descriptive study that enrolled minor AIS patients was conducted at Bachmai stroke center from June 2021 to May 2022. The selected patients had NIHSS scores <5 points and were admitted to the hospital within 24 hours from onset. The primary outcome was the excellent recovery rate (mRS 0-1) after 90 days.

Results: 300 patients (mean age: 64.25 ± 11.49; males: 69.7%) were recruited. 15 (5.0%) patients were under 45 years of age. The main risk factors included hypertension (57.3%), dyslipidemia (54.3%), and diabetes mellitus (22.0%). According to the TOAST classification, small vessel occlusion accounted for the highest rate (35.7%), followed by large-artery atherosclerosis (27.7%) and cardioembolism (4.0%). Stroke of undetermined etiology was 32.6%. 19 (6.3%) patients received thrombolysis therapy and 1 (0.3%) patient underwent thrombectomy due to disabling stroke symptoms or deterioration. After 90 days, excellent recovery (mRS 0-1) was seen in 252 (84.0%) patients. There were 14 (4.7%) patients with unfavorable outcomes (mRS 3-4).

Conclusions: This study showed some distinct characteristics of minor acute ischemic stroke patients at Bachmai stroke center. A high rate of excellent recovery was seen in this study.



Disclosure of interest: No

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RISK FACTORS, PRESENTATION AND OUTCOME IN ACUTE STROKE ACCORDING TO SOCIAL POSITION INDICATORS IN PATIENTS HOSPITALISED IN A REFERRAL CENTRE IN BOGOTÁ 2011-2019

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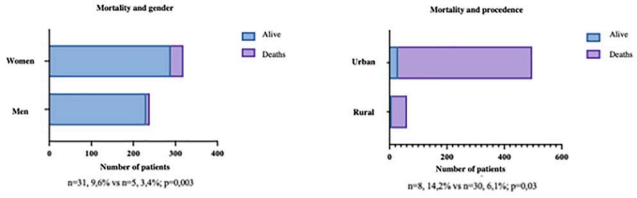
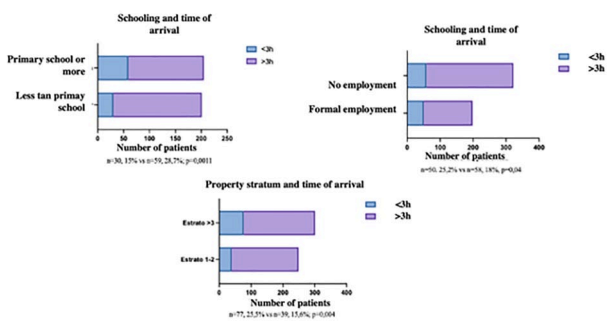
Background and aims: As stroke treatment is time-dependent, it challenges the social and demographic context of patients for timely consultation and effective access to reperfusion therapies. The aim is to relate indicators of social position to cardiovascular risk factors, time of arrival, access to reperfusion therapy and mortality in the setting of acute stroke.
Methods: A retrospective analysis of patients with a diagnosis of ischaemic stroke in a referral hospital in Bogotá was performed. Patients were characterised according to indicators of social position, time of arrival after stroke, reperfusion therapy and mortality
Results: 558 patients were included with a slight predominance of women. Mortality was higher in rural patients (n=8, 14.2% vs n=30, 6.1%; p=0.03). Lower schooling was associated with late consultation (n=30, 15% vs n=59, 28.7%; p=0.0011) and lower probability of accessing reperfusion therapy (n=12, 6% vs n=45, 22%; p=<0.0001). Formal employment was associated with a visit to the emergency department in less than 3 hours (n=50, 25.2% vs n=58, 18%, p=0.04 and a higher probability of accessing reperfusion therapy (n=35, 17.6% vs n=33, 10.2%; p=0.01). Living in a property with a stratum higher than 3 was associated with early arrival (n=77, 25.5% vs n=39, 15.6%; p=0.004) and reperfusion therapy (n=57, 18.9% vs n=13, 5.2%; p= <0.0001).
Conclusions: Indicators of socioeconomic status are related to mortality, consultation time and access to reperfusion therapy. Mortality and reperfusion therapy are inequitably distributed and, therefore, require public policies to reduce the access gap in the context of acute stroke in Bogotá.

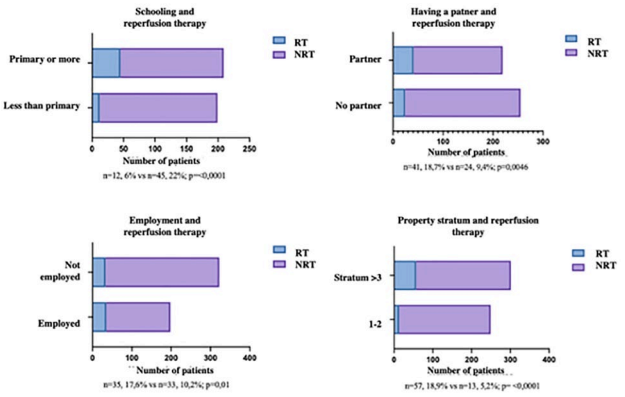
Graph 1. Social position factors related to mortality



Graph 2. Social position factors related to early arrival to the hospital



Graph 3. Social position factors related to reperfussion therapy



Disclosure of interest: No

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SEVERE LUPUS FLARE CONTRIBUTES TO A MUCH HIGHER RISK OF STROKE AMONG PATIENTS WITH SYSTEMIC LUPUS ERYTHEMATOSUS

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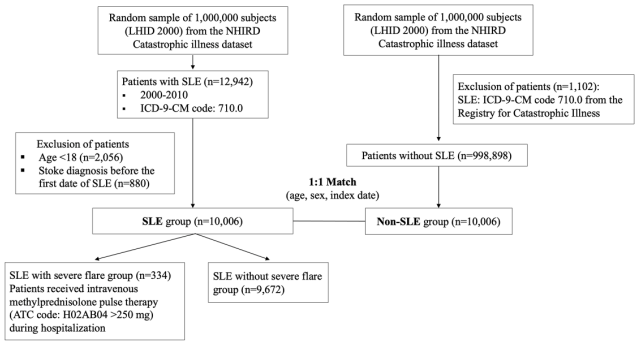
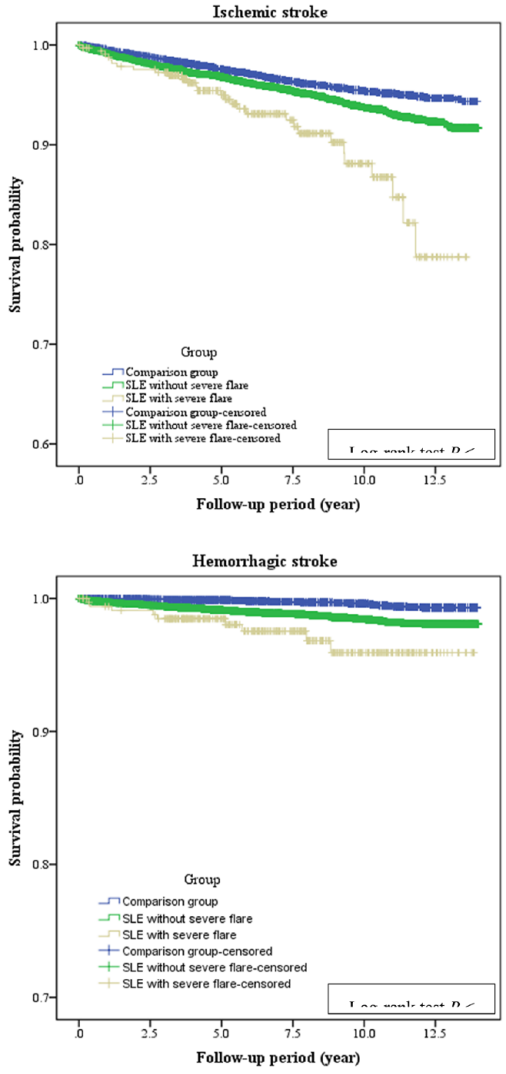
Background and aims: There are few data on the influence of lupus flare on stroke risk in systemic lupus erythematosus (SLE). In this study, we aimed to investigate whether severe lupus flare further increases the risk of stroke among SLE patients.
Methods: Using the Taiwan National Health Insurance Research Database, we conducted a retrospective population-based cohort study from 2000 to 2016. Each patient with SLE was matched to a non-SLE subject in age, sex, and index date. A severe flare of lupus was identified when an SLE patient was admitted for pulse therapy with intravenous methylprednisolone greater than 250 mg in a single hospitalization. SLE patients were divided into severe flare and non-severe flare groups.
Results: In total, 334 of 10,006 patients with SLE had severe lupus flare, and the remaining 9,672 patients were assigned to the non-severe flare group. Ischemic stroke occurred in 29 (8.7%), 485 (5%), and 384 (3.8%) of the patients in the severe flare, non-severe flare, and control groups, respectively. Hemorrhagic stroke occurred in 9 (2.7%), 123 (1.3%), and 37 (0.4%) of patients in the severe flare, non-severe flare, and control groups, respectively. Compared to patients in the non-severe flare group, patients

Figure 1. Flow chart of patient selection



with severe flare had a significantly higher risk of ischemic stroke (aHR= 7.44, 95% CI: 4.93-11.25 versus aHR= 1.52, 95% CI: 1.26-1.83) and hemorrhagic stroke (aHR= 22.49, 95% CI: 10.09-50.12 versus aHR= 4.47, 95% CI: 2.90-6.90).
Conclusions: Severe lupus flare leads to a much higher risk of ischemic and hemorrhagic stroke among SLE patients.

Figure 2. Analysis of the development of stroke in patients with or without systemic lupus erythematosus



Disclosure of interest: No

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SERUM CREATININE LEVELS IN YOUNG PATIENTS WITH INTRACEREBRAL HAEMORRHAGE

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Background and aims: Generally, a disease of the elderly, the incidence of SICH in the young is showing an increasing trend especially in the Indian subcontinent. An attempt is made to analyse factors which may predict the risk of SICH in young-onset hypertension.
Methods: A case control retrospective study comprising of patients less than 50 years with intracerebral haemorrhage on CT scan within 6 hours of ictus between January 2015 and December 2020 was done. Patients with prior CKD, on anticoagulants were excluded. A control group with no previous history of hypertension who underwent elective neurosurgical procedures were matched to age and sex. Serum creatinine on admission day was analysed.
Results: A total of 302 patients fulfilled the inclusion criteria from a total of 1890 patients who were admitted with SICH during the same period. The control was matched 1:1 to age and sex from a pool of 602 patients. Mean age of patients with SICH was 42.91±6.06 and control group was 42.72±5.89 years. There were 71 females and 231 males in both groups. In the SICH group 210 patients (69.5%) had evidence of left ventricular hypertrophy (LVH). Serum creatinine levels in the SICH group was 0.96±0.28 vs 0.8±0.27 mg/dL in the control group ($p<0.001$). Serum creatinine levels were also significantly higher in patients with LVH (0.98±0.28 vs 0.90±0.27 mg/dL) p=0.031
Conclusions: There is a significant difference in serum creatinine levels in young hypertensive patients with SICH suggesting end organ damage before the occurrence of intracerebral haemorrhage.
Disclosure of interest: No

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Longitudinal changes of CKD in acute stroke patients, and association with stroke type

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Background and aims: Chronic kidney disease (CKD) is known to be a risk factor for stroke. We investigated CKD complications and material changes in acute stroke.
Methods: The participants were 24,392 acute stroke patients who had been hospitalized within 7 days of onset, as registered in database between 2013 and 2021. We extracted the type of stroke, CKD, risk factors, and prognosis. The period from 2013 to 2021 was divided into three periods: early, middle, and late. The relationships between the stroke types, risk factors, prognosis (mRS), and longitudinal changes were analyzed.
Results: The stroke types were cerebral infarction(CI) in 15,479 cases, cerebral hemorrhage in 6,218 cases, subarachnoid hemorrhage in 1,640 cases. CI with CKD significantly increased over the years. This disorder constituted 9.7% in the early, 11.2% in the middle, and 14.8% in the late, $p<0.01$. In all the types of CI, CKD increased significantly over time. This was especially associated with cardiogenic embolisms. The latter were enumerated as 13.8% in the early, 16.8% in the middle, and 23.2% in the late, $p<0.01$. Each type of CI developed over the years, especially cardiogenic embolisms. The prognosis was significantly worse in patients with CKD and similar in all types of stroke. The prognosis for CKD cases was also poor in all types of CI.
Conclusions: Acute stroke with CKD are increasing, especially those with cardiogenic embolisms requiring anticoagulant therapy. It is considered that caution should be exercised when attempts are made to prevent the recurrence of cerebral infarctions.
Disclosure of interest: No

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Clinical and epidemiological characteristics of stroke in Uzbekistan during the COVID-19 pandemic according to the stroke registry

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Background and aims: Get reliable data on the main epidemiological indicator of stroke in Uzbekistan during the COVID-19 pandemic according to the stroke registry.
Methods: The stroke registry during the COVID-19 pandemic was carried out using a population-territorial method according to the questionnaire of the national stroke registry for patients over 18 years of age. All new and repeated cases of cerebral stroke that developed during the observation period among permanent residents of the Republic of Uzbekistan and all cases of death from cerebral stroke were recorded.
Results: During the COVID-19 pandemic, 36,975 stroke patients were identified in the Republic of Uzbekistan.The average incidence of stroke was 1.1 per 1000 population. Mortality was - 0.38 per 1000 population and mortality - about 35.4%. Cerebral strokes begin to occur from the age of 42. With age, the proportion of cerebral strokes increases. Among all cases of cerebral strokes, 3.7% occur in the young (18-44 years old), 36.3% in the middle (45-59 years old), 38.4% in the elderly (60-74 years old), 21.6% in senile (75-90 years) age group. An analysis of cases of cerebral strokes depending on the nature of cerebrovascular accident showed that Ischemic 59.4%, Hemorrhagic 10.8% of patients, Transient ischemic attack 29.6% of patients.
Conclusions: The revealed data show that the frequency of stroke during the pandemic decreased by half compared to previous years, which is most likely due to the treatment of patients with stroke at home, without registration in medical institutions, for fear of infection with COVID-19
Disclosure of interest: No

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Epidemiology and clinical characteristics of stroke in young Egyptian adults

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Background and aims: Stroke in young patients result in disproportionately high social cost given the productive life years lost. Little is known about stroke in young Egyptian patients. Hereby we aim to present the clinicodemographic characteristics of Egyptian young adults with acute ischemic stroke (AIS).
Methods: Prospective, observational cohort study of consecutive patients with AIS aged$\leqslant$50 years, recruited between January 2020-January 2021 at Assiut University hospitals, the largest tertiary stroke center in the south of Egypt. We recorded baseline demographic and cardiovascular risk factors, stroke severity, stroke subtype according to the TOAST classification, intravenous thrombolysis, and hospital mortality.
Results: Our cohort comprised 136 patients, 38.7 ($\pm$7.5) years; 71 (52%) females. Mean NIHSS score was 11.9($\pm$4.7); 9(7%) patients died in-hospital. Dyslipidemia (38%), smoking (35%), and atrial fibrillation (32%) were the most prevalent cardiovascular risk factors. Cardioembolism (29%) was the commonest and small vessel disease (15%) the least common etiologic subtype. Using a NIHSS cutoff of $\geqslant$5, 128/134 (96%) of patients were eligible for thrombolysis; 22 (16%) received it. There were no significant differences in age, cardiovascular risk factor, prevalence or stroke subtype between those who received thrombolysis versus those who did not.
Conclusions: Young adult AIS patients in Egypt experience an unusually high rate of cardioembolic stroke and have a high prevalence of treatable cardiovascular risk factors. Only a small fraction of thrombolysis-eligible patients receives it. Our findings suggest that both primary prevention and acute management present attractive targets for young adults with stroke with potential societal benefit
Disclosure of interest: No

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EPIDEMIOLOGY AND CHARACTERISTICS OF ENDOVASCULAR TREATMENT IN ISCHAEMIC STROKE AMONG YOUNG ADULTS. EXPERIENCE IN A NEUROINTERVENTIONAL CENTER

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Background and aims: Stroke in young adults (aged from 18-50 years) represents a growing problem with a diverse underlying pathogenesis. For that reason, we decided to analyse the characteristics of this group of patients in our tertiary hospital.
Methods: Retrospective study of young adults with ischaemic stroke who underwent mechanical thrombectomy (MT) between May2016-June2022. Demographic, clinical, radiological and prognostic variables were analysed.
Results: 82 patients (47,6% women and 52,4% men) with a mean age of 46$\pm$4.5 years were included. Most common cardiovascular risk factors were: smoking (53,6%), high blood pressure (30,5%), dyslipidemia (23,2%) and diabetes (8,5%). All of them more prevalent in $>$35 years, with a statistically significant higher frequency of dyslipidemia among men. Main causes of stroke were: atherothrombotic (11,1%), cardioembolic (13,6%), undetermined (48,1%; mainly in $>$35 years) or unusual cause (27,2%; mainly in $<$35 years and associated to carotid artery dissection). 37% of the strokes were of unknown onset with a median initial NIHSS of 18 and ASPECTS of 8. Intravenous fibrinolysis plus MT was indicated in 46,2% patients. Successful recanalization (TICI$\geqslant$2B) was achieved in 92,2%. Most common complications were: haemorrhagic transformation(22,5%), pneumonia(15%), malignant infarction(12,3%) and 9 deaths. Median NIHSS at discharge was 4, reaching a mRs$\leqslant$2 at 90 days in 56,5% of the patients.
Conclusions: Stroke in young adults represents an entity with broad etiologies and severe functional consequences. High diagnostic suspicion and early treatment would lead to a decrease in the number of years of healthy life lost due to disability.
Disclosure of interest: No

1187

Define the Age of Young Ischemic Stroke Using Data-Driven Approaches

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Background and aims: The cut-point for defining the age of young ischemic stroke(IS) is clinically and epidemiologically important, yet it is arbitrary and differs in studies. In this study, we leveraged electronic health records(EHR) and data-science techniques to estimate an optimal cut-point for defining the age of young IS.

Methods: Patient-level EHR were extracted from 13 hospitals in Pennsylvania and used in two parallel approaches. The first approach included ICD9/10, from IS patients to group comorbidities and computed similarity scores between every patient pair. The second approach used the IS cohort and control (without IS) and built three sets of machine learning models –Generalized Linear Regression(GLM), Random Forest(RF), and XGBoost(XGB)– to classify patients by analyzing the pattern of comorbidity in seventeen age groups. Both approaches were completed separately for male and female patients.
Results: The stroke cohort contained 7,555 IS and the control included 31,067 patients. In the first approach, the optimal age of young stroke was 53.7 and 51.0 years in female and male patients, respectively. In the second approach, we created 102 models – based on 3 algorithms, 17 age brackets, and 2 sex. The optimal age was 53(GLM), 52(RF), and 54(XGB) for female, and 52(GLM & RF) and 53(RF) for male patients. Different age and sex groups exhibited different comorbidity patterns.
Conclusions: Using a data-driven approach, we determined the age of young stroke to be 54 years for women and 52 years for men in our central Pennsylvania population. Future validation studies should include more diverse populations.
Disclosure of interest: No

1261

Physical activity behaviour and its association with global cognitive function three months after stroke: A Nor-COAST sub-study

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Background and aims: More research is needed to investigate the mechanisms behind stroke survivors' varying engagement in physical activity (PA). Therefore, we aimed 1) to explore PA behaviour three months post-stroke; and 2) to determine its association with global cognitive function and the role of physical function as mediating factor.
Methods: Patients suffering acute stroke were recruited at five hospitals in Norway and assessed three months post-stroke. Duration and intensities of PA and adherence to WHO's PA recommendations were measured using activPAL accelerometers (seven-day follow-up). Global cognitive function and physical function were assessed using Montreal Cognitive Assessment (MoCA) and Short Physical Performance Battery (SPPB), respectively. Multiple regression and mediator analyses, adjusted for age, sex and education, were conducted to examine the relationship between PA behaviour (dependent variables) and MoCA score.
Results: A total of 453 participants with a median (25^{th},75^{th} percentile) age of 73.7 years (65.8, 80.4) were included. While none of them reached vigorous intensities (⩾6 Metabolic Equivalent of Task, METs), the mean time walking at moderate intensity (⩾3 to <6 METs) was 251.7 (SD=164.6) min/week (mean bout length=20.9 seconds; SD=7.3). About 69% of participants adhered to the WHO's PA recommendations. With each point decrease in MoCA score, there was an 8.6% increase in odds of non-adherence to PA recommendations. SPPB score was identified as a mediating factor.
Conclusions: Stroke survivors with reduced global cognitive function are at higher risk of inactivity. Physical function contributes significantly to explain the association between cognition and PA behaviour.
Disclosure of interest: No

1278

A machine learning approach to predict high-level fatigue post-stroke

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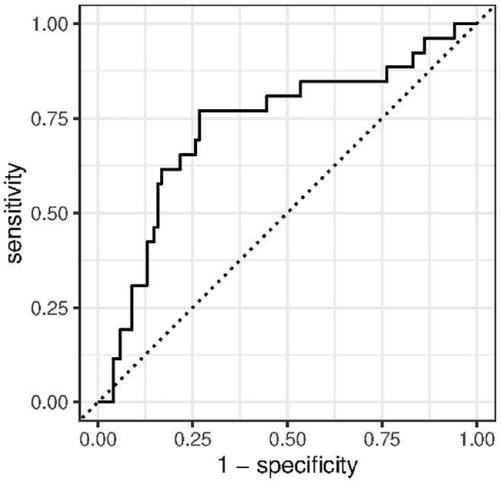
Background and aims: The nature of post-stroke-fatigue is complex. Advanced statistics may be useful in identifying people at risk. This study aimed to apply a machine-learning approach in predicting high-level fatigue 18 months post-stroke by utilizing comprehensive data from the acute and sub-acute phase.
Methods: In total, 45 prediction variables were collected in the prospective multicentre Nor-COAST study, at initial hospital-stay and three months later, including physical functioning, physical activity, cognitive function, and emotional health. Fatigue served both as predictor and outcome variable and was assessed using the Fatigue Severity Scale (FSS-7). FSS-7⩾5 was defined as high-level fatigue. The classification models were developed in a machine learning set-up (recursive partitioning, gradient boosting machine, random forest) on a training set (75% patients) and evaluated on the test set (25%).
Results: Altogether, 474 participants (mean (SD) age; 70.5 (11.3), 59% male) were included. The best performing model, random forest, predicted 61.5% of all high-level fatigued subjects correctly, with a specificity of 0.812 and an area under the ROC-curve (ROC-AUC) of 0.728. The most important predictors were fatigue, symptoms of anxiety and depression, physical activity, neuropsychiatric symptoms, dependency, and cognitive function at 3-months follow-up, in addition to age and stroke severity in acute phase. A refitted simpler model, including these variables, predicted high-level fatigue with a sensitivity of 0.654, a specificity of 0.812 and a ROC-AUC of 0.773.
Conclusions: These results indicate a satisfactory ability to predict high-level fatigue in chronic phase post-stroke and may be applicable in clinical settings.
ROC-AUC



Disclosure of interest: No

1302

Prevalence of cerebral microbleeds among Egyptian patients with acute ischemic cerebrovascular stroke

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Background and aims: Cerebral microbleeds (CMBs) are defined as small, round dark-signal lesions detected by special magnetic resonance imaging (MRI) sequences. They are associated with stroke and cognitive decline. The prevalence of CMBs among Egyptian patients with acute ischemic stroke (AIS) is not well studied. Our aim was to detect the prevalence and the associated risk factors of the CMBs among Egyptian patients with AIS.
Methods: A prospective, cross-sectional study included 404 AIS patients. The patients were recruited between January 2021 to January 2022 at the Assuit University hospital in the south of Egypt. Patients with known bleeding diathesis were excluded. All participants underwent full neurological assessment, urgent laboratory investigations and MRI with T2* sequence.
Results: The study included 404 patients, 213 (52.7%) of them were males and 191 (47.3%) were females. The mean age of the study population was 61±1 years and the mean NIHSS was 12±5. The prevalence of CMB in AIS patients was 36%, 57% of them were males and 43% were females. 6.5% of them were young adults. CMBs were more prevalent among patients with large artery atherosclerosis (34.6%), cardioembolic stroke 28%, stroke of undetermined cause (25.2%) and small vessel disease (12.1%). On multivariable logistic regression analysis, age, AF, dyslipidemia, aspirin, dual antiplatelets and combined use of antiplatelets and anticoagulants were independent risk factors associated with the presence of CMBs.
Conclusions: The prevalence of cerebral microbleeds was 36 % in Egyptian patients with AIS. This prevalence is considered high in comparison to other races.
Disclosure of interest: No

1450

Apolipoprotein E genotype association with the risk of hemorrhagic stroke: A systematic review and meta-analysis

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Background and aims: Apolipoprotein E (ApoE) genotypes have been associated with the risk of Hemorrhagic stroke (HS) with conflicting findings. Therefore, we conducted a meta-analysis to determine the association of ApoE alleles with HS risk.
Methods: A literature search was performed till 23rd December 2022 in various databases using the keywords: ('Apolipoprotein E' OR 'ApoE' OR 'ApoE genotype') AND ('Single Nucleotide polymorphisms' OR 'SNP') AND ('Hemorrhagic stroke or 'HS' or 'Intracerebral Cerebral Hemorrhage' or 'ICH'). Pooled Odds Ratio (OR) were determined.
Results: Twenty-two studies with 7,209 HS and 23,625 control subjects were included. Pooled analyses revealed a significant association of ApoE ε3/ε3 with overall HS risk [OR = 1.10, 95% CI =1.02 to 1.19]. However, a significant protective association of ApoE ε2/ε2 [OR = 0.48, 95% CI = 0.32 to 0.72], ApoE ε2/ε4 [OR = 0.50, 95% CI = 0.35 to 0.71], ApoE ε2 [OR = 0.84, 95% CI = 0.76 to 0.94], ApoE ε4/ε4 [OR = 0.60, 95% CI = 0.45 to 0.79], and ApoE ε4 [OR = 0.74, 95% CI = 0.64 to 0.86] was observed with HS occurrence. Population sub-group analyses revealed a significant association of ApoE ε3/ε3 with HS risk in Caucasians [OR = 1.11, 95% CI = 1.01 to 1.22].
Conclusions: Our meta-analysis indicates that HS risk is associated with mainly to ApoE ε3/ε3 genotype, and ApoE ε2/ε2, ε2/ε4, ε2, ε4/ε4, and ε4 had a protective association with HS, suggesting the significant role of ApoE genotypes in the occurrence of HS.
Disclosure of interest: No

1463

Prevalence of Varicella Zoster Virus Reactivation in Cerebrospinal Fluid in Ischemic Stroke or Transient Ischemic Attack

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Background and aims: The risk of ischemic stroke increases after Varicella Zoster Virus (VZV) reactivation. An unknown number of patients may develop stroke associated with VZV reactivation in brain arteries without rash. Here we investigate the prevalence of VZV reactivation in cerebrospinal fluid (CSF) in patients who presented with ischemic stroke or transient ischemic attack (TIA).
Methods: We retrospectively reviewed medical records of patients who presented with ischemic stroke, TIA or stroke like symptoms to University of Texas Southwestern Medical Center from 1/1/2014 to 12/31/2021 and underwent CSF testing. VZV reactivation in CSF was diagnosed by either positive VZV PCR or increased intrathecal anti-VZV IgG synthesis in CSF. Stroke etiology was classified by TOAST criteria. The large vessel atherosclerotic disease was further classified as intracranial or extracranial atherosclerotic disease (ICAD or ECAD). Patients with neurologic conditions other than ischemic stroke or TIA were considered as controls.
Results: Among 204 patients included in the analysis, 178 patients had ischemic stroke (93.8%) or TIA (6.2%), and 26 patients were included in the control group. VZV reactivation in CSF was found to be present in 23.6% and 3.8%, respectively, in ischemic stroke/TIA and control patients. Compared to 2.9% in ECAD, cardiac embolic or other determined etiologies of stroke, VZV reactivation in CSF was present in 28% in patients with ICAD or small vessel disease (SVD).
Conclusions: Among individuals who underwent VZV testing, VZV reactivation in CSF is present in a quarter of patients with ischemic stroke or TIA secondary to ICAD or SVD.
Disclosure of interest: No

1555

PREVALENCE AND CORRELATION OF INTRACRANIAL AND EXTRACRANIAL ATHEROSCLEROSIS IN ACUTE ISCHEMIC STROKE PATIENTS

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Background and aims: Large artery atherosclerosis includes patients with significant (>50%) Intracranial Atherosclerotic Disease (ICAD) and/or Extracranial atherosclerotic Disease (ECAD). Assessment of ICAD is important because it's acute management (mechanical thrombectomy), and secondary preventive management (intensive medical therapy) is significantly different from management of other ischemic stroke subtypes. Aim-To determine the prevalence of significant ICAD and ECAD in acute ischemic stroke patients,their correlation with each other and to assess their risk factors.
Methods: 110 acute ischemic stroke patients were enrolled at a tertiary care hospital in New Delhi,during December 2019 to June 2021. 20 patients were excluded due to incomplete evaluation. Patients were evaluated on the basis of history, physical examination, and investigations after obtaining informed consent.
Results: Large Artery Atherosclerosis (54.4%) was the commonest subtype of acute ischemic stroke in our study. ICAD was observed in 37.8%, ECAD in 8.9%, and 14.4% patients had coexisting ICAD & ECAD. Upon multivariate analysis using binary logistic regression model, patients with Diabetes Mellitus, Hypertension and BMI>25 were found to have higher Odd's to develop ICAD as compared to ECAD.
Conclusions: Our study re-affirms the fact that Large artery atherosclerosis is the most frequent stroke subtype in ischemic stroke patients in India with ICAD being more prevalent than ECAD. This has an important bearing on planning systems for acute stroke management which would necessitate the need for mechanical recanalization. Also, significantly more number of patients with ICAD were hypertensive, diabetic, current smokers, or had BMI>25, which has a bearing on planning preventive measures.
Disclosure of interest: No

1626

Predicting unusual number of ischaemic strokes by weather time series

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Background and aims: Results of published studies that analysed the association between stroke and weather are conflicting and modern predictive modelling in the assessment of this relationship is rarely used. We decided to assess the connection of extreme ischaemic stroke incidence with meteorological factors in the Slovak population together with the creation of predictive models of stroke extreme numbers.
Methods: Daily stroke occurrence and meteorological parameters from 2015 to 2019 were studied. During the data preparation, we defined extremes (days with a large number of ischemic strokes - above the 90th percentile of past occurrences) and created binary time series of stroke occurrence. Cross-correlations were applied to evaluate the association between times series of stroke and meteorological factors. For the formation of consecutive one day-ahead prediction of extreme stroke numbers were used three methods: Logistic regression, Random Forest for time series, and Croston's method.
Results: Totally 52 036 cases of ischemic stroke were documented. Cross-correlations between extremely high stroke numbers and meteorological factors were negligible and insignificant. Logistic regression and Random Forest for time series (methods that use meteorological information for the prediction) had no better results than Croston's method forecasts. The accuracy of the predictions was poor.
Conclusions: Meteorological factors are not helpful in the forecasting of a day with the extreme number of ischaemic strokes.
Disclosure of interest: No

1715

Assessment of the risk of bleeding according to the HAS - BLED scale in the prevention of stroke in patients with atrial fibrillation who have undergone a COVID-19 infection

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Background and aims: The disease COVID-19 can lead to coagulopathy. Bleeding is a major complication of anticoagulant therapy required for the prevention of ischemic stroke in patients (pts) with atrial fibrillation (AF).
Methods: The study included 187 pts aged 62.5±0.9 years (47% men, 53% women). The first three groups formed 116 pts who had AF and underwent coronavirus infection (CI). The first group (G1) consisted of 36 patients who did not have AF before CI. The second group (G2) was represented by 25 patients in whom the transition of the paroxysmal form of AF into persistent, or persistent AF into its permanent form occurred. The third group (G3) consisted of 55 patients in whom the form of AF did not change.
Results: The patients of the 1st, 2nd and 3rd groups compared to the patients of the first control group had a higher risk of bleeding according to the HAS – BLED scale (1,31 vs. 1,24, $p < 0{,}001$). When assessing the risk of bleeding according to the scale of HAS – BLED 0 -2 points and HAS – BLED ⩾ 3 points, it was found that among patients with AF who underwent CI there was a higher percentage of patients with a high risk of bleeding. In the 1st group (38,9% vs. 61,1%, $p < 0{,}01$), in the 2nd group (52% vs. 48%, $p < 0{,}01$).
Conclusions: Patients with AF who have had coronavirus infection have an increased risk of bleeding.
Disclosure of interest: No

1934

ETHNIC DISPARITIES IN THE UTILISATION AND FUNCTIONAL OUTCOMES OF MECHANICAL THROMBECTOMY IN A TERTIARY STROKE CENTRE

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Background and aims: Mechanical thrombectomy (MT) is an effective treatment for acute ischaemic stroke (AIS) secondary to large vessel occlusion (LVO). Previous studies have described ethnic disparities in access to MT. The aim is to study ethnic and geographic disparities in the accessibility and functional outcomes (Modified Rankin Scale (mRS)) of MT in southwest London (urban) and Surrey (suburban) under National Health Service (NHS).
Methods: We conducted a retrospective study exploring baseline characteristics and functional outcome of three ethnic groups (White, Black and Asian) who underwent MT between January 2018 and December 2021.

Results: 307 patients were included: urban White (157), Black (15) and Asian (22), and suburban White (105), Black (0) and Asian (4). Those of mixed or unknown ethnicity were excluded. Data was analysed against local 2021 Census data. There were higher percentages of Black and Asian populations in urban than suburban areas. More White patients received MT than Black and Asian in both urban (p=0.26) and suburban (p=0.13) areas after corrected to the population, although not significantly. Demographics were comparable across ethnicities for age, recanalisation rates and stroke risk factors (except higher diabetes rate in Asian and Black). White patients had higher rates of good functional outcome (mRS 0-2, p=0.012) than Black and Asian, but no significant difference in mortality at 90-day.
Conclusions: Our study showed equality in accessing MT in urban and suburban areas across different ethnicities in our service. Higher stroke risk factors may be associated with poor functional outcome in Asian and Black patient.
Disclosure of interest: No

2396

Impact of diabetes and pre-diabetes on outcomes following first-ever stroke: A Bittersweet Risk?

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Background and aims: Type 2 diabetes (T2D) increases stroke risk by two-fold. Clinical profiles of patients presenting with and without T2D are less well-defined. We compared demographical and stroke-specific outcomes in individuals with first-ever stroke with (T2D)/pre-diabetes (pDM) only vs. without T2D/pDM.
Methods: Individuals presenting with first-ever stroke between January-July 2022 were divided into T2D(n=50)/pDM(n=24) only (n=74) and those without T2D/pDM(n=308). Electronic medical records and Sentinel Stroke National Audit Programme data were retrospectively reviewed.
Results: Median(IQR) age(years) in DM/pDM vs. without DM/pDM was 68.5(57-77) and 72.5(58–83) years, respectively (p=0.19). 64.9% were males in T2D/pDM vs. 53.6% in those without, p=0.08. Among those with DM/pDM, 69% were non-white ethnicity vs. 58.8% in those without (p=0.108). In those without T2D/pDM, 46.4% were hypertensive, 13.3% had atrial fibrillation and 2.6% had cardiac failure on admission. Median admission NIHSS was 5.5 in T2D/pDM vs. 5 in those without, p=0.08. Median pre-stroke modified Rankin score (mRS) was 1 in both groups, whereas discharge mRS was 3.5 in T2D/pDM vs. 3 in those without(p=0.08). Median(IQR) HbA1C(mmol/mol) was 58(50-78) and glucose was 7.7mmol/L in individuals with T2D on admission. Average length of admission was longer in T2D/pDM (16 days) vs. without T2D/pDM (11 days), this did not reach significance (p=0.200). Mortality was significantly greater in individuals with T2D/pDM (16.2%) vs. those without (6.2%) [p=0.004].
Conclusions: We demonstrate significantly higher mortality in first-ever stroke with T2D/pDM, despite adequate admission glycaemic control. Temporal trends may exist with discharge mRS and length of hospital stay which require further exploration.
Disclosure of interest: No

2501

Long-term recurrence of cervical artery dissections

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Background and aims: Cervical artery dissection (CeAD) is an important cause of ischemic strokes in young adults. Risk factors and pathophysiology of CeAD and recurrences are largely unknown. Recurrence is considered most common within the first few weeks. Long-term recurrence does occur and can be asymptomatic. The purpose of this study is to determine the long-term risk of recurrence and the rate of asymptomatic recurrences in a patient cohort.
Methods: 128 CeAD patients were followed between 2014 and 2022, 84 were included. Only patients with follow-up imaging were included. Median observation was 2.9 years, ranging from 0.7 to 7.8 years. Demographical data, symptoms upon admission and imaging reports were collected to determine recurrence rates and risk factors.
Results: 52.4% suffered ischemic stroke following the index CeAD. 4 patients had dissection sequelae at index event. 5 patients had recurrence of CeAD in the observation period, none of which had dissections sequelae at index event. 3 recurrences happened after 6 months. 40% of recurrences after the index event were asymptomatic. 32 patients were readmitted at least once on suspicion of recurrence, where three recurrences were confirmed. By one year, 62.2% had persisting dissection sequelae. A family history of dissections and tortuous arteries on imaging were significantly associated with recurrence.
Conclusions: Recurrence of CeAD in our population were 10,7%, were often asymptomatic and mostly happened after 6 months. Recurrences were associated with a family history of dissections or tortuous arteries. Readmissions due to suspicion of recurrence were common, but rarely confirmed the diagnosis.
Disclosure of interest: No

IMAGING – HYPERACUTE

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CTP-based estimated Ischemic Core: A Comparative Multicenter Study between Olea and RAPID software

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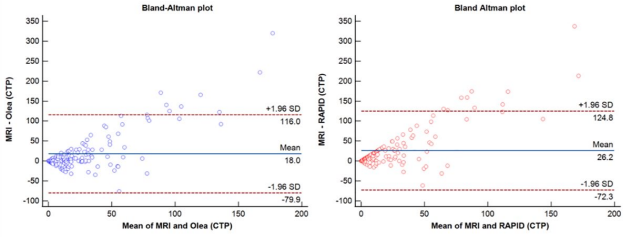
Background and aims: CTP is increasingly used to assess eligibility for endovascular therapy (EVT) in patients with large vessel occlusions (LVO). There remain variability and inconsistencies between software packages for estimation of ischemic core. We aimed to use heterogenous data from four stroke centers to perform a comparative analysis for CTP-estimated ischemic core between RAPID (iSchemaView) and Olea (Olea Medical).
Methods: In this retrospective multicenter study, patients with anterior circulation LVO who underwent pretreatment CTP, successful EVT (defined TICI $\geqslant$2b), and follow-up MRI included. Automated CTP analysis was performed using Olea platform [rCBF$<$25% and differential

time-to-peak (dTTP)>5s] and RAPID (rCBF<30%). The CTP estimated core volumes were compared against the final infarct volume on post treatment MRI-DWI.

Results: A total of 153 patients included. The estimated ischemic core volume (mean ± SD) was 20 ± 19 mL on Olea and 10 ± 18 mL on RAPID, significantly different ($p<0.01$). Both software overestimated the ischemic core volume above 70 mL in 3 subjects (same patients) and each in one additional patient. The difference (mean ± SD) between CTP estimated core and final infarct was 26 ± 99 mL for RAPID and 18 ± 98 mL for Olea (Figure). The correlation between final infarct volume and CTP estimated core was r=0.38, $p<0.01$ for RAPID and r=0.39, $p<0.01$ for Olea.

Conclusions: Substantial variation between Olea and RAPID CTP-estimated core volumes exists, though rates of overcalling of large core were low, 2.4%, for both. Both showed comparable core volume correlation to MRI infarct volume.



Disclosure of interest: Yes

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Radiological features associated with bleeding post endovascular thrombectomy

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Background and aims: Endovascular thrombectomy is associated with high incidence of successful reperfusion and good functional outcomes in acute ischemic stroke, but haemorrhage remains a feared complication. We sought to determine pre-treatment radiological features which may pre-procedurally prognosticate the risk of haemorrhage and guide patient selection.

Methods: A retrospective study of consecutive acute stroke patients who underwent mechanical thrombectomy was performed studying various radiological variables associated with bleeding in the literature. We included age, sex, IV tPA use, blood pressure and onset-to-puncture time in univariate and multivariate analysis.

Results: 261 patients were included in this study. We found higher NIHSS, aortic arch type, lower ASPECTS and increased clot length significantly associated with higher bleeding risk on univariate analysis. On multivariate analysis, aortic arch type, lower ASPECTS and increased clot length were significantly associated with higher bleeding risk.

Conclusions: We found certain radiological features associated with haemorrhage post-procedure. The use of adjunctive IA thrombolytics post recanalization will need careful consideration.

Disclosure of interest: No

	Univariate analysis			Multivariate analysis	
	No SICH	SICH	P-value	Adjusted odds ratio(95% CI)	P-value
Age(mean,year)	65.87	65.66	0.932		
Female	139(90.3%)	15(9.7%)	1.00		
IV TPA given	192(88.9%)	24(11.1%)	0.118		
SBP	160	151	0.095		
Onset-to-puncture time(mean,mins)	287	274	0.727		
Top-to-bottom distance on CT(mean,cm)	0.693	0.694	0.979		
NIHSS(mean)	18.2	20.5	**0.039**	0.894-1.080	0.714
Aortic arch type(median)	2	2	**0.010**	0.168-0.920	**0.031**
Clot burden score(median)	7	6	0.590		
ASPECTS(median)	9	7	**0.000**	0.440-0.774	**0.000**
MCA hyperdense sign	169(87.6%)	24(12.4%)	0.053		
Clot length on non-contrasted CT(mean)	1.37	1.77	**0.014**	1.139-4.310	**0.019**
TICI 2B/3	239(91.6%)	22(8.4%)	0.061		

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Moving from CT-first to MRI-first paradigm in acute ischemic stroke: feasibility, effects on misdiagnosis, stroke etiology, and long-term outcome

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Background and aims: The relative value of CT and MRI in acute ischemic stroke (AIS) is debated. In May 2018, we switched from MRI to CT as first line imaging for suspected AIS. Here, we aimed to retrospectively assess the effects of this paradigm change on diagnosis and disability outcomes.

Methods: We compared all consecutive patients in the Acute STroke Registry and Analysis (ASTRAL) during the MRI-period (05/2018-08/2022) with an identical number of patients during the preceding CT-period, performing univariate and multivariate analyses.

Results: The median age of the 2972 included consecutive AIS patients was 76 (IQR=65-84) years, and 1361 (46%) were female. In the MRI-period, 80% underwent MRI as first acute imaging. The proportion of patients requiring a second acute imaging modality for diagnostic ± revascularization reasons increased from 2.3% to 6.9% ($p_{univ}<0.01$). The rates of initially missed AIS diagnosis was similar (3.8% vs 4.4%, $p_{adj}=0.44$). Thrombolysed stroke mimics decreased by half (8.6% vs 4.3%, $p_{adj}<0.01$). Rates of unidentified stroke mechanism at hospital discharge was higher in the MRI period: 22.8% vs 28.1% ($p_{adj}<0.01$). The length of hospitalisation decreased from 9 (IQR=6-14) to 7 (IQR=4-12) days ($P_{adj}< 0.01$). Disability at 3 months was similar (common adjusted odds ratio for favourable Rankin shift 1.12 (95%CI=0.96-1.30); $p_{adj}=0.138$).

Conclusions: The paradigm shift from CT to MRI as first-line imaging for AIS in a comprehensive stroke centre seems feasible. MRI was associated with reduced thrombolysis of stroke mimics, but not with rates of missed AIS diagnosis, identification of stroke mechanism or long-term outcome.

Disclosure of interest: Yes

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ROLE OF COMPUTERIZED TOMOGRAPHY PERFUSION IN IDENTIFICATION OF CEREBRAL VENOUS THROMBOSIS IN HYPERACUTE PHASE

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Background and aims: Cerebral Venous Thrombosis (CVT) patients often present with stroke-like symptoms. Increasing number of patients undergo computerize tomography perfusion (CTP) acutely, including some CVT patients. We aim to describe the benefit of the addition of CTP to brain non-contrast CT (NCCT) and/or CT angiography (CTA). We estimated the sensitivity, specificity, predictive values and area under the curve (AUC) of the imaging modalities for CVT diagnosis.

Methods: Retrospective patients presenting at our centre from 2001 to 2021 who underwent acute CTP and had a diagnosis of CVT. CVT patients were analyzed at a 1:3 ratio with patients presenting with stroke-like symptoms who underwent CTP. Imaging was reviewed by a neurologist blinded to diagnosis but unblinded to clinical presentation. Receiver operating characteristic curve analysis was performed to estimate sensitivity, specificity, and AUC for the detection of CVT.

Results: A total of 42 patients (7 CVT + 35 controls) were analyzed. The sensitivity of brain NCCT for CVT diagnosis was low (57.1%), with a high specificity (100%), positive and negative predictive values (100 and 92.1% respectively). The discrimination for CVT assessing brain NCCT was moderate, AUC 0.79; 95% CI (0.59-0.98). After CTA review, the sensitivity increased to 85.7%, with a high specificity (100%) and positive and negative predictive values (100 % and 97.2% respectively). The AUC was good, 0.93; 95% CI (0.79-1). Review of CTP maps did not improve the sensitivity, specificity or AUC over brain NCCT+CTA.

Conclusions: CTP analysis in the hyperacute phase did not increase the detection of CVT.

Disclosure of interest: No

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Clinical Characteristics Associated with Acute Ischemic Signs on Non-contrast Computed Tomography

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Background and aims: Non-contrast brain CT (NCCT) remains the routine imaging test for stroke patients to exclude intracranial hemorrhage, but the detection of early ischemia is low. We explored the clinical factors associated with the presence of acute ischemic signs (AI-signs) on NCCT among participants in the alteplase-dose arm of the ENCHANTED trial.

Methods: ENCHANTED assessed the effects of low- versus standard-dose intravenous alteplase in acute ischemic stroke patients. All collected NCCT scans were assessed centrally by an imaging analysis team of trained individuals blind to clinical data using an electronic scoring system modified from the IST-3 trial. Logistic regression models were used to assess associations of clinical factors with AI-signs on baseline NCCT after covariables like time from stroke onset to NCCT scan adjustment.

Results: Among 2458 patients (mean±SD [range] age 67±13 [20-100] years, 38.3% female), there were 571 with AI-signs. Asians (adjusted odds ratio 1.41; 95% confidence interval 1.15, 1.72) and high NIHSS score (1.08; 1.07, 1.10) were independently associated with the presence of any AI-signs, hypoattenuation, or swelling. High NIHSS score (1.15; 1.11, 1.19) and low baseline systolic blood pressure (0.99; 0.97, 1.00) were independently associated with large ischemic lesions. High NIHSS score (1.10; 1.08, 1.12), atrial fibrillation (1.62; 1.26, 2.07), no prior stroke (0.66; 0.48, 0.99) and no diabetes mellitus (0.68; 0.47, 0.98) were independently associated with hyperattenuated arteries.

Conclusions: Specific clinical information related to the presence of AI-signs may help clinicians avoid overlooking early infarct change whilst reviewing the NCCT in their patients.

Disclosure of interest: No

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Variable penumbra but not core volume by occlusion site in large vessel occlusion

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Background and aims: Previous work reported consistent proportions of penumbra but variability in core volume in MCA occlusion. We sought to characterise core and penumbra volumes associated with different supratentorial occlusion sites within 24h of AIS onset.

Methods: We analysed imaging from patients <24h from onset in a prospective observational study.

CTA were reviewed by two experienced assessors and occlusion sites were categorised as internal carotid artery (ICA)- L, ICA- T, proximal MCA M1, distal M1, M2 1 branch, M2>1 branch, M3, posterior cerebral artery (PCA), anterior cerebral artery (ACA), basilar, vertebral, superior cerebellar artery (SCA), or extracranial carotid. Supra-tentorial lesions were defined as ICA, ACA, MCA or PCA.

CTP was processed by RAPID (version 4.7 Ischemaview). Target mismatch was defined as ischaemic core lesion<70ml, a ratio of volume of ischaemic lesion to ischaemic core (Tmax>6s over CBF<30%) of ⩾1.8 and penumbra ⩾15ml.

Median and interquartile range of core and penumbra volumes were compared across occlusion sites by Kruskal-Wallis test.

Results: We selected 89 patients with supra-tentorial LVO and evaluable imaging.

Table 2 details the occlusion sites with associated lesion volumes.

Penumbra, but not core volumes differed significantly by occlusion site (Kruskal-Wallis test, p=0.081 core, p<0.001 penumbra). 69 (76%) cases met target mismatch criteria.

Conclusions: The most frequent occlusion site was a single MCA M2 branch. Penumbra volumes differed among different LVO sites, but not core volumes. Target mismatch was present in the majority of cases.

Table 1: Clinical Characteristics (N=85)

Age (mean, sd) (years)	67 (14)
Gender (n, % male)	52 (58)
Wake-up (n, %)	23 (26)
Pre-stroke good function (mRS≤2) (n, %)	84 (94)
Baseline NIHSS (median, IQR)	9 (5, 15)
Onset to CTP (median, IQR) (hours)	3.6 (2.2, 11.4)
Received thrombolysis (n, %)	54 (61)

n=number, sd=standard devation, mRS=modified Rankin scale, NIHSS=National Institutes of Health Stroke Scale, IQR=interquartile range, CTP=computed tomography perfusion

Table 2: LVO Occlusion sites and associated CTP features

Occlusion site	Number (%), N=89	Core volume, median (IQR) (ml)	Penumbra volume, median (IQR) (ml)	Proportion meeting target mismatch (%)
ICA	14 (16)	14 (0, 30)	142 (106, 199)	79
Proximal M1	13 (15)	11 (0, 34)	121 (68, 166)	85
Distal M1	13 (15)	6 (0, 13)	107 (57, 13)	92
M2 1 branch	25 (28)	0 (0, 11)	35 (11, 53)	72
M2 > 1 branch	8 (9)	2 (0, 16)	84 (57, 117)	100
M3	7 (8)	0 (0, 11)	16 (10, 21)	57
PCA	9 (10)	0 (0, 7)	34 (3, 46)	56

LVO=large vessel occlusion, CTP=CT perfusion, N=number, IQR=interquartile range, ICA=internal carotid artery, Proximal M1=proximal M1 artery, Distal M1=distal M1 artery, M2 1 branch=M2 artery affecting 1 branch, M2>1 branch=M2 artery affecting more than 1 branch, M3=M3 artery, PCA=posterior cerebral artery

Disclosure of interest: No

IMAGING – HYPERACUTE

1128

BRAIN VOLUME DEPENDING ON MIDDLE CEREBRAL ARTERY SEGMENTS: A STUDY USING RAPID AUTOMATED SOFTWARE

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Background and aims: A standardized benchmark value of the brain volume perfused by each middle cerebral artery (MCA) segment, and therefore at risk after an acute occlusion, is lacking. The aim of our study is to identify the brain volume corresponding to each MCA segment using RAPID automated CT perfusion software.
Methods: We performed a retrospective study of consecutive patients with anterior circulation acute ischemic stroke who underwent endovascular treatment in our center from June 2020-February 2022. Patients were included if CT perfusion imaging processed by RAPID software were available. Brain volume vascularized from each occluded artery segment was identified as the volume of tissue with a Tmax value greater than 6 seconds.
Results: N = 129. Male sex 71 (55.04%). Median age 72.7 years [36 to 94]. Mean ischemic brain volume values according to the occlusion site were M3-4 65.33 mL (25.93SD), M2 83.96 mL (76.61SD), distal M1 129.48 mL (50.84), proximal M1 145.86 mL (49.51), terminal internal carotid artery 199.79 mL (97.01 SD). The more proximal occlusion location was associated with a larger territory at risk (p = 0.001). Only in left-sided strokes, the NIHSS score was associated with the site of occlusion (p<0.001).
Conclusions: Our study describes the brain volume perfused by MCA segment, with greater values in more proximal occlusions. Knowing the reference values for each location can be clinically useful and interesting for future research.
Disclosure of interest: No

1247

Thresholds of ischaemia differ depending on recanalisation in patients presenting within 24 hours of acute ischaemic stroke with large vessel occlusion

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Background and aims: Perfusion thresholds for prediction of irreversible tissue damage have been based predominantly on data from thrombolysis populations and differ with more rapid and complete reperfusion. It is unclear whether thresholds vary by time from symptom onset.
Methods: We analysed patients imaged <24h after symptom onset in a prospective observational single-centre study.
Two experienced assessors categorised arterial occlusion sites. CTP was processed by RAPID (version 4.7 Ischemaview). Follow-up infarct volume (FIV) was calculated from manually outlined DWI lesions in MANGO (UTHSCSA version 4.0.1). Follow-up MRA was scored using the arterial occlusive lesion (AOL) score.
We compared the Spearman correlation coefficients for FIV with 1) initial hypoperfused volumes among those who did not recanalize (AOL=0-1), and 2) initial core volumes among those who recanalised (AOL≥2).
Results: We selected 74 patients with LVO and evaluable imaging.
54 patients recanalised, 20 patients did not.
Table 2 compares the Spearman's rank coefficients and figures 1 and 2 are scatter plots demonstrating correlation respectively, divided into time windows. In linear regression, core volume significantly predicted FIV (p=0.003) and time to CTP was non-significant (p=0.711) among patients who did not recanalize; among those who recanalized, FIV was associated with both core (p<0.001) and ischaemic lesion (p=0.018) volumes, and time to CTP was not significant (p=0.062).
Conclusions: Time from onset to imaging did not significantly modify the relationship between perfusion lesions and follow-up infarct volume. This is consistent with thresholds of tissue viability being similar across the time window.

Table 1: Clinical Characteristics (N=74)

Age (mean, sd) (years)	68 (14)
Gender (n, % male)	45 (61)
Wake-up (n, %)	19 (25)
Baseline NIHSS (median, IQR)	9 (8)
Onset to CTP (median, IQR) (hours)	3.6 (8.4)
Received thrombolysis (n, %)	44 (59)

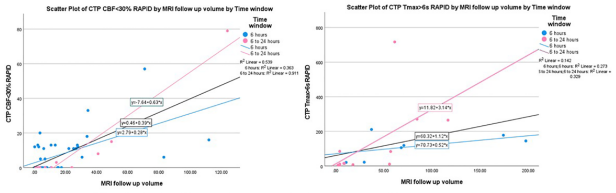
n=number, sd=standard devation, mRS=modified Rankin scale, NIHSS=National Institutes of Health Stroke Scale, IQR=interquartile range, CTP=computed tomography perfusion

Table 2. Spearman's rank coefficients for recanalised and non-recanalised MRI volumes

	<6 hours	6 to 24 hours	Total
Recanalised (CBF<30% compared with FIV)	n=43 Spearman's rho=0.602 p<0.001	n=11 Spearman's rho=0.962 p<0.001	n=54
Did not recanalise (Tmax>6s compared with FIV)	n=7 Spearman's rho=0.522 p=0.229	n=13 Spearman's rho=0.59 p=0.34	n=20
Total number	50	24	74

MRI=magnetic resonance imaging, CBF=cerebral blood flow, CTP=computed tomography perfusion, FIV=follow up infarct volume, Tmax=time to maximum

Figure 2. Scatter plots showing follow-up infarct volume versus CBF volume <30% in recanalised patients and follow-up infarct volume versus T max volume >6s in patients who did not recanalise



CBF=cerebral blood flow, CTP=computed tomography perfusion, Tmax=time to maximum, MRI=magnetic resonance imaging

Disclosure of interest: No

1267

AUTOMATED HYPODENSITY DETECTION TOOL IMPROVES CLINICIAN SCORING

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Background and aims: Reliable detection of early ischaemic changes on non-contrast CT (NCCT) by even experienced clinicians is challenging. Automated NCCT lesion segmentation tools have been validated in ischaemic stroke. The aim is to determine whether the ability of the clinician to detect acute hypodensity on a NCCT is improved with the use of automated hypodensity detection (AHD) on CT, compared with a reference standard (diffusion-weighted MRI/DWI).

Methods: Thirty-two clinicians participated in the study. Using the iTK snap program, clinicians traced the area of hypodensity visible on a single slice NCCT, before and after viewing the AHD output (segmented the hypodensity). Six scans were reviewed by each clinician, varying in size and hemisphere. The hypodensity volumes traced were analyzed in comparison with DWI using the DICE similarity coefficient. DICE scores were analyzed using Wilcoxon-signed rank test, and cluster quantile regression.

Results: Median DICE score for AHD tool was 0.628 (Q1 0.524, Q3 0.649). Clinicians median DICE before AHD was 0.100 (Q1 0, Q3 0.611) increasing to 0.397 after viewing the AHD output (Q1 0, Q3 0.62) $p<0.001$. Trainees performed better (0.38 [CI: 0.27, 0.48]) in comparison to consultants (0.23 [CI: 0.15, 0.30]). The median DICE score increased more for small lesions, 0.331 (CI: 0.249-0.412, p=0.003) compared with large lesions, 0.029 (CI: -0.030-0.089, p=0.338).

Conclusions: The AHD tool substantially improved the DICE score of the clinicians. Notably, junior clinicians were more likely to take on board the AHD output and modify their assessment, and thus outperformed senior clinicians.

Disclosure of interest: No

1341

CAT volume for selection of patients eligible for thrombectomy in late-time window: validation on Italian population

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Background and aims: Desai et al. developed the Clinically Approximated hypoperfused Tissue (CAT) volume, to calculate the hypoperfused tissue volume using NIHSS score. The best specificity and sensibility to identify patients with anterior LVO eligible for late time window EVT, when compared with DEFUSE-2 criteria, was reached by the values of 15 for NIHSS score <10 and 6 for $\geqslant 10$. We tested CAT volume on Italian population using different automated CTP processing software, also trying to find out better fitting conversion factors.

Methods: We performed a retrospective analysis of 105 consecutive AIS patients presenting to 2 comprehensive stroke centers in Italy, that underwent to PCT post-processing using Syngo Volume Perfusion CT Neuro software. All the patients were included to test new conversion factors, meanwhile 28 to validate the original factors in our population.

Results: In Italian population, the original CAT volume factors were able to identify EVT-eligible patients with a sensitivity of 100% and specificity of 57% (PPV 88 %, and NPV 100%). The search of new factors confirmed the best statistic performances of these values, although the different software and population.

Conclusions: CAT volume could be a useful tool for late time window EVT patients selection also in Italian population, using different post-processing software and particularly for spoke centers where advanced neuroimaging techniques are still not available.

Disclosure of interest: No

1558

Automated CT perfusion software in stroke mimics diagnosis

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Background and aims: Stroke mimics (SM) can be diagnosed with perfusion CT(PCT). Its alterations have been studied using conventional software(C-Software), but not with automated ones.Our objective is to evaluate the usefulness of automated RAPID software(RAPID-PCT) for SM diagnosis,whichcould also quantify PCTmaps alterations.

Methods: Retrospective study of patients attended as stroke code at our center from August/2020 to December/2021 with SM diagnosis and PCT processed by both C-Software and RAPID-PCT.Clinical and diagnostic variables, C-Software alteration patterns, RAPID-PCT altered maps and magnitude of these alterations were collected.

Results: 133 SM (12.6%) were identified out of 1058 stroke codes.28 cases did not have PCT processed by both softwares.N=105.Average age 68.25 (SD 16.02).Women 64 (53.8 %).The most frequent diagnosis was epilepsy: 48 (45.7%).Thrombolytic treatment was applied in 3 cases (2.8%) and urgent antiepileptic treatment in 55 (51.9%).Altered PCT was diagnosed with C-software in 50 (47.2%) vs 77 (72.6%) with RAPID-PCT. Alterations were diagnosed with both softwares in 48 (45.5%), only observed in C-software in 2 (1.9%) vs 29 (27.6%) in RAPID-PCT.RAPID-PCT managed to define an alteration pattern in 41 (39%) vs 50 (47.6%) in

C-software.The most frequently altered maps and their quantification with RAPID-PCT were: Tmax>4s(average 81.3ml; SD 139), CBV<42%(average 1.21ml; SD 5.6) and CBF<38%(average 0.91 ml; SD 5.98).
Conclusions: In our study, the use of RAPID-PCT allowed us to diagnose quantitative alterations in PCT maps in most SM,showing a superior diagnostic capacity than the C-software but with worse definition of alteration patterns.The significance of these quantitative alterations will be the target of future studies.
Disclosure of interest: No

1784

Quantifiable estimation of premorbid brain atrophy is associated with poorer functional outcome after endovascular thrombectomy for stroke: a multicentre study

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Background and aims: Endovascular thrombectomy (EVT) provides ischemic stroke patients the greatest chance of excellent functional outcomes. However, there is considerable variability in post-thrombectomy outcomes. Premorbid 'brain health' measures can be quickly extracted by applying image analytics to routinely acquired neuroimaging. In this study, we use acute stroke imaging data to extract a quantitative estimation of brain atrophy and investigate whether this is associated with outcomes following EVT.
Methods: Baseline non-contrast CT images from participants in the International Stroke Perfusion Registry. We defined atrophy as the ratio of cerebrospinal fluid (CSF) volume to brain volume; higher ratios indicated more atrophy. CSF was calculated with 0-15 Hounsfield unit thresholding. Excellent reperfusion immediately after EVT (Thrombolysis in Cerebral Infarction Score 2C/3) was required for inclusion. The primary outcome was 3-month modified Rankin scale (mRS). Functional independence was defined as mRS=0-2. Correlation between atrophy and 0-6 mRS (Spearman test) and comparison between dichotomised groups (Mann-Whitney test) was investigated.
Results: In total, 174 patients were included (female=52%, median age=70 years [IQR=60–80], mean baseline NIHSS=17 [IQR=12–21]) 15 sites and 12 scanner types. Functional independence was achieved by 118 patients. Greater atrophy was significantly associated with higher 3-months mRS (r=0.16; p=0.035). Atrophy differed significantly (p=0.042) between patients with 3-month mRS=0–2 (mean=0.057; SD =0.047) and mRS=3–6 (mean=0.071; SD=0.057).
Conclusions: We demonstrated strong association between quantifiable atrophy and functional outcome across highly variable data. Measuring brain atrophy for predicting outcomes post-EVT warrants further investigation, including predicting adverse events (infarct growth, haemorrhage).
Disclosure of interest: No

1819

Association of blood brain barrier breakdown on the hemorrhagic transformation of acute ischemic stroke

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Background and aims: Hemorrhagic transformation of acute ischemic stroke (AIS) is potentially devastating complication. Ischemic stroke contributes to disruption of blood-brain barrier (BBB). Blood-brain barrier breakdown (BBBB) may exacerbates brain injury caused by ischemic stroke. Early imaging findings of BBBB represent the delayed enhancement of infarct area and leptomeninges. This study is aimed to determine the association of BBBB to hemorrhagic transformation of AIS.
Methods: 180 patients with hemorrhagic transformation of AIS were included, who all underwent MRI study for the evaulation of AIS. As early imaging findings of BBBB, the delayed enhancement was evaluated in the infarct area on black blood image using improved motion-sensitized driven-equilibrium (BBI-iMSDE) sequence, and the leptomeninges on FLAIR image, 10 minutes after gadolinium injection, which was not shown on gadolinium-enhanced T1WI. The imaging findings of BBBB were analyzed with the hemorrhagic transformation of AIS. Sixty controls who had AIS without hemorrhagic transformation during the same period were included.
Results: The delayed enhancement of the infarct area on BBI-iMSDE sequence and/or the leptomeninges on FLAIR image, were significantly associated with the hemorrhagic transformation of AIS, comparing with AIS without hemorrhagic transformation. The delayed enhancement of both the infarct area and the leptomeninges, the infarct area, the leptomeninges as order of higher rates were associated with hemorrhagic transformation of AIS.
Conclusions: BBBB including the delayed enhancement of leptomeninges and infarct area in AIS patients is associated with the hemorrhagic transformation of AIS.
Disclosure of interest: No

1923

PREDICTION OF DEPENDENCY USING AUTOMATED-IMAGING SOFTWARE ANALYSIS OF BRAIN IMAGING IN STROKE: DATA FROM THE RAPID INTERVENTION WITH GLYCERYL TRINITRATE IN HYPERTENSIVE STROKE TRIAL-2 (RIGHT-2)

Lisa Woodhouse[1], Joanna Wardlaw[2], Lesley Cala[3], Nikola Sprigg[1], Philip Bath*[1]
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Background and aims: RIGHT-2 was an ambulance-based trial of glyceryl trinitrate versus sham in patients with presumed stroke and systolic BP >120 mmHg. Routine neuroimaging was performed on admission to hospital to confirm diagnosis. We assessed if variables produced by the automated imaging software predicted 3-month dependency in patients with ultra-acute stroke (ischaemic – AIS or haemorrhage - ICH).
Methods: Scan variables produced by the software included ischaemic core size (eCore), hyperdense artery (eClot), frailty (eFrailty) and haematoma volume (eICH). Dependency at 90 days was assessed using the modified Rankin Scale (mRS). Ordinal logistic regression models were used to determine whether the scan variables predicted dependency and were adjusted for other covariates including age, sex, stroke severity (NIHSS), pre-morbid mRS and time from onset to scan. IS models also included covariates for thrombolysis and thrombectomy.
Results: 1,149 patients were enrolled between October 2015 and May 2018. Of these, 848 (74%) patients had a baseline scan adjudicated by automated imaging software. At baseline: mean age 72 (SD 15); female 49%; severity (NIHSS) 9.8 (7.5); final diagnosis IS 56% and ICH 14%. In AIS patients, day 90 dependency was significantly associated with eCore (p=0.0088) and eFrailty (p=0.035). For ICH patients, eICH alone was associated with day 90 dependency (p=0.0011).
Conclusions: Of the scan variables derived by the automated imaging software, two were associated with dependency in AIS patients and one in ICH patients.
Disclosure of interest: No

1958

CT perfusion to improve detection of intracranial vessel occlusion

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Background and aims: Detection of intracranial vessel occlusions on CT angiography (CTA) images can be challenging. We studied the role of CT perfusion (CTP) summary maps in improving detection accuracy.
Methods: Three individual raters reviewed randomly distributed CTA scans with and without CTP summary maps of 335 consecutive acute ischemic stroke patients (with and without intracranial occlusions) to determine if there were large vessel occlusions (LVO; i.e. carotid, M1- or M2 segment middle cerebral artery [MCA]), MeVO and distal occlusions (i.e. M2 or distal MCA or anterior cerebral artery) or no occlusions. Gold standard was determined by a consensus between two experienced raters exposed to all baseline imaging. We calculated sensitivity, specificity and accuracy with and without CTP and compared the area under the curve (AUC) at a significance level of $p<0.05$.
Results: Of the 335 included patients, 227 had an LVO (68%), 102 had a MeVO or distal occlusion (30%) and there were 75 patients without occlusions (22%). LVO detection accuracy was numerically higher using CTP (AUC range = 0.93-0.97) compared to CTA only (AUC range = 0.89-0.96; p-value for difference = 0.02 for rater 1, non-significant for the other raters). The improvement was greater for the detection of MeVO and distal occlusions (CTA only: AUC range = 0.75–0.88 vs. CTA with CTP: AUC range = 0.85–0.97; $p< 0.01$ for all raters).
Conclusions: Including CTP summary maps improves the accuracy for detection of MeVO and distal occlusions on CTA images in patients with acute ischemic stroke.

	LVO CTA	LVO CTA + CTP	MeVO & distal CTA	MeVO & distal CTA + CTP
Rater 1				
Sensitivity	96 (92-98)	96 (93-98)	78 (69-86)	92 (85-97)
Specificity	82 (74-89)	92 (85-96)	83 (77-87)	84 (79-89)
Rater 2				
Sensitivity	99 (97-100)	100 (98-100)	79 (70-87)	96 (90-99)
Specificity	94 (87-97)	94 (88-98)	97 (94-99)	97 (94-99)
Rater 3				
Sensitivity	86 (81-91)	90 (86-94)	68 (58-77)	83 (75-90)
Specificity	94 (87-97)	94 (88-98)	83 (77-87)	88 (83-92)

Note. __ Data are percentages, with the 95 % confidence intervals between brackets.

***Table 1**: Overview of the sensitivity and specificity of the three raters for LVO and for MeVO and distal occlusions, on CTA only and with access to the CTP data.*

Disclosure of interest: No

2011

INVESTIGATING EARLY BLOOD OXYGEN LEVEL DEPENDENT CEREBROVASCULAR REACTIVITY (BOLD-CVR) ASSOCIATED STEAL PHENOMENON IN PATIENTS WITH ACUTE ISCHEMIC LARGE-VESSEL OCCLUSION (LVO) STROKE

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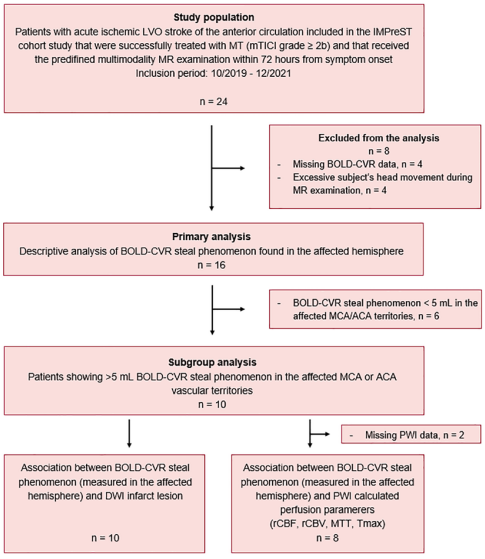
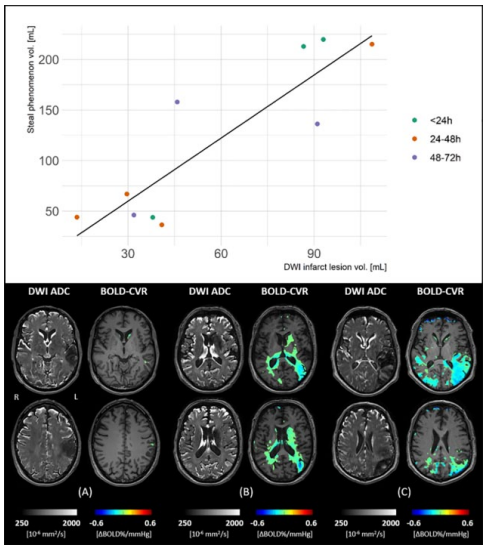
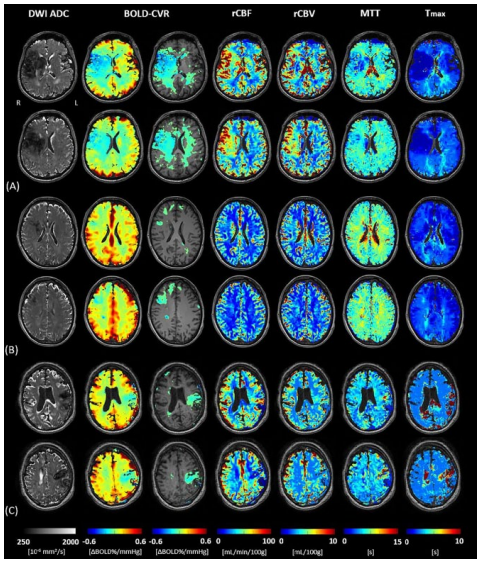
Background and aims: Acute large-vessel occlusion (LVO) stroke represents a subtype of ischemic stroke characterized by the proximal occlusion of a main cerebral vessel with a negative hemodynamic impact on distal brain tissue resulting in hypoperfusion, and (ir)reversible tissue ischemia. Blood oxygen level dependent cerebrovascular reactivity (BOLD-CVR) may aid in elucidating the hemodynamic effects after acute ischemic stroke.
Methods: From a prospective longitudinal observational cohort study, we included all the patients with acute ischemic LVO stroke of the anterior circulation that were successfully treated with mechanical thrombectomy (mTICI scale ⩾ 2b) and received BOLD-CVR examination. In our primary analysis, we described the occurrence of BOLD-CVR associated steal phenomenon in the affected hemisphere. In a subgroup analysis, we studied the relationship between DWI infarct lesion size and steal phenomenon volume and we compared the mean values of perfusion parameters between tissue region exhibiting and not exhibiting steal phenomenon.
Results: Sixteen patients were included in our analysis and ten of them exhibited relevant steal phenomenon volume. A multivariable linear regression model showed a significant independent relationship between DWI infarct lesion size and ipsilateral BOLD-CVR associated steal phenomenon volume (adjusted R2 = 0.71, P value = 0.0054). No distinct perfusion patterns were found in the brain tissue areas exhibiting steal phenomenon.
Conclusions: Patients with unilateral acute ischemic LVO stroke showed relevant BOLD-CVR associated steal phenomenon in the early phase after successful reperfusion. Steal phenomenon volume was associated with DWI infarct lesion size, however, no spatial correlation was found in this study cohort.

Baseline demographics	All (n = 16)
Age	
Mean ± SD	70 ± 15
Year group	
<50	2 (12%)
50-70	5 (31%)
>70	9 (57%)
Sex	
M	9 (57%)
F	7 (43%)
Distribution pattern of large-vessel occlusion disease	
ICA	1 (6%)
MCA (M1/M2 segment)	9 (57%)
Both	6 (37%)
Clinical score at hospital admission	
NIHSS	
Median [min-max]	13 [1-20]
mRS	
Median [min-max]	4 [1-5]
Comorbidities	
Atrial fibrillation	5 (31%)
Smoking history	2 (12%)
Positive family history	2 (12%)
Hypertension	10 (62%)
Dyslipidemia	4 (25%)
Obesity	2 (12%)
Diabetes	1 (6%)
Intravenous thrombolysis	
Yes	12 (75%)
Symptom-to-needle time	
<4.5 hours	11 (69%)
>4.5 hours	2 (12%)
Wake-up stroke	3 (19%)
mTICI grade	
2b	3 (19%)
2c	3 (19%)
3	10 (62%)
Needle-to-MR time	
<24 hours	5 (31%)
24-48 hours	6 (38%)
48-72 hours	5 (31%)
DWI infarct lesion [mL]	
Median [25th-75th percentile]	37 [27-56]







Disclosure of interest: No

2018

Neuroimaging Factors for Prediction of Malignant Brain Edema After Ischemic Stroke: A Systematic Review and Meta-Analysis

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Background and aims: Malignant brain edema (MBE) is a fatal complication after stroke with limited treatment and need timely prediction. We systematically updated neuroimaging predictors for MBE, focusing on imaging modality and assessing time.

Methods: We searched Medline and Embase from inception to December 2022 for studies assessing neuroimaging MBE predictors. Odds ratios (OR) and standardized mean differences (SMD) were pooled in random-effects modeling.

Results: We included 82 studies (7 domains of factors) with risk of bias mainly on comparability and potential publication bias. MBE was associated with larger infarct volume within 72h (n=2555; SMD4.72, 95% CI3.42-6.02), larger parenchymal hypoattenuation within 48h (n=770; OR11.46; 95%CI4.89-26.87), greater midline shift (median 19h, n=1658, SMD3.40, 95%CI1.42 to 5.38) and revascularization (median 8h, n=5702; OR0.42; 95%CI0.29–0.62). For novel neuroimaging factors, increased brain net water uptake(NWU) on multimodal CT within 24h (n=435, OR2.59, 95%CI1.64-3.54), reduced cerebrospinal fluid(CSF) volume within 6h on CT/MRI(n=168, SMD-1.37,95%CI-2.43 to -0.32), reduced CSF/intracranial volume(CSF/ICV) on CT within 12h(n=1642, SMD-0.98, 95%CI-1.36 to -0.59), greater percentage of CSF reduction (ΔCSF%) from baseline within 24h on CT/MRI(n=997, SMD4.07, 95%CI1.51-6.64), higher optic nerve sheath diameter(ONSD) (n=204, SMD1.24, 95%CI0.76-1.73) and ONSD/eyeball transverse diameter(ONSD/ETD) within 36h on CT/MRI(n=175,SMD 1.32, 95%CI0.63-2.01), and 24h-post-intervention contrast enhancement(CA) on CT (n=559, OR 8.18, 95%CI 3.69-18.12) were associated with increased risk of MBE.

Conclusions: MBE was associated with larger infarct volume, larger parenchymal hypoattenuation, greater midline shift and revascularization. Increased NWU, reduced CSF volume or CSF/ICV, greater ΔCSF%, higher ONSD or ONSD/ETD, and post-intervention CA were novel neuroimaging predictors.

Disclosure of interest: No

2065

POST-REPERFUSION INFARCT GROWTH AS A MARKER OF SECONDARY TISSUE INJURY – A LONGITUDINAL MRI STUDY IMMEDIATELY AFTER THROMBECTOMY

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Background and aims: The phenomenon of post-reperfusion infarct growth is not well understood. We aimed to characterise the radiological characteristics and significance of infarct growth within the first 72hours after successful thrombectomy.

Methods: In this prospective multicenter study (Post-Reperfusion pathophysiology in Acute Ischemic StrokE [PRAISE]), patients with successful (eTICI2b-3) angiographic reperfusion for anterior circulation LVOs at two comprehensive stroke centres underwent two 3T MRIs immediately (Timepoint 1 [TP1]) and 24-72hours (Timepoint 2 [TP2]) post-thrombectomy. After images co-registration, infarct growth was defined as new regions of restricted diffusion on DWI after TP1. Mean diffusion kurtosis (MK), a quantitative imaging marker of tissue microstructural disruption, of the infarct growth Region-Of-Interest was compared between TP1 and TP2.

Results: Among 67 patients (median age 72years-old [IQR 58-79], NIHSS 17 [IQR 11-20]), the median volume of infarct growth was 17.9ml (IQR 6.1-40.0), accounting for 52.1% of the final infarct volume at TP2 (29.1ml [IQR 10.3-77.9]). Patients with lower eTICI grade had more Infarct growth (2bvs2c/3, 27.5 vs 11.3ml;p=0.024). Infarct growth was associated poor functional outcome (90-days mRS⩾3) after adjusting for final infarct volume at TP2, age, pre-morbid mRS and NIHSS (aOR 1.12[95%CI 1.04-1.21,p=0.002]). MK of the infarct growth ROI was significantly higher at TP2 compared to TP1 (1.03 vs 0.86,p<0.001), indicating progressive tissue injury despite reperfusion.

Conclusions: Post-reperfusion infarct growth correlates with progressive tissue injury, accounts for half of the total infarct volume and is associated with poor outcome. Further studies on the etiology and potential treatments for secondary ischemic injury is warranted.

Disclosure of interest: No

2376

MINIATURISED CARBON NANOTUBE CT SCANNING FOR PRE-HOSPITAL STROKE MANAGEMENT

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Background and aims: Mobile Stroke Units (MSUs) improve acute stroke outcomes by bringing stroke teams equipped with neuroimaging, to patients, reducing time-to-treatment. Computed Tomography (CT) scanners used in most MSUs weigh ~500kg, necessitating dedicated custom vehicles, limiting feasibility in low-population-density areas where access to thrombolysis is often poor.

We are developing a miniaturized CT brain scanner to enable pre-hospital stroke assessment in standard ambulances and aircraft. The scanner, comprising 31 carbon-nanotube x-ray sources and a curved x-ray detector (figure 1), designed to detect intracerebral haemorrhage (ICH), will weigh under 100kg.

Methods: Scanner geometry, including source arc radius, sampling density, and rotational indexing, was optimised using Monte-Carlo simulations and validated on an x-ray test bench. Images were reconstructed using a Penalised-Weighted-Least-Squares (PWLS) algorithm with Huber penalty and modified weighting for compensation of lateral truncation. Non-uniformity of the brain parenchyma attenuation and contrast-to-variance ratio of simulated bleed inserts were measured in the reconstructed volume.

Results: Contrast-to-variance ratio and uniformity were maximized with a source-arc radius of 450 mm and a 45° rotational indexing (figure 2). Simulated ICH with nominal density of 115 HU and 33.5 mm^3 volume were detected in physical phantom scans (figure 3).

Conclusions: We demonstrate feasibility of a compact, lightweight multisource CT for mobile stroke assessment in rural areas. Further work in algorithm development, including scatter correction and validation, including human trials is planned. Once completed, the scanner could transform mobile stroke imaging in low-population-density areas, improving equity in stroke treatment.

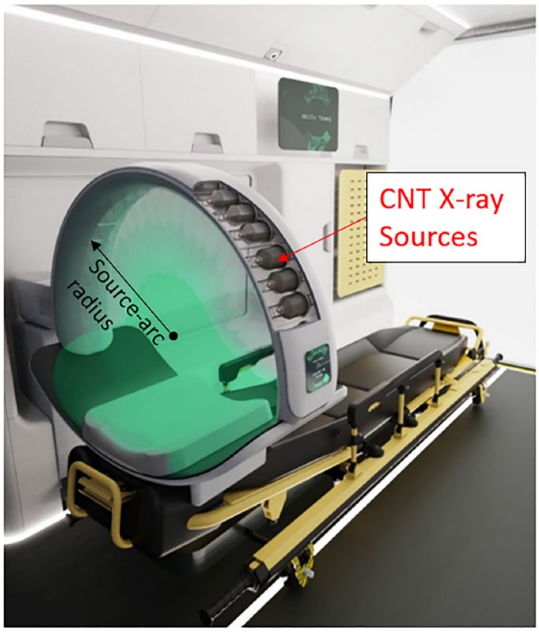

Figure 1.

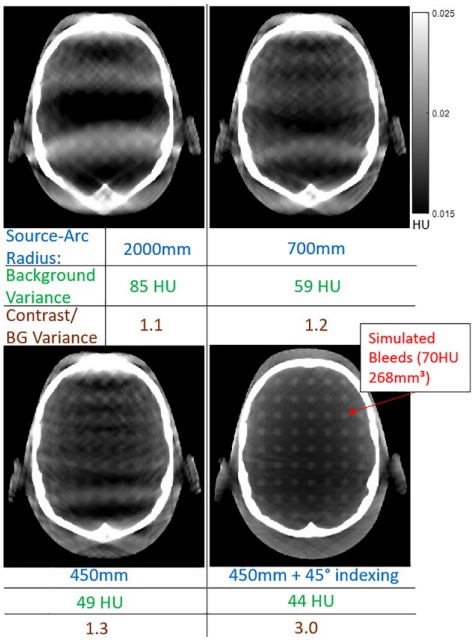

Figure 2.

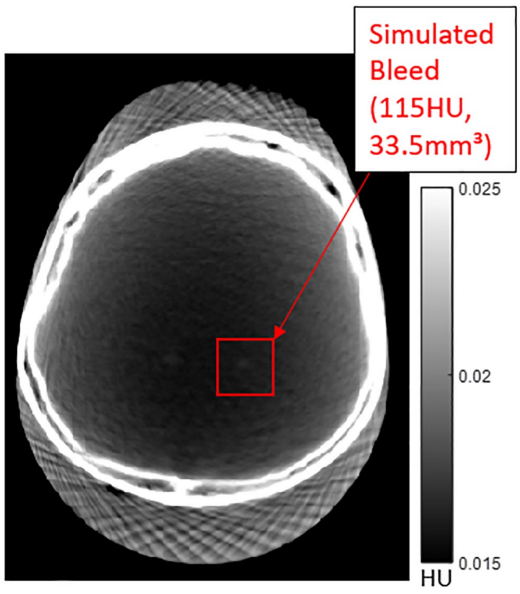

Figure 3.

Disclosure of interest: Yes

2517

The Optimal Timing of the CT-Angiogram Acquisition for Perfusion Imaging

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Background and aims: Multi-phase CT angiograms (mCTA) can provide similar perfusion information to CT perfusion (CTP) for diagnosing and determining acute ischemic stroke (AIS) severity and perfusion characteristics such as penumbra and core. This study evaluates the optimal mCTA phase timing for perfusion imaging by using the CTP to simulate three different time epochs of the mCTA.
Methods: Selected phases from the CTP are post-processed and Gaussian-filtered to produce perfusion base maps using the Simple Perfusion Reconstruction Algorithm (SPIRAL) method. The maps are inputs in a logistic regression model trained against gold standard segmentations from GE-CTP T-MAX maps, thresholded at T-MAX = 9.9 s and T-MAX = 15.4 for penumbra and core, respectively.[2] Using the SPIRAL method[3], three types of logistic regression models were generated: 1) Simulating the current mCTA protocol timing from sampling 3 CTP phases, 2) systematically shifting the overall phase timing into the venous phase, and 3) including all 24-phases of the CTP to determine the upper limit of performance.
Results: The methodology was applied to 75 AIS patients with CTP acquired acutely. The current mCTA ($AUC^{penumbra}$ = 0.848, AUC^{core} = 0.706) performed similarly to optimal penumbra "Config A" ($AUC^{penumbra}$ = 0.889, AUC^{core} = 0.685) and optimal core "Config B" ($AUC^{penumbra}$ = 0.854, AUC^{core} = 0.745), and were not significantly lower than the SPIRAL 24-phase results ($AUC^{penumbra}$ = 0.872, AUC^{core} = 0.759) (see Figure 1).
Conclusions: This work shows the current multi-phase CT angiogram acquisition already provides near-optimal timing for perfusion imaging, especially for identification of penumbra.

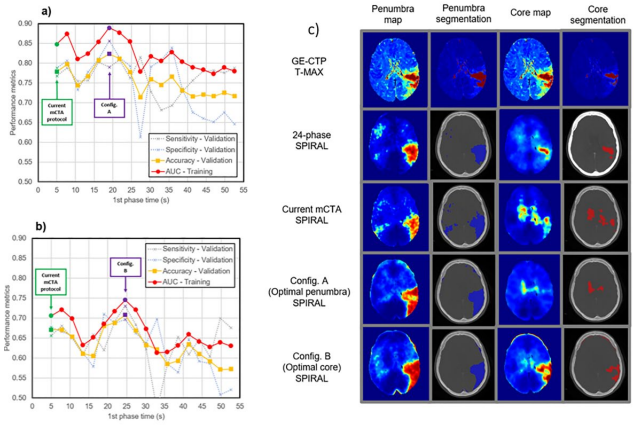

Figure 1. Global performance metrics for a) penumbra discrimination and b) core discrimination for each 3-phase protocol simulated by sampling specific phases of the CTP acquisition; c) example patient SPIRAL and T-MAX maps are shown using four different SPIRAL models.

Disclosure of interest: No

2537

THE BURDEN OF CEREBROVASCULAR LESIONS IN TRANSIENT ISCHEMIC ATTACK

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Background and aims: Transient ischemic attacks (TIA) define acute neurological deficits of vascular origin with complete remission of symptoms within 24 hours. In some definitions, this includes absence of acute infarction on imaging. Nevertheless, up to 1/3 of patients experience long-lasting impairments. It is hypothesized that these impairments might be related to the baseline burden of cerebrovascular lesions. Aim of this study was to characterize the extend of cerebrovascular lesions as this might be an indicator for non-favourable outcome with long lasting impairments.
Methods: Single-centre retrospective cohort study, Aalborg University Hospital: Three independent investigators reviewed the magnet resonance imaging (MRI with diffusion weighted-, FLAIR-, T2- and T2*-sequence) in patients with TIA from 2014-2020. The presence of acute infarction, periventricular and deep white matter lesions, microbleeds, superficial siderosis, and encephalomalacia was assessed.
Results: Out of 2424 MRI assessments, acute infarction was seen in 327 (13,5%) patients. The prevalence and grade of periventricular and deep white matter lesions, the amount of microbleeds, and the presence of encephalomalacia was increasing with age. These changes were more frequent in patients with acute infarction. Superficial siderosis was found in 33 (1.4%) patients.
Conclusions: This retrospective analysis showed that the prevalence and grade of cerebrovascular lesions increased with age. These changes are present in the younger TIA age groups compared to a normal population described in the literature. Also, changes are more frequent in patients with acute infarction. Further investigations are needed to assess whether these findings can be a predictor for non-favourable outcome after TIA.
Disclosure of interest: No

2564

LEPTOMENINGEAL COLLATERAL STATUS BY SIGNAL VARIANCE IN PERFUSION MRI - IMPACT ON ELIGIBILITY FOR ENDOVASCULAR THROMBECTOMY AND EARLY FUNCTIONAL OUTCOME

Niklas Helwig[1], Fatih Seker[2], Markus Möhlenbruch[2], Ralf Deichmann[3], Ulrike Nöth[3], René-Maxime Gracien[1], Elke Hattingen[4], Marlies Wagner[4], Alexander Seiler*[1]

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Background and aims: Collaterals are the main determinants of the severity of cerebral ischemia and control the pace of the ischemic tissue damage in acute ischemic stroke. Assessment of collateral status remains a major challenge in stroke imaging. We evaluated a signal variance-based collateral vessel index in perfusion-weighted imaging (CVI_{PWI}) in terms of its association with stroke severity and its impact on early functional outcome after endovascular thrombectomy (EVT) in patients with large-vessel occlusion (LVO).

Methods: T2*-weighted time series from dynamic susceptibility contrast (DSC) perfusion imaging were processed to calculate the CVI_{PWI}. Ischemic cores were segmented automatically on apparent diffusion coefficient (ADC) maps. Relationship between collateral status and stroke severity as well as the association between the CVI_{PWI} and functional outcome in patients undergoing EVT were analyzed.

Results: 156 patients with LVO were included in the final analysis. Higher CVI_{PWI} and thus better collateral supply was associated with lower baseline NIHSS and smaller baseline infarct volumes (p=0.022 and p=0.002). In EVT patients, (n=105), CVI_{PWI} was an independent predictor of favorable outcome (modified Rankin Scale score 0-2) at discharge in multivariate analysis (p=0.031). In EVT patients with successful reperfusion (n=79), good collateral status was associated with a higher rate of early neurological improvement (p=0.026) and better functional outcome at discharge (p=0.04) in shift analysis.

Conclusions: Signal variance-based CVI_{PWI} represents a semi-quantitative and objective, thus observer-independent parameter for direct assessment of collateral status with clinical relevance. Its use may inform clinical decision-making and may be of interest for clinical stroke trials.

Disclosure of interest: No

2569

Clinical and multimodality CT imaging characteristics among known and unknown stroke onset patients. Data from the OMIC IS BRAIN project

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Background and aims: We investigated clinical and multimodalityCT (MCT) on admission imaging and outcomes in patients with known onset stroke (KOS), wake-up stroke (WUS) and unknown onset stroke (UKS).

Methods: Patients were recruited prospectively between May 2021 and December 2022. All patients were evaluated within <24h of last seen well. Clinical characteristics, vascular risk factors (VRF), etiology and MCT evaluated by RAPID software were compared between groups. We excluded patients with transient ischemic attack, lacunar and posterior territory infarctions.

Results: We included 324 patients: 199 (61.4%) KOS, 68 (21.0%) WAS and 57 (17.6%) UKS. Mean age was 75.3 (12.6) years. 148 (45.8%) were female. Large vessel occlusion (LVO) was observed in 159 (49.1%) patients. 55 (17%) patients had mismatch pattern without LVO. Median CBF<30% and Tmax>6s were 0 (0-10) and 34.0 (0-101.5) mL respectively. Median ASPECTS score was 10.0 (9.0-10.0). Cardioembolism (149 patients [46.6]) was the most frequent etiology. There were no significant differences in the distribution of VRF, MCT, etiological subtypes and NIHSS. However, WUS patients were significantly older, had higher proportion of previous cognitive impairment and higher premorbid mRS than other groups. UKS and WUS had significantly higher proportion of patients with ASPECTS<5 (10.6% and 10.9% versus 1.5% p-value 0.001). WAS had higher proportion of patients with CBF<30%>70cc than UKS (12.9% vs. 0% p=0.033).

Conclusions: There are only minor clinical differences between KOS and unknown onset groups. In addition, there were not significant differences in main MCT parameters.

Disclosure of interest: No

2593

DETECTION OF HYPOPERFUSION IN ACUTE STROKE ON NON-CONTRAST CT USING TEXTURE-BASED STATISTICAL MODELS

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Background and aims: Computed Tomography (CT) perfusion is important for selecting patients for Endovascular Therapy (EVT) but is not widely available. Non-Contrast CT (NCCT) provides faster imaging technique, lower cost, and broad accessibility. In the study, we aim to identify CTP-defined hypoperfusion on NCCT using texture analysis approach.

Methods: Acute stroke patients with large/medium vessel occlusions underwent NCCT and CTP imaging. Twenty-four texture-based spatial filters (Laplacian of Gaussian, Sobel, Rank, Gradient Magnitude, and fundamental statistical measurements) from the python library SciPy were applied to the NCCT. Linear discriminant analysis was used to rank the texture maps. The highest ranked 5 texture maps were used as inputs into a logistic regression model trained using Time-to-max (T-Max) < 6s as the gold standard for the stroke lesion.

Results: The Receiver Operating Characteristics (ROC) analysis of the training set of 78 patients (median age = 67, median NIHSS = 11, 27 patients with large vessel occlusion and 29 patients with medium vessel occlusion) produced an Area Under the Curve (AUC) of 0.72. Maps generated from the model are shown in Figure 1.

Conclusions: Initial results indicate that regions of hypoperfusion following acute ischaemic stroke can be detected using texture analysis filters applied to NCCT. Further optimization will focus on adding advanced textural feature types and including additional performance metrics.

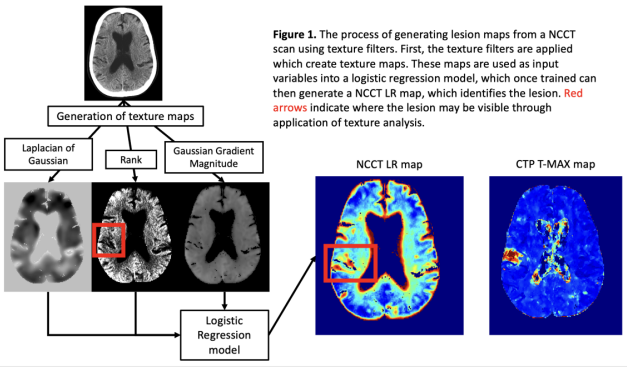

Figure 1. The process of generating lesion maps from a NCCT scan using texture filters. First, the texture filters are applied which create texture maps. These maps are used as input variables into a logistic regression model, which once trained can then generate a NCCT LR map, which identifies the lesion. Red arrows indicate where the lesion may be visible through application of texture analysis.

Disclosure of interest: No

2608

Delivery of a National Optimal Stroke Imaging Pathway (NOSIP), including the use of Artificial Intelligence (AI) as a CT decision support tool, in England

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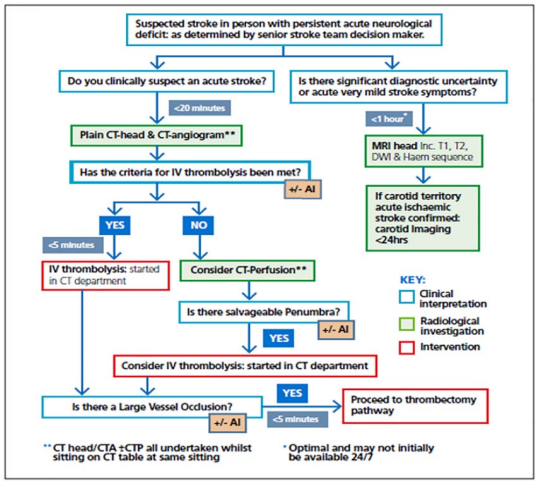
Background and aims: Mechanical thrombectomy (MT) rates in England were consistently below 2% (Dec 2021) with limited access to CTA, door in door out times of 2hrs 22 mins and inefficiency in access to first line MRI (2%). In 2019, 5% of units were using AI, 12% of patients received both CT and MRI within first 24 hrs of admission.
In 2021 the NOSIP was published including use of CT AI, aiming to improve volume and speed of access to recanalisation therapy, reducing inefficiencies and inpatient bed occupancy.
We undertook an assessment of adherence to the NOSIP in 2022.
Methods: Each of the 107 acutely admitting stroke centres in England completed a self-assessment of adherence to the various elements of the NOSIP.
Results:

- 80% of stroke units now report use of AI, the remaining expect to <6/12.
- 60% undertake CT and CTA at same initial sitting.
- 50% routinely use AI for all patients having a CT or CTA
- 15% report day time Mon-Friday access to first line MRI for minor stroke or diagnostic uncertainty.

Conclusions: Since the publication of the NOSIP: most stroke units in England now have access to AI with all units planned to have access by Dec 2023. Significant improvement in access to CT, CTA and CTP and first line MRI is reported.
A nationally adopted care pathway for imaging is associated with improvements in access to imaging and is likely to translate to improved patient outcomes and financial savings.



https://www.england.nhs.uk/wp-content/uploads/2021/05/national-stroke-service-model-integrated-stroke-delivery-networks-may-2021.pdf

IMPORTANT: Patients should not be transferred from an Acute Stroke Centre (ASC) to Comprehensive Stroke Centre (CSC) for initial diagnostic imaging. It is acknowledged that not all elements of the NOSIP will be deliverable immediately at all centres.

Why is imaging important for patients with stroke like symptoms?
Imaging is a fundamental component of the initial assessment of patients suspected of suffering a stroke. It is crucial that individuals suspected of having a stroke are given the most appropriate brain scan to identify the group amenable to time critical therapy. Imaging is also vital in distinguishing between those patients who have symptoms suggestive of stroke but actually have a non-stroke diagnosis.

Why speed is crucial?
Individuals with suspected acute stroke should be given brain imaging as soon as possible. The benefit from reperfusion therapy decreases with each minute diagnosis and treatment is delayed.

What is the NOSIP?
A pathway designed to guide the efficient use of radiology resources and reduce duplication; providing rapid diagnosis of acute stroke and stroke mimics and ensuring access to the time dependant treatments of IV Thrombolysis and Thrombectomy (T)

How has the NOSIP been developed?
The NOSIP has been developed following detailed review of imaging pathways in all122 acute stroke care providers in England and analysis from Diagnostic Imaging Data (DID). This information was combined with best evidence and extensive expert consensus including the NHS National Imaging Optimisation Delivery Board and Intercollegiate Stroke Working Party.

Why is the NOSIP important for patients?
It is expected that adherence to this pathway will both increase the number of patients eligible for recannulation therapy and reduce the time to intervention. This will reduce the numbers of patients living with life changing disability following a stroke. It is expected that there will also be an overall reduction in length of stay for patients presenting with stroke like symptoms due to earlier diagnosis.

Will there be an increase in the volume of MRI scanning?
DID's suggests that 12% (8,850 / yr) of patients admitted with a confirmed stroke have both a CT and MRI within 24hrs, on admission. Whilst some of this dual investigation may be justified, it is envisaged that the vast majority of initial CT scans may be avoided if MRI was available first line. There are at least the same number of additional patients who also have duplication of CT and then MRI but who end up with a non-stroke diagnosis confirmed; these patients in particular will benefit from a first to MRI policy. Total volume of MRI scanning is not expected to increase significantly but there will be an expected release of up to 16000 plain CT scans / year.

What Is the Role of Artificial intelligence (AI) in stroke imaging
AI should be used as a decision support tool only. It should not be used to substitute expert interpretation. Its use should support systems in the rapid assessment and selection of patients for recanalisation intervention in line with its licence or as part of a clinical trial only.

Abbreviations and glossary

MRI - Magnetic Resonance Imaging
T1/T2 - MRI imaging sequences
CT - Computerised Tomography
DWI - Diffusion-Weighted Imaging sequence
Haem - haemorrhage identification series
IV - Intravenous

Disclosure of interest: No

IMAGING – NON ACUTE INCLUDING NEUROSONOLOGY

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Serial Hemodynamics of Cervical Carotid Artery Dissections using Quantitative Magnetic Resonance Angiography

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Background and aims: Cervical carotid dissections often resolve with time. We used quantitative magnetic resonance angiography (QMRA) to quantify the hemodynamic changes associated with cervical carotid dissections.
Methods: We retrospectively reviewed patients that underwent initial and follow-up QMRA for acute cervical carotid dissection between 2009 and 2021. QMRA single-vessel flow was assessed in the ipsilateral internal, middle, anterior, and posterior cerebral arteries, and the basilar artery. Patients without QMRA within two months or who underwent angioplasty and stenting were excluded.
Results: Of the 32 screened patients, seven met study inclusion. The mean +/- SD age of the cohort was 64.8 +/- 28.0 years, all men. The median (IQR) time between dissection discovery and initial QMRA was 23.5 (1 – 41) days and between initial QMRA and serial QMRA was 163 (81 - 200) days. Ipsilateral ICA and ACA A1 flow improved in all seven patients with a median improvement of 71 and 17 (mL/min), respectively, and two of three patients that initially had retrograde cross collateral flow reverted to anterograde flow. Ipsilateral PCA and basilar flow decreased in all but one patient reflecting reduced compensatory stress on the posterior circulation. All patients remained stroke-free.
Conclusions: Increased ipsilateral ICA flow, reversal of retrograde A1 cross collateral flow, and a decrease in vertebrobasilar flow are reflective of hemodynamic recovery and occurred in nearly all patients in this small cohort. Hemodynamic improvement supports the high rates of spontaneous resolution of cervical carotid dissections and supports the use of QMRA in hemodynamic assessment.
Disclosure of interest: No

814

Visualising and quantitatively measuring brain fluid pathways, including meningeal lymphatics, in humans using widely available MRI techniques

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Background and aims: Brain fluid management remains poorly understood with central issues unresolved. In this pilot study, we first review the literature regarding points of controversy, then investigate methods to use conventional MRI techniques to assess brain fluid outflow pathways and explore potential associations with small vessel disease (SVD).
Methods: We used MRI data from 19 subjects participating in the Mild Stroke Study 3, specifically FLAIR imaging before and 20-30 minutes after the intravenous administration of Gadolinium (Gd)-based contrast. The signal intensity (SI) was assessed quantitatively by placing regions of interest, and qualitatively by a visual scoring system, along dorsal and basal fluid outflow routes.
Results: The SI increased substantially along the anterior, middle, and posterior SSS (82%, 104%, and 119%, respectively), at basal areas (cribriform plate, 67%; jugular foramina, 72%), and in narrow spaces surrounding the superficial cortical superficial veins (96%) separate from the surrounding cerebrospinal fluid spaces (all $p<0.001$). The SI increase was associated with more intraparenchymal perivascular spaces (std. Beta 0.71, p=0.014).
Conclusions: Our findings suggests that interstitial fluid drains from brain parenchyma to meningeal lymphatic vessels along the SSS, possibly via superficial cortical perivenous spaces, kept separate from the CSF spaces. Also, these seem to be associated with parenchymal PVS.
Disclosure of interest: No

1664

DUPLEX ULTRASOUND DIAGNOSIS OF CAROTID NEAR OCCLUSION

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Background and aims: Carotid near-occlusion (CNO) diagnosis relies on MR/CT or digital subtraction angiography (DSA – gold standard). Duplex ultrasound (DU) based diagnosis remains challenging due to lack of diagnostic criteria. We assess the utility of DU for distinguishing high-grade stenosis (HGS), CNO without (CNOwoFC), and with full collapse (CNOwFC).
Methods: Patients diagnosed with >80% NASCET stenosis between 01.2012-02.2021 who received a MR/CT/DSA within 3 months were included. An experienced neuroradiologist blinded to outcome and DU

data confirmed the diagnosis (HGS vs. CNOwoFC vs. CNOwFC) on MR/CT or DSA. DU values and suspected diagnosis (HGS vs. CNO) were extracted from clinical charts. Different US parameters were correlated to the imaging-based diagnosis.
Results: Out of 91 screened patients, we included 21 HGS, 34 CNOwoFC and 23 CNOwFC. DU based diagnosis of CNO vs. HGS was only concordant with neuroradiology in 54%. CNOwoFC was commonly misdiagnosed as HGS (85.3%) based on DU alone. Analogous, DU velocities did not aid CNOwoFC/HGS distinction. Thus, we evaluated possibility of differentiation between HGS/CNOwoFC and CNOwFC by ROC. Stenotic as well as post-stenotic peak-systolic velocities (PSV), end-diastolic velocities (EDV), and different indices distinguished either group with (AUC 0.64-0.74). Optimal cutoffs for differentiation included 190.5 cm/s (stenotic PSV), 14.5 cm/s (stenotic EDV), 33.5 cm/s (post-stenotic PSV).
Conclusions: CNOwFC is associated with a worse prognosis compared to HGS/CNOwoFC. DU provides essential information for this distinction and thus can be used for non-invasive/widely available screening. Future research should aim at including further qualitative criteria to improve diagnostic accuracy of DU.
Disclosure of interest: No

1689

POINT OF CARE ULTRASOUND IN A SPECIALIZED OUTPATIENT CLINIC FOR TRANSIENT ISCHEMIC ATTACK

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Background and aims: To address the need of a multimodal approach to transient ischemic attack (TIA) in specialized outpatient clinics, a specific Point of care ultrasound (POCUS), able to provide real-time information to aid clinical decision making, was implemented in a TIA-clinic of a comprehensive stroke center. The objective is to present the ultrasonography protocol and the main findings during the first six months after its implementation.
Methods: Patients evaluated in a TIA-clinic during 6 months after the POCUS implementation (October 2021-March 2022). The TIA-POCUS includes evaluation of supra-aortic trunks, intracranial arteries, focused cardiac ultrasound (FoCUS) and, in some cases, evaluation of temporal arteries. FoCUS has been implemented as a screening tool for the identification of left ventricular dysfunction, significant valvulopathies, intracardiac masses and left atrial enlargement (LAE), a risk factor for atrial fibrillation.
Results: Overall, 91 patients were evaluated, median (IQR) age 67 (55-77) and ABCD2 score 3 (2-5), with a 59.3% of male patients. TIA-POCUS identified two carotid occlusion and 9 cases of carotid stenosis >50%. In 5 cases, vertebral stenosis/occlusion was found and in 8, intracranial significant stenosis was diagnosed. FoCUS showed 2 patients with suspected significant left ventricular dysfunction and 2 possible severe aortic stenosis. 20 patients met criteria of LAE and benefited from prolonged cardiac monitoring.
Conclusions: Specific and standardized TIA-POCUS, including evaluation of supra-aortic, intracranial arteries and FoCUS, can provide pathophysiological and hemodynamic information helping clinical decisions in specialized outpatient TIA-clinics. It should be applied for the specific indications and performed by trained clinicians.
Disclosure of interest: No

1790

Association between CTA features and prognosis of patients with dizziness

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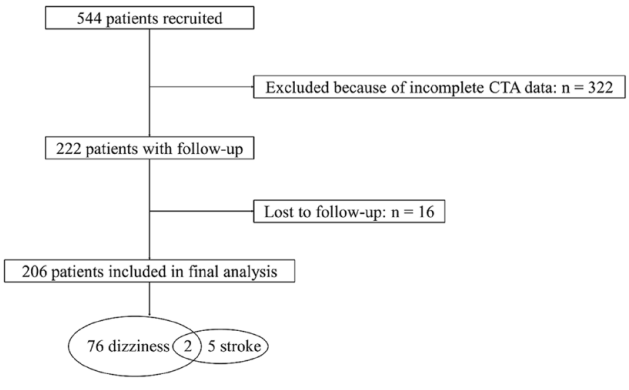
Background and aims: To assess the association between head and neck computed tomography angiography (CTA) features and prognosis of patients with dizziness.
Methods: We prospectively included patients chiefly complaining dizziness and underwent head and neck CTA in the emergency department of West China Hospital, Sichuan University, from January 1st 2022 to May 31st 2022. Head and neck CTA features included atherosclerosis, stenoses, plaque, intramural calcification, arterial aneurysm, thin arteries, and CT features included parenchymal hypodensity, hyperdensity, brain atrophy, and white matter demyelination. Chronic dizziness was defined as persistent dizziness constantly or periodically over 3 months by this onset. The primary outcome was recurrent dizziness within 3 months after this onset. Secondary outcome was acute stroke (ischemic or haemorrhagic) within 3 months after this onset.
Results: Of 206 patients included (mean age: 59 years; 60.2% females), 76 (36.9%) had recurrent dizziness and 7 (3.4%) reported acute stroke (6 ischaemic, 1 haemorrhagic) within 3 months. In multivariate logistic regression analysis, chronic dizziness (OR 4.04, 95% CI 1.68-9.68, P = 0.002) and hypodensity (OR 2.18, 95% CI 1.03-4.63, P = 0.042) were associated with an increased risk of recurrent dizziness; hypodensity was significantly associated with an increased risk of acute stroke (OR 35.17, 95% CI 4.08-302.95, P = 0.001). No significant association was found between atherosclerosis, stenoses, plaque, intramural calcification, arterial aneurysm, or thin arteries and outcomes.
Conclusions: Hypodensity was associated with an increased risk of recurrent dizziness and acute stroke. Patients with chronic dizziness were more likely to get recurrent dizziness.

Funding
This study was supported by National Natural Science Foundation of China (82171285).

Figure 1. Study Profile



Disclosure of interest: No

2266

Cerebral haemodynamic effects of early blood pressure lowering after TIA and non-disabling stroke in groups potentially at risk of hypoperfusion

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Background and aims: Effects of early blood pressure (BP) lowering on cerebral haemodynamics after transient ischaemic attack (TIA) and non-disabling stroke are uncertain, particularly in groups potentially at risk of hypoperfusion, such as patients aged⩾80 years or with carotid stenosis. We measured changes in transcranial Doppler (TCD) indices in these subgroups undergoing BP-lowering early after TIA/non-disabling stroke.
Methods: Among patients attending a rapid-access clinic with TIA/non-disabling stroke, those with BP⩾140/90 underwent early BP-lowering if without bilateral severe carotid/middle cerebral artery (MCA) stenosis/occlusion. BP, End-tidal CO_2 and MCA TCD velocities were measured at baseline and at one-month and compared between patients with ⩾50% extra-cranial carotid stenosis vs without, and in patients aged ⩾80 years vs younger in those without stenosis.
Results: Of 739 patients, 42 with ⩾50% carotid stenosis did not undergo endarterectomy/stenting. In this group, mean/SD systolic blood pressure (SBP) was reduced from baseline to one-month by 6.90/18.10 mmHg (p=0.01) without reduction in end-diastolic velocity (EDV; mean/sd change=+0.44/6.13 vs +0.77/7.26 cm/s in patients without stenosis, p_{diff}=0.34). Among 117 patients without carotid stenosis aged ⩾80 years, reduction in mean/sd SBP of 13.7/25.0 mmHg coincided with an increase in EDV of 1.09/5.20 cm/s. Changes in SBP and EDV were similar to those in 580 younger patients (both p_{diff}>0.35).
Conclusions: Early BP-lowering after TIA/non-disabling stroke did not reduce TCD velocities, irrespective of age or presence of moderate/severe carotid stenosis, suggesting that starting antihypertensive treatment at first assessment will not usually lead to hypoperfusion.
Disclosure of interest: No

2355

IMAGING SPECTRUM IN CNS VASCULITIS: PATTERN RECOGNITION AND CLINICAL CORRELATION

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Background and aims: CNS vasculitis presents with varied clinical and radiological manifestations. Pattern based approach with exclusion of other causes helps in arriving at a diagnosis. In our institute, which is tertiary care center, we assessed 250 cases of CNS vasculitis with review of imaging finings and clinical data, with emphasis on assessment of specific patterns.
Methods: In this study, we retrospectively reviewed the vasculitis cases for a period of 3 years between Jan 1st 2019 to Dec 31st 2022. All the patients underwent MRI imaging with contrast study and MRA. Antinuclear and anticytoplasmic antibody profile was assessed in all the cases. Biopsy results were included wherever feasible. Clinical data and demographic profile was tabulated. MRI findings with CT Angiography and DSA were analyzed wherever available.
Results: In our study group, the CNS vasculitis was grouped in primary CNS vasculitis, vasculitis secondary to inflammatory conditions and infectious vasculitis. Among primary CNS vasculitis, the imaging pattern we found was vessel wall enhancement, beaded pattern of vessels with narrowing, secondary Moya Moya pattern, in the background of vasculitic infarcts in watershed territories and microbleeds. Among the vasculitis associated with systemic inflammatory disorders, various patterns were noted including granulomatous nodules, pachymeningitis, optic neuritis, secondary demyelination in the background of microbleeds and basal ganglia infarcts. Tubercular vasculitis involved vessel wall enhancement with vasculitis, streptococcal infection caused internal watershed territory infarcts with microbleeds.
Conclusions: Pattern recognition and correlation of imaging findings with clinical presentation and laboratory results helps in establishing the diagnosis of CNS vasculitis.
Disclosure of interest: No

2466

MRI CHARACTERISTICS AND PREDICTORS OF ISCHAEMIC CAVITY DEVELOPMENT IN ISCHAEMIC STROKE PATIENTS

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Background and aims: In patients after stroke, part of the infarcted tissue can develop into an ischaemic cavity in course of time. The aim of the study is to identify the MRI characteristics of subacute ischaemic lesion that predict the ischemic cavity development.
Methods: Prospective monocentric study on patients with supratentorial acute ischaemic lesion with a negative history of previous stroke. MRI imaging with gadolinium contrast agent was performed 7-12 days and one year after stroke. Ischeamic lesion (region with signal alteration either on FLAIR or on DWI) and ischemic cavity (region with hypo-intense FLAIR and T1w signal) were manually delinated by skilled radiologist and subsequently analyzed by an automatic algorithm.
Results: The data of 103 patients were analyzed (63% men, median age 68 years, median NIHSS 5, 34% received intravenous thrombolysis, in 15% mechanical thrombectomy was done). Median volume of ischaemic lesion in subacute phase was 9.8ml (IQR 25.4ml). In 79 patients (77%), ischaemic cavity was detected on follow-up MRI, with median volume 0.6ml (IQR 3.1ml). Volume of subacute ischaemic lesion correlated with volume of ischeamic cavity (Pearson coefficient 0.56, p<0.001) on follow-up MRI. Median signal intensities on T1w, T2w, FLAIR, ADC, DWI, and SWI on subacute MRI were significantly higher in the region of the ischaemic lesion that develops into an ischaemic cavity on follow-up MRI in comparison with the rest of the subacute lesion.
Conclusions: The volume and intensity of subacute ischeamic lesion on MRI can be used as predictors of ischaemic cavity development.
Disclosure of interest: No

2553

GREY SCALE MEDIAN TO EVALUATE CAROTID PLAQUE ECHOGENICITY FOR PATIENTS ON PCSK9 INHIBITORS

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Background and aims: Carotid plaque composition evaluation and not only grade of stenosis seems to increase accurate stratification of vascular risk for our patients.

Ultrasound provides useful information on plaque composition, and Greyscale Median (GSM) is an objective quantitative measure to evaluate plaque echogenicity.

Some studies have reported GSM changes on carotid plaques under statin treatment but there is lack of data on proprotein convertase subtilisin/kexin type 9 inhibitors (PCSK9i), despite a modifying effect on plaque volume reported on MRA and coronary IVUS studies.

Greater LDL-c reduction with PCSK9i may lead to less lipidic plaques with higher GSM. We aim to evaluate plaque echogenicity among patients on PCSK9i treatment compared to those on statins.

Methods: Case-control study. Patients on secondary prevention for vascular events on statins and/or PSCK9i for at least 6 months. Demographic, clinic and LDL-c values were compared between groups. US evaluation included image postprocesing for GSM.

Results: 242 carotid plaques were evaluated on 122 patients, 70 on PCSK9i (52.9% also on statins). Statin group patients were older and diabetes was more frequent ($p<0.05$). PCSK9i group had significantly lower LDL-c levels (52.8 vs 68.21mg/ml, $p<0.000$). On US evaluation, number, location and qualitative measures of carotid plaques were similar between groups. GSM media was 72.56 (36.4) for PCSK9i vs 69.17 (29.7), p 0.496.

Conclusions: PCSK9i lead to greater LDL-c control, and although echogenicity of carotid plaques was higher on these patients, GSM does not significantly differ from those patients on statins alone.

Disclosure of interest: Yes

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NON-STENOSING INTRACRANIAL ATHEROSCLEROTIC LESIONS IN EMBOLIC STROKE OF UNDETERMINED SOURCE: A VESSEL WALL MRI STUDY

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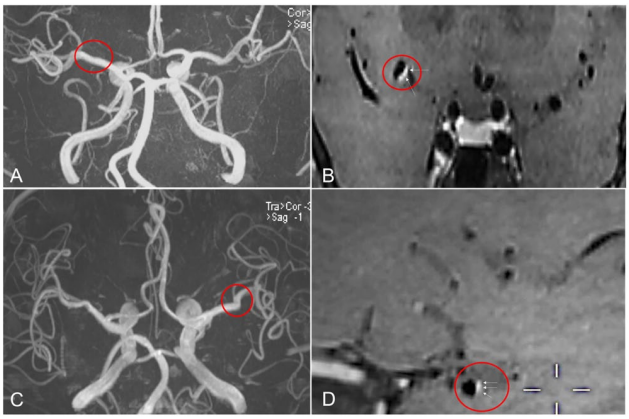
Background and aims: Despite standard diagnostic approach, 30% of ischemic strokes remain cryptogenic, and 50% of them can be classified as embolic stroke of undetermined source (ESUS). Artery-to-artery embolization from non-stenosing complicated atherosclerotic intracranial plaques has been suggest as a potential aetiology of ESUS, often undetected by conventional imaging. Vessel wall MRI (VWMRI) can identify high-risk atherosclerotic plaques and other culprit arterial lesions. However, prospective studies of VWMRI in ESUS patients are lacking. The aim of our study was to define the proportion of ESUS caused by intracranial arteries lesions undetected by luminal-based imaging, clarifying the role of VWMRI in ESUS.

Methods: We prospectively evaluated all consecutive patients with acute ischemic stroke admitted to IRCCS Mondino Stroke Unit from July 2022. All patients underwent standard diagnostic workup including CT angiography of intracranial and epiaortic vessels, transthoracic echocardiogram, and 72h ECG monitoring. Patients with multi-territory strokes were excluded. All patients respecting ESUS criteria without contraindication to MRI were included in the study and underwent VWMRI with gadolinium contrast agent administration within 1 month.

Results: The first 20 patients have been enrolled in the study. VWMRI revealed culprit intracranial vessels lesions in the involved vascular territory in 40% (n=8) of patients. Particularly, 7 patients had non-stenotic complicated atherosclerotic plaques with contrast enhancement; 1 patient had an intracranial vertebral artery dissection.

Conclusions: VWMRI revealed culprit lesion in a significant proportion of ESUS patients with a single vascular territory involvement. Our preliminary data suggest the importance of VWMRI in the diagnostic workup of ESUS.



Disclosure of interest: No

779

Accuracy of visual MRI analysis in determining stroke etiology

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Background and aims: Stroke infarct patterns on MRI may provide clues to the underlying etiology. Previous studies analyzing MRI patterns however have analyzed patients with a confirmed etiology or a cryptogenic source.

The accuracy of visual MRI analysis to determine infarct etiology, without reference to clinical information or investigation results, is unknown. In this study, we aim to determine the accuracy of unaided visual MRI analysis in classifying ischemic strokes as due to a CE or other source.

Methods: A random sample of 200 patients was obtained from a stroke registry at a comprehensive stroke centre in Australia. Of these, 100 patients had a confirmed CE source and 100 had another stroke etiology. Patients with a cryptogenic stroke were excluded. Five blinded neuroradiology experts were each given 40 MRI images to analyze and label as having a CE or other source.

Results: There were no significant differences in baseline variables between patients with and without a CE source. Of the 200 patients, 111 (56%) were correctly classified by the assessors. The median accuracy was 55%. Accuracy ranged from 47.5% to 65%. The most common reason for misclassification was correlating lacunar infarcts with a non-CE etiology.

Conclusions: Unaided visual analysis of MRI performs poorly in classifying ischemic stroke as due to a CE or other source. This may be due to assumptions made about infarct patterns and the underlying etiology. Future studies may seek to compare the performance of humans with artificial intelligence algorithms in classifying stroke etiology based on MRI.

Disclosure of interest: No

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CLINICAL CORRELATES OF RECENT PREMORBID CANCER IN A CONSECUTIVE SAMPLE OF INDIVIDUALS WITH ACUTE ISCHEMIC STROKE

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Background and aims: Occult active cancer is an aetiological risk factor for ischemic stroke (IS). The optimal cancer screening strategy in IS remains unknown, partly because of the lack of reliable predictors to help adapt investigations. We aimed to identify clinical features associated with recent premorbid cancer in people with IS to help predict occult cancer.

Methods: We reviewed admissions for IS at our institution between August 2018 and December 2020. Recent cancer was defined as any new cancer <5 years or any known cancer undergoing treatment <6 months preceding IS. We compared clinical features with Fisher and chi-squared tests for categorical data, as well as t-tests and Mann-Whitney U tests for continuous data. We defined statistical significance as $p<0.05$.

Results: We included 370 individuals without recent cancer and 44 with recent cancer (adenocarcinoma: 36%). The median time from cancer diagnosis to IS was 14.5 months (IQR: 8.7, 25.7). People with recent cancer, as compared to people without recent cancer, had a significantly lower haemoglobin (median: 126 vs 135 g/L; $p<0.001$), lower albumin (median: 35.5 vs 37.0 g/L; $p=0.003$), higher fibrinogen (median: 4.6 vs 3.9 g/L; $p=0.038$), and a greater prevalence of prior venous thrombosis (13.6% vs 1.1%; $p<0.001$) and atrial fibrillation (34.1% vs 17.6%; $p=0.009$).

Conclusions: We identified three laboratory features (haemoglobin, albumin, fibrinogen) and two prevalent conditions (venous thrombosis, atrial fibrillation) that are associated with recent premorbid cancer in people with IS. Additional studies to assess their predictive performance for occult cancer in IS are needed.

Disclosure of interest: No

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HOW NEUROLOGISTS SCREEN FOR OCCULT CANCER IN ACUTE ISCHEMIC STROKE: A RETROSPECTIVE SINGLE-CENTRE STUDY

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Background and aims: Active cancer is diagnosed in the months following stroke in ~1-2% of people with ischemic stroke (IS). The optimal cancer screening strategy in IS, however, remains unknown. We aimed to assess the current cancer screening approach in IS patients.

Methods: We reviewed admissions for IS at our institution between August 2018 and December 2020. We defined limited screening as a review of risk factors and symptoms of malignancies, a general physical examination, and a review of prior recommended cancer screening. Extensive tests were defined as i) a cancer screening test falling outside guidelines, or ii) any chest, abdomen or pelvis computed tomography or positron emission tomography (regardless of indication). We compared 19 known clinical predictors of occult cancer in IS among people who underwent limited screening with versus without subsequent extensive tests, using Fisher and Mann-Whitney U tests. We defined statistical significance as $p<0.05$.

Results: We included 375 individuals with IS (mean age: 68.7 years; SD: 15.4). Limited cancer screening was performed in 230 individuals (61.3%), of which 78 (33.9% among limited screening) had subsequent extensive tests. Only prevalent chronic obstructive pulmonary disease (COPD) was associated with extensive tests following limited screening (17.9% vs 7.2%; $p=0.023$).

Conclusions: Known predictors of occult cancer in IS were not associated with more extensive cancer screening tests, except for COPD. We did not account for the indication of extensive tests, which may have biased our results towards the null. Validated clinical prediction models may help clinicians guide cancer investigations in IS.
Disclosure of interest: No

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Diagnostic accuracy of plasma biomarkers in predicting cardioembolic stroke

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Background and aims: Plasma biomarkers have shown some potential in identifying cardioembolic stroke, which is essential to ascertain the right course of treatment. In this study, we aim to evaluate the accuracy of brain natriuretic peptide (BNP), N-terminal-proBNP (NT-proBNP) and troponin I in predicting atrial fibrillation (AF).
Methods: We included 717 consecutive patients admitted to our Stroke Unit with a diagnosis of ischemic stroke between January 2020 and January 2022. We evaluated retrospectively ECG monitoring⩾48h and troponin I, BNP and NT-proBNP levels available in the acute phase.
Results: From our sample of 717 patients, 583 had no previous diagnosis of AF. From these, 23.7% had a high troponin on admission (120/507), 38.0% had high BNP (164/432) and 35.8% had high NT-proBNP (24/68). From those with high troponin at admission, 35.8% were found to have AF (RR=2.2; 95% CI=[1.6;3.0]), with a specificity of 81.0% and a sensitivity of 40.1%, with area under the ROC curve (AUC) of 0.69. From those with high BNP, 41.5% were found to have AF (RR=4.8; 95% CI=[3.1;7.4], with a specificity for AF detection of 71.8%, and a sensitivity of 74.7%, with AUC of 0.73. From those with high NT-proBNP, 47.5% were found to have AF (RR=4.5; 95% CI=[1.6;12.8], with a specificity for AF detection of 73.6%, and a sensitivity of 71.8%, with AUC of 0.72.
Conclusions: These biomarkers can be useful for early identification of cardioembolic stroke, with BNP and NT-proBNP having a higher sensitivity but lower specificity than troponin I.
Disclosure of interest: No

1532

The association of high-density lipoprotein cholesterol with cancer related stroke

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Background and aims: Cancer-related stroke is thought to share pathogenesis with cancer-related venous thromboembolism (VTE). Low levels of high-density lipoprotein cholesterol (HDL-C) have been found to be associated with VTE. This study aimed to investigate whether HDL-C is associated with cancer-related stroke.
Methods: Among the consecutively registered patients in the acute stroke registry between January 2019 and October 2021, 540 patients with confirmed mechanisms were included. They were divided into 3 groups according to stroke mechanism and presence of active cancer: cancer-related stroke group (n=48), conventional mechanism with active cancer (n=54), and conventional mechanism without active cancer (n=438). The conventional mechanism was for patients with large artery disease, small artery disease, and cardioembolism according to the TOAST classification. Cancer-related stroke was determined according to image findings and laboratory findings. Laboratory findings including HDL and clinical factors were compared between groups.
Results: The mean levels of HDL-C were significantly lower in a patient with cancer-related stroke than those with a conventional mechanism with cancer or conventional mechanism without cancer (36.5±14.0 vs. 40.8±11.8 vs. 43.2±12.5, p=0.003). There was no difference between groups in lipid parameters other than HDL.The HDL-C level (OR 1.033 per 1 mg/dL decrease; 95% CI 1.001-1.065; P=0.046) was independently associated with cancer-related stroke mechanism.
Conclusions: Patients with low levels of HDL-C have an increased risk of cancer-related stroke. In the future, a prospective study is needed to find out if HDL-C reduction increases the risk of stroke in cancer patients.
Disclosure of interest: No

1708

Stroke mimics: prevalence and main characteristics

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Background and aims: Stroke mimics (SM) are non-vascular medical conditions that simulate stroke symptoms. Our aim is to describe prevalece of SM in our patients and analyze their main features.
Methods: We retrospectively reviewed patients admitted with suspected acute vascular event between may 2017 and april 2020 and we analyzed their main demographics, NIHSS score at admission, code stroke activation and diagnosis at discharge.
Results: 1122 pacients were included: 805 acute ischaemic stroke (AIS), 145 transient ischemic attack (TIA) and 172 received a non neurovascular diagnose at discharge.
54% were women, mean age was significatively lower (59 years) than TIA (69 years) and AIS (68 years) patients (p<.001). Mean NIHSS at admittance was 2 (0-26), significatively lower than AIS patients (6 [0-32]) (p<.001). Code stroke was activated for 53 pacients: 9 received intravenous thrombolysis, without any haemorrhagic complication.
Most frequent diagnosis were: migraine (11,6%), seizures (10%), hypertensive encephalopathy (8%), myelopathy (6%) and space-occupying lesions (6%).
In 26.7% an organic etiology was not found.
Conclusions: SM can be a diagnostic challenge. Mean age and mean NIHSS score were significatively lower in SM patients. 15% of our suspected stroke patients were stroke mimics. Code stroke was activated in 30.8%, 16.9% of them received thrombolysis. While migraine and seizures were the most frequent diagnoses at discharge, in 26,7% of patients an organic cause was not found.
Disclosure of interest: No

2212

ATRIAL FIBRILLATION DETECTION RATE IN CRYPTOGENIC ISCHEMIC STROKE: COMPARATIVE STUDY BETWEEN IMPLANTABLE LOOP RECORDERS AND EXTERNAL RECORDERS

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Background and aims: Cryptogenic stroke, accounting for 10-40% of ischemic stroke, is defined as a cerebral infarction for which no definite cause is identified after a complete diagnostic work-up. Among the multiple potential causes, atrial fibrillation (AF) stands as an important etiological factor which has to be actively searched for, with rates reaching up to 20-30%

Methods: Ongoing study comparing AF detection rates between implantable loop recorder (ILR) vs external recorder (ER) devices for long-term cardiac rhythm monitoring in cryptogenic ischemic stroke in our hospital.

Results: 172 patients were included: 97 ILR, 75 ER. Mean age 67.2±11.6 (ILR) vs 63.9±13.9 years (ER). Mean CHA_2DS_2-VASc 4.45±1.7 vs 3.96±1.6. AF was detected in 34% (n=33) in ILR vs 2.7% (n=2) in ER group. Interval between stroke and device implantation: 41.7±57.14 (ILR) vs 134.98±79.9 days (ER). Interval between stroke and AF detection: 120±72 (ILR) vs170±48 days (ER). AF detection supposed a change of treatment in 85.71% (30/35 cases). We identified an association with 4 factors: medium/high supraventricular extrasystole rate (80%, $p>0.000$), age⩾75 years (50%, p=0.044), left atrial enlargement (50%, p=0.039) and CHA_2DS_2-VASc >4 (43.5%, p=0.062). We defined a risk scale (0-4 points) with AF detection rates ranging from 13.9-100% depending on the scores obtained.

Conclusions: AF was detected in a relatively high percentage of long-term cardiac rhythm monitoring in cryptogenic stroke patients. In our series, ILR was clearly superior to ER. It is important to perform a thorough etiological research in cryptogenic stroke as it may have therapeutic and prognostic implications.

Disclosure of interest: No

2320

Can gaze preference predict outcome in supratentorial intracerebral hemorrhage?

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Background and aims: Gaze deviation is a well-known finding in intracerebral hemorrhage (ICH) but its implications continue to be vague. This study aimed to determine whether gaze deviation on initial brain CT scan adds further prognostic value for outcome prediction in patients with supratentorial ICH.

Methods: This was a multi-center retrospective cohort study which utilised a non-probability consecutive sampling technique to include all patients diagnosed with ICH from May, 2016 to June, 2020 in King Abdulaziz Medical City, Jeddah, Saudi Arabia and King Abdulaziz Medical City, Riyadh, Saudi Arabia. Initial brain CT scans were reviewed to assess the degree of gaze deviation. Patients were divided into two groups with one having gaze deviation of ⩾ 5° and the other having deviation of <5°.

Results: Our cohort included 224 patients diagnosed with ICH; out of whom 20% had gaze deviation <5°. Patients with gaze preference of 0-4° had significantly higher mean age. As opposed to patients with <5° gaze preference, median ICH size, ICU admissions, surgical interventions, hydrocephalus, intraventricular extension, and mortality were significantly more common in patients with 5-15° gaze preference. However, as it pertains to the ICH location, no significant difference was seen between the two groups. Gaze preference ⩾ 5° was a strong predictor of mortality based on multivariate logistic regression after adjusting for other variables.

Conclusions: Gaze preference ⩾ 5° on initial brain CT scan is a sign that is associated with poor outcomes.

Disclosure of interest: No

2335

HIGHLY PREDICTIVE PARAMETRIC MODEL TO DETECT HIDDEN ATRIAL FIBRILLATION IN PATIENTS WITH STROKE OF EMBOLIC PROFILE OF UNDETERMINED CAUSE

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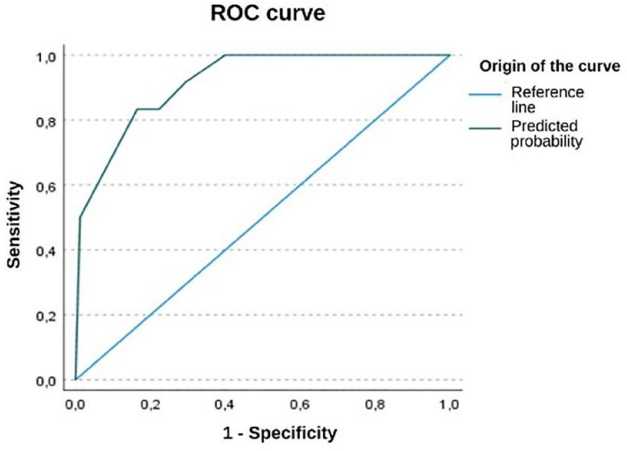
Background and aims: Early prolonged cardiac monitoring in ESUS patients is recommended to detect hidden atrial fibrillation (AF), unfortunately, it is not always possible to perform it quickly. We developed a patient profile at high risk of hidden AF using the data obtained in the FANTASTIC Study (Untreated atrial fibrillation screening following stroke in Andalusia).
Methods: Multicentre, prospective study of 30-day prolonged cardiac monitoring in ESUS patients in Andalusia (Spain). Monitoring in the first 7 days after stroke with Holter Bittium Faros 360 (Apoplex) and analysis with SRA program, which detects AF and/or the risk of developing AF. A parametric model is used to predict the risk of detecting hidden AF using clinical, biochemical, and electrocardiographic findings.
Results: 106 patients were included, with an AF detection rate of 13.2% (14). Comparing patients with and without AF, significant differences were obtained in ages older than 70 years (93.2% vs. 40%, $p<0.001$), female (64.3% vs. 26.1%, p=0.010), AF risk profile in the first two hours of monitoring (92.3% of patients with "high AF risk" were eventually detected AF; $p<0.01$%) and NT-proBNP> 125pg/mL (71.4% vs. 33.7%, p=0.016). The multiparametric model including age, sex, and risk profile in the first 2h of monitoring obtained an AUC of 0.917 (CI 0.846-0.988) with 83.3% sensitivity and 83.5% specificity.
Conclusions: Women older than 70 years with a two-hour tracing compatible with a high risk of hidden AF have a high probability of developing AF after an ESUS and would benefit from early initiation of prolonged cardiac monitoring.



Disclosure of interest: No

2641

FACTORS ASSOCIATED WITH STROKE SEVERITY IN PATIENTS WITH CANCER: A CASE AND CONTROL STUDY

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Background and aims: Stroke and cancer have a close relationship in terms of burden disease and pathophysiology. The aim of this study is to characterize the factors associated with the severity of stroke in patients with and without cancer, in order to clarify the "red flags" that redirect the etiological suspicion of stroke to the presence of occult cancer.
Methods: A case-control study was conducted in 390 patients who were hospitalized at Fundación Santa Fe de Bogotá from 2015 to 2020. The primary outcome was the presence of a severe stroke and the main exposure was a history of active cancer. Two secondary outcomes were included: mortality and mRankin at 90 days post stroke. A multivariate model and a survival analysis was performed.
Results: Patients with severe stroke had a greater multiple territory involvement (23.26%) with a p value < 0.005 compared to those with less severe stroke (8.88%). Furthermore, the group with severe stroke had a higher level of D-Dimer value (3321 µg/dl). Multivariate analysis found that patients with active cancer were 2.92 times more likely to die at 3-month follow-up. Finally, it was observed that from day 45 post stroke, survival was reduced compared to the control group.
Conclusions: No difference was found between patients with and without cancer in NIHSS or Glasgow score; however, cancer patients had a higher risk of mortality or severe disability at 90 days of follow-up. High levels of D-dimer could be considered a red flag for a worse mid-term outcome.
Disclosure of interest: No

PROGNOSIS AND OUTCOME AFTER STROKE

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Pre-Stroke Statin Use Is Associated with Mild Neurological Deficits at the Onset of Acute Ischemic Stroke

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Background and aims: Pre-stroke statin use reduces infarct size. Therefore, this retrospective study aimed to investigate whether pre-stroke statin use is associated with mild neurological deficits (mND) at the onset of acute ischemic stroke (AIS).
Methods: We included patients with AIS admitted to our institution within 24 h of stroke onset between 2011 and 2019. We collected data on age, sex, pre-stroke use of statins, the National Institutes of Health Stroke Scale (NIHSS) score, serum biomarker levels, and stroke subtypes at admission. In addition, we defined mND as an NIHSS score $\leqslant 3$ points. We conducted a logistic regression analysis using variables for pre-stroke statin initiation, calculated the propensity scores for pre-stroke statin use and implemented propensity score matching (PSM). Finally, we used the McNemar test to evaluate whether pre-stroke statin administration significantly affected mND.
Results: Of 4370 patients, 2615 met our inclusion criteria. Among the 594 patients with pre-stroke statin use, 308 presented with mND. After PSM, 555 patients received pre-stroke statin treatment, while 286 patients with pre-stroke statin use presented with mND at admission ($p = 0.0411$). The binary-matched pairs contingency table of mND was not symmetrical ($p = 0.0385$).
Conclusions: Pre-stroke statin use is associated with mND at the onset of AIS.
Disclosure of interest: No

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THE UTILITY OF NIHSS/POST-ICTUS INDEX AS PREDICTOR OF OUTCOMES IN STROKE PATIENTS WITH SURGICAL DECOMPRESSION IN A TERTIARY HOSPITAL FROM 2010 TO MARCH 2022: A RETROSPECTIVE SINGLE CENTER STUDY

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Background and aims: Decompressive craniectomy comes second with the management in massive acute strokes. This study aimed to develop a bedside tool: the ratio of NIHSS to the timing of admission and surgery as index in patients who would likely benefit the surgical intervention.
Methods: All stroke charts with surgical decompression at a tertiary hospital were reviewed retrospectively from 2010-2022. NIHSS/Post-Ictus (NPI) indices defined as the ratio of the NIHSS Score to time to admission and operation we computed and were compared to hospital outcomes – in-hospital mortality, ICU stay, hospitalization and MRS 30 days after surgery.
Results: NPI indices on admission and operation demonstrated the best prediction accuracy with regards to infarct mortality with AUC 0.5423 [95% CI 0.003-1.030]; and AUC 0.5634 [95% CI 0.001-1.012], respectively. As with the indices in bleed mortality with AUC 0.6542 [95% CI 0.002-1.031] on admission; and AUC 0.7321 [95% CI 0.005-1.164] on operation. Identified cut off value as predictors for mortality are as follows: NPI infarct group (admission/operation) $<2/<0.29$; In bleed group, NPI (admission/operation) $<2.2 /< 0.94$.
The infarct NPI index of admission demonstrated the best prediction accuracy with regards to MRS with AUC 0.5745 [95% CI 1.0493 -1.7868]. An NPI index of <2.11 predicted poor MRS 30 days post-surgery.
Conclusions: We presented a feasible, bedside index that could determine in-hospital outcomes in massive stroke with surgical indication. The NPI indices (admission and operation) demonstrated to be a good predictor of mortality in stroke patients (infarct and bleed) and functional capacity in infarct group.
Disclosure of interest: No

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Long-term functional outcomes after cerebral venous thrombosis: a systematic review

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Background and aims: Cerebral venous thrombosis (CVT) is a rare disease predominantly affecting a young, often working age population. Although considered to carry a good prognosis, the long-term functional outcomes of CVT have not been well defined. We aim to systematically review current knowledge regarding the long-term functional outcomes in adult patients following CVT.
Methods: We searched MEDLINE, CINAHL, SCOPUS, and PsycINFO, and backward citations for selected studies published between database inception and 21/01/2022. Cohort and case-control studies, and randomised-controlled trials which reported a functional outcome measure at a mean/median follow-up of $\geqslant$12 months were included.
Results: 9259 records identified, 107 texts screened for eligibility and 30 included. Mean/median follow-up ranged from 12 months to 135 months. All studies used modified Rankin Scale (mRS) in reporting outcomes. 15 studies reported other outcome measures in addition to mRS including 7 describing vocational status. 25 studies reported over 80% of patients achieving mRS 0-2, 8 reporting additional outcome measures of which 4 studies reported between 18% and 75% frequency of residual impact based on scoring tools including Beck Depression Inventory, Fatigue Severity Scale, Center for Epidemiologic Studies Depression Scale, Stroke Specific Quality of Life Scale, and EuroQol-5 Dimension.
Conclusions: Despite studies of long-term outcomes after CVT frequently reporting mRS, few studies report on cognitive, mood, and other neuropsychiatric sequelae, nor measures of quality of life or vocational status. Existing studies may not adequately reflect patient-centred outcomes. There is a need for including such measures in future studies of outcomes after CVT.
Disclosure of interest: No

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PARADOX EFFECT OF FOLLOW-UP DIASTOLIC BLOOD PRESSURE ON STROKE RECURRENCE ACCORDING TO THE LEPTOMENINGEAL COLLATERAL STATUS IN PATIENTS WITH SYMPTOMATIC INTRACRANIAL ATHEROSCLEROTIC STENOSIS

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Background and aims: Limited data were available regarding the optimal diastolic blood pressure (DBP) level for secondary stroke prevention in patients with symptomatic intracranial atherosclerotic stenosis (sICAS). We aimed to investigate the association between DBP levels and stroke recurrence in sICAS patients, and the possible interaction with the baseline leptomeningeal collateral (LMC) status.
Methods: In this cohort study, patients with anterior-circulation sICAS (50-99%) confirmed by CTA were included. Good or poor LMC status was defined by the laterality of the distal vessels in bilateral anterior and posterior cerebral artery territories. Mean DBP at regular follow-ups during 1 year (DBP_{FU}) was obtained. Cox regression analyses were conducted to investigate the association between DBP_{FU} and the primary outcome (same-territory ischemic stroke recurrence within 1 year), and the LMC-DBP_{FU} interaction on the outcome.
Results: Among 141 sICAS patients (median age 62 years; 94 (66.7%) males), 65 (64.1%) had good baseline LMCs, the median DBP_{FU} was 85mmHg. DBP_{FU} was not significantly associated with the primary outcome (p=0.793). Lower DBP_{FU} was associated with a lower risk of the primary outcome in patients with poor LMCs (HR for every 10mmHg decrement 0.47; 95%CI, 0.22-1.00; p=0.051), but a higher risk among

those with good LMCs (2.01; 1.06-3.80; 0.032). There was significant LMC-DBP_{FU} interaction on the primary outcome (p=0.025).
Conclusions: Lower long-term DBP may be associated with an increased risk of same-territory stroke recurrence in sICAS patients with good LMCs. Studies are needed to reveal the mechanisms, for instance, the role of cerebral autoregulation, underlying such associations.
Disclosure of interest: No

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Admission hyperglycemia, stroke subtypes, outcomes in acute ischemic stroke

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Background and aims: Whether admission hyperglycemia is differentially associated with early vascular outcomes in acute ischemic stroke (AIS) depending on stroke subtype has incompletely delineated.
Methods: In a multicenter, prospective stroke registry, patients with AIS were categorized based on admission glucose levels into normoglycemia, moderate hyperglycemia, and severe hyperglycemia (<140mg/dl, 140-179mg/dl, and ⩾180mg/dl, respectively) groups. Multivariate analysis assessed the interaction between the hyperglycemia and ischemic stroke subtypes of large artery atherothrombosis (LAA), cardioembolism (CE), and small vessel occlusion (SVO) and early vascular outcomes (3-month stroke, all-cause mortality, and composite of stroke, MI, and all-cause mortality). We also investigated the effect modification between stroke subtypes and admission glucose groups and additionally the presence of DM (3-way interaction).
Results: Among the 32,772 patients (age;69.0±12.6yrs, male;58.4%) meeting eligibility criteria, 61.9% were in the normoglycemia, 19.5% in the moderate hyperglycemia group, and 18.7% in the severe hyperglycemia groups. Substantial interactions between hyperglycemia groups and stroke subtypes were observed for 3-months all-stroke ($P_{interaction}$=0.003) and composite of stroke, MI, and all-cause mortality ($P_{interaction}$=0.001), with differential recurrence strongest among CE, intermediate among LAA, and least among SVO. These interactions were consistent regardless of the presence or absence of DM.
Conclusions: Hyperglycemia was differently associated with the risk of 3-months all-stroke by ischemic stroke subtypes. The associations of hyperglycemia with 3-month all-stroke were greatest in CE subtype, but not in SVO subtype. These results suggest that the effect of glucose-lowering treatment after AIS may differ according to stroke subtypes.
Disclosure of interest: No

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National Institutes of Health Stroke Scale Items as predictor of modified Rankin Scale at 3 months

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Background and aims: There is no consensus whether individual items of the National Institutes of Health Stroke Scale (NIHSS) have same weight for explaining level of global disability after stroke. We therefore aimed to study how the individual items of NIHSS at admission relate with modifed Rankin Scale (mRS) levels three months after stroke.
Methods: This cross sectional and retrospective register-based study included patients with acute stroke in three Swedish stroke units from November 2014 to August 2018, with available NIHSS at admission and mRS at three months follow-up. The explanatory variables where NHISS items, outcome variable mRS, and excellent outcome defined as mRS ⩽1p.
Results: We included 1471 patients, mean age was 72 years, 48 % were female and 66 % had mild strokes (NIHSS ⩽ 3). In adjusted binary logistic regression analysis, the NHISS items impaired right motor arm and leg, and impairment in visual field, reduced the odds of excellent outcome at three months (OR 0.60 (95% CI: 0.37-0.98), OR 0.60 (95% CI: 0.37-0.97), and OR 0.65 (95% CI: 0.45-0.94) respectively). When exploring the strength of the relationship between NIHSS items and mRS ⩽1p, orientation, language, and right leg motor had the strongest correlation, explaining 41 %, 36 % and 33 % of the variance in an unadjusted model.
Conclusions: The NIHSS items right motor symptoms and visual field at admission reduced the odds of functional independence post-stroke. However, the individual NHISS items explained only a small portion of the variance in outcome post-stroke.
Disclosure of interest: No

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OUTCOMES OF THROMBOLYSIS TREATMENT AMONG MINOR ACUTE ISCHEMIC STROKE PATIENTS: DATA FROM A STROKE CENTER IN VIETNAM

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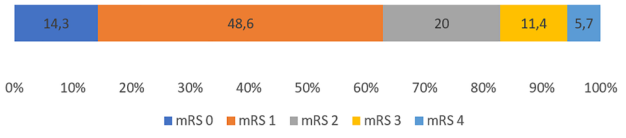
Background and aims: The role of thrombolysis therapy among minor acute ischemic stroke patients (defined as NIHSS score <5) is controversial. This study aimed to assess the outcomes of minor AIS patients receiving thrombolysis at Bachmai stroke center.
Methods: A cross-sectional study was conducted at Bachmai stroke center from June 2021 to September 2022. The enrolled patients had NIHSS scores ⩽4 at admission and were treated with alteplase within 4.5 hours from the onset due to disabling or progressive symptoms. The outcomes were the rate of excellent function (mRS 0-1) and disability (mRS ⩾2). Multivariate regression analysis was performed to find out the predictors of disability after 90 days.
Results: During the study period, 35 minor AIS patients received thrombolysis treatment (mean age: 64.7 ± 10.8, male: 80%). The median NIHSS score at admission was 4 (2-4). Intracranial artery stenosis (ICAS) was presented in 11 (31.4%) patients. 3 patients (8.6%) had transformation hemorrhages. However, all of them were classified as HI 2 level. After 3 months, 22 (62.9%) patients got excellent outcomes (mRS 0-1). The other 13 patients were left with some degree of disabling symptoms (mRS ⩾2) (Figure 1). The multivariate regression model revealed that ICAS independently related to 90th-day disability (OR 29.1, p=0.03).

Figure 1: 90th-day mRS



Conclusions: Among 35 mild ischemic stroke patients receiving thrombolysis, excellent outcomes were seen in 62.9%. Patients with some degree of disability accounted for 37.1%. ICAS was the independent predictor of disability after 90 days.
Disclosure of interest: No

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Cardiac Troponin and Short-term Cardiovascular Outcomes following Acute Ischemic Stroke

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Background and aims: An elevated high-sensitivity troponin T (TnT) signifies cardiac damage and is correlated with an increased risk of cardiovascular disease. However, there is a lack of information regarding whether TnT predicts major adverse cardiovascular events (MACE) following acute ischemic stroke. This study aims to elucidate the relationship between TnT and MACE in patients with acute ischemic stroke.
Methods: The patients who presented within seven days of stroke onset underwent neurological examination, imaging tests, and blood tests including plasma brain natriuretic peptide and TnT upon admission. We investigated predicting factors of MACE (heart failure, ischemic stroke, acute coronary syndrome, and vascular death) and heart failure between seven days after index stroke and three months using logistic regression analysis.
Results: Among the 1246 patients, MACE and heart failure occurred in 70 and 23 patients, respectively. The highest quartile of TnT (>0.030 ng/mL) was an independent predictor of MACE (odds ratio [OR], 2.04; 95% confidence interval [CI], 1.09-3.50; p=0.010) and heart failure (OR, 3.95; 95%CI, 1.50-10.36; p=0.005). In the prediction of MACE, the addition of the highest quartile of TnT to the National Institutes Health of Stroke Scale score at admission and CHA2DS2-VASc score improved the c-statistics from 0.692 to 0.711. The c-statistics for predicting heart failure were improved from 0.660 to 0.833 after adding the highest quartile of TnT to the history of heart failure and the subtype of cardioembolism.
Conclusions: Elevated TnT level on admission may be associated with an increased incidence of cardiovascular events after acute ischemic stroke.
Disclosure of interest: No

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EXPLORING THE BIDIRECTIONAL ASSOCIATIONS BETWEEN DEPRESSIVE SYMPTOMS AND FUNCTIONAL LIMITATIONS IN THE FIRST YEAR AFTER STROKE: THE BASIC STUDY

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Background and aims: Depression and functional disability are among the most common sequelae of stroke. This study investigates the longitudinal associations between functional limitations and depressive symptoms, and vice versa, during the first year after stroke.
Methods: We used longitudinal data from the Brain Attack Surveillance in Corpus Christi project, a population-based stroke study in south Texas, USA. We included validated stroke cases who participated in outcome interviews at 3 months (T1; $N = 1{,}076$), 6 months (T2; $N = 898$), and 12 months (T3; $N = 841$) post-stroke. At each time point, depressive symptoms were assessed using the 8-item Patient Health Questionnaire. Functional limitations were assessed as the average of 7 activities of daily living (ADL) and 15 instrumental ADL. We estimated associations between functional limitations and depressive symptoms at the subsequent assessment (and vice versa) using linear regression controlling for age, sex, race-ethnicity, and the dependent variable at the preceding time point.
Results: Cases were on average 66.39 years old, 47% women, and 58% Mexican American. Greater functional limitations were associated with increased subsequent depressive symptoms (T1 $\rightarrow$ T2: $\beta_{standardised} = 0.144$, $p < .001$; T2 $\rightarrow$ T3: $\beta_{standardised} = 0.204$, $p < .001$). The association between depressive symptoms and subsequent functional limitations was smaller and weakened over time (T1 $\rightarrow$ T2: $\beta_{standardised} = 0.058$, $p = .013$; T2 $\rightarrow$ T3: $\beta_{standardised} = 0.043$, $p < .087$).
Conclusions: These findings suggest potential bidirectional associations between depressive symptoms and functional limitations during the first year after stroke.
Disclosure of interest: No

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The prognostic of deep Earlobe crease in patients with acute ischemic stroke

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Background and aims: Data on earlobe crease (ELC) among patients with acute ischemic stroke (AIS) are limited. We determined the frequency and characteristics of ELC and the prognostic effect of ELC among AIS patients.
Methods: A total of 936 patients with acute AIS were enrolled from December 2018 to December 2019. Patients were divided into without and with ELC, unilateral and bilateral ELC, shallow and deep ELC according to the picture of bilateral ear. Logistic regression models were used to estimate the effect of ELC, bilateral ELC and deep ELC on poor functional outcome at 90 days (modified Rankin Scale score $\geqslant 2$) in AIS patients.
Results: Among 936 AIS patients, 746 (79.7%) patients with ELC. In patients with ELC, there are 156 (20.9%) patients with unilateral ELC and 590 (79.1%) patients with bilateral ELC, 476 (63.8%) patients with shallow ELC and 270 (36.2%) patients with deep ELC. After adjusting for age, sex, baseline NIHSS score, and other potential covariates, patients with deep ELC were associated with a 1.81-fold (odds ratio [OR] 1.81; 95% confidence interval [CI], 1.10-2.96) and 1.62-fold (OR 1.62; 95%CI, 1.13-2.31) increase in the risk of poor functional outcome at 90 days in comparison to those without ELC or shallow ELC.
Conclusions: The ELC was common, and eight of ten AIS patients have ELC. Most of the patients with bilateral ELC, more than one third patients with deep ELC. Patients with deep ELC was independent increased the risk of poor functional outcome at 90 days.
Disclosure of interest: No

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PSICOICTUS: EVALUATION AND PROGNOSIS OF AFFECTIVE AND COGNITIVE DISORDERS AFTER MINOR STROKE

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Background and aims: Minor stroke (MS) is an ischemic stroke that is defined as an episode of focal neurological symptoms that doesn't cause disability and that presents an acute ischemic injury. Despite the few symptoms, most of these patients haven't been included in the treatment trials in the acute phase, although it has been observed that affective and cognitive alterations are complications that can affect functional recovery. Psicoictus project aims to characterize the affective and cognitive profiles in MS patients.
Methods: To accomplish this, a neuropsychological battery was administrated, neuroimaging studies were performed and serum biomarkers were searched by metabolomics/lipidomics approach.
Results: At baseline, were identified 17% patients with affective alterations, 9.3% patients with cognitive alterations and 14.4% patients with both. Patients with cognitive alterations were evaluated by a complete neuropsychological battery being executive functions the most affected cognitive domain. In the analysis of radiological data, it was observed that patients with post-MS cognitive alterations presented bigger volumes of ischemic lesion in the cortical territory of the middle cerebral artery. Patients with affective and cognitive disorders had a higher number of chronic strokes. Non-targeted metabolomics analysis identified 2-hydroxyhexadecanoylcarnitine to be overexpressed in patients with MS and cognitive impairment and Isoleucyl-isoleucine, PC(38:4) and DG(36:7) to have lower concentrations in patients with MS and affective alterations.
Conclusions: Despite presenting mild neurological symptoms, approximately 30% of patients with MS present affective and cognitive alterations, which raises the need to treat them in the acute phase.
Disclosure of interest: No

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Creatinine clearance measured from the 24-hour urine collection and clinical outcomes in stroke patients with atrial fibrillation

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Background and aims: The association between renal function and prognosis after stroke remain uncertain and might be affected by the method of renal function assessment as well as the established antithrombotic therapy for secondary stroke prevention. We investigated the measured creatinine clearance (CrCl) from 24-hour-urine-collection for the prediction of clinical outcomes in stroke patients with atrial fibrillation (AF) under direct oral anticoagulants (DOAC).
Methods: Stroke patients with AF under post-stroke DOAC were enrolled. CrCl was measured by 24-hour-urine-collection and adjusted for body surface area. Multivariate binary logistic analysis assessed the association between one-year mortality, stroke recurrence rate and different CrCl strata (<30, 30-59, 60-89, 90-129, ⩾130 mL/min/1.73m^2).
Results: 469 patients were enrolled. Patients with CrCl 60-89 mL/min/1.73m^2 showed numerically the lowest one-year mortality while patients with CrCl 30-59 ml/min/1.73m^2 had the lowest one-year stroke recurrence rate. After multivariate adjustment, both CrCl <30 ml/min/1.73m^2 and CrCl ⩾130 ml/min/1.73m^2 were associated with increased mortality (odds ratio [OR] 1.92, 95% confidence interval [CI] 1.13-3.27 and OR 3.30, 95% CI 1.48-7.34, respectively), but only CrCl <30 ml/min/1.73m^2 was associated with a higher stroke recurrence rate (OR 7.14, 95% CI 1.35-37.04).
Conclusions: In cardioembolic stroke patients due to AF under post-stroke DOAC, both very low CrCl (<30 ml/min/1.73m^2) and very high CrCl (⩾130 ml/min/1.73m^2) were associated with increased risk of mortality. Only very low CrCl (<30 ml/min/1.73m$^{2)}$ was associated with higher risk of recurrent stroke, indicating unaffected beneficial effects of DOAC for secondary stroke preventions in patients with very high CrCl.
Disclosure of interest: No

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PREDICTORS OF GOOD OUTCOMES IN ELDERLY ACUTE ISCHEMIC STROKE PATIENTS RECEIVING RECANALIZATION THERAPIES: DATA FROM A STROKE CENTER IN VIETNAM

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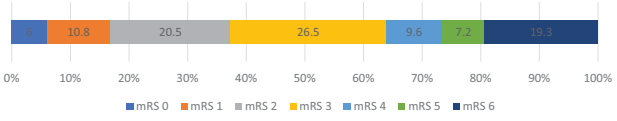
Background and aims: The outcomes of reperfusion therapies in elderly acute ischemic stroke (AIS) patients are insufficiently studied in Vietnam. This study aimed to find out the outcomes and predictors of functional independence after 3 months among elderly AIS patients receiving reperfusion treatments at Bach Mai Stroke Center (BMSC).
Methods: A cross-sectional retrospective study was conducted at BMSC from November 2020 to May 2022. The elderly AIS patients (age ⩾ 80 years old) due to anterior circulation occlusion were treated with intravenous thrombolysis (IVT) and/or mechanical thrombectomy (MT). The primary outcome was the rate of good function (mRS 0-2). Multivariate regression analysis was performed to find out the predictors of good outcomes after 3 months.
Results: 83 patients were recruited (40 males (48,2%); median age 83 (81-86)). The baseline NIHSS and ASPECTS scores were 13 (9-16), and 8 (7-9), respectively. The bridging therapy was applied in 4 (4.8%) patients. The number of MT or IVT therapies alone was 53 (63,9%) and 26 (31,3%), respectively. After 3 months, 31 (37,3%) patients got favorable outcomes (mRS 0-2) (Figure 1). The multivariate regression model revealed that a decrease in NIHSS score ⩾ 4 points after 24 hours of reperfusion treatments independently related to a 90th-day good outcome (OR=6,71; 95%CI: 1,99-22,69; p=0,002).
Conclusions: Among 83 elderly AIS patients treated with reperfusion therapies, good outcome was seen in 37,3%. The decrease in NIHSS score ⩾ 4 points after 24 hours was the independent predictor of a favorable outcome after 3 months.
Disclosure of interest: No

Figure 1: 90th-day mRS



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IMPACT OF POST-STROKE APHASIA ON FUNCTIONAL COMMUNICATION, QUALITY OF LIFE, PERCEPTION OF HEALTH AND DEPRESSION. A CASE-CONTROL STUDY

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Background and aims: To evaluate the impact of post-stroke aphasia on functional communication, perception of quality of life, health, and depressive symptoms.
Methods: Case-control study. Cases: patients with post-stroke aphasia included in the DULCINEA trial (NCT04289493) and healthy people (controls) recruited using snowball sampling. All the subjects completed the following questionnaires: Communicative Activity Log (CAL); Stroke Aphasia Quality of Life Scale (SAQOL-39), General Health Questionnaire (GHQ-12), and Stroke Aphasic Depression Questionnaire (SADQ10). We used Mann-Whitney U Test and provide Cohen's d
Results: We included 11 patients (3 women; mean age 62 years) and 73 controls (42 women; mean age 53.67 years). Patients obtained poorer scores than controls in perception of quality of life (SAQOL-39: mean 54.6 vs. 64.7; U=124, $p<.001$, d=0.61) and in perception of health (GHQ-12: mean 3.36 vs. 1.77; U=124, p=.004, d=0.36). Functional communication [CAL (mean 54.6 vs. 64.7; U= 158, p=.001, d=0.61) and SAQOL-39 communication subscale (mean 2.87 vs. 4.65; U=26, $p>.001$, d=0.94)] and frequency scores (CAL-frequency subscale: mean 54.6 vs. 64.7; U=158, $p>.001$, d=0.61) were significantly lower in the patients. However, there were no differences in perceived quality of communication (CAL-quality subscale: mean 47 vs. 41.9; U=300, p= 0.178). Notably, patients reported fewer depressive symptoms than controls (SADQ-10: mean 10.5 vs. 14.5; U=182, p=.004, d=0.55).
Conclusions: Although communication difficulties impact the quality of life of patients with post-stroke aphasia, their perception of communication quality is similar to that of the healthy and report fewer depressive symptoms.
Disclosure of interest: No

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EXPLORATORY ASSESSMENT OF THE PROGNOSTIC VALUE OF BLOOD β-SYNUCLEIN IN ACUTE ISCHEMIC STROKE

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Background and aims: β-Synuclein is emerging as a novel candidate blood biomarker for synaptic damage in neurological disorders. Here, we aimed to investigate the prognostic role of β-synuclein in patients with acute ischemic stroke in comparison to that of serum neurofilament light chain (NfL) and glial fibrillary acidic protein (GFAP).
Methods: We measured β-synuclein, NfL and GFAP in serum samples from 30 patients with ischemic stroke due to MCA occlusion in the M1 segment collected one day after admission. Inclusion criteria were: pre-event modified Rankin Scale (mRS) 0-2, a clear time window from clinical onset, a National Institute of Health Stroke Scale (NIHSS) score $\geq$6 and/or treatment with mechanical recanalization. We investigated associations of biomarkers with clinical and radiological variables.
Results: Patients with admission and postinterventional ASPECTS <8 showed higher serum β-syn levels (p=0.0006 and p=0.0014, respectively). NfL and GFAP showed similar dynamics. The treatment type (thrombolysis, thrombectomy or both) did not influence serum β-syn levels. Elevated β-syn levels were significantly associated with a lower NIHSS change within 24 hours (p=0.011), death due to neurological complications (p=0.047) and a mRS score $\geq$3 at 3-month follow-up (p=0.015). Patients with mRS 3-6 showed higher NfL (p=0.0011) and GFAP values (p=0.0045) at follow-up than patients with mRS 0-2.
Conclusions: The blood synaptic biomarker β-syn is associated with clinical and radiological measures and shows a promising prognostic value in acute ischemic stroke.
Disclosure of interest: Yes

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NEURAL CORRELATES OF COMA IN STROKES DUE TO BASILAR ARTERY OCCLUSION – A SUPPORT VECTOR REGRESSION BASED MULTIVARIABLE VOXEL-BASED LESION –SYMPTOM MAPPING STUDY

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Background and aims: Wakefulness, is an integral component of consciousness and prerequisite for other brain functions. However its neuroanatomy in humans is poorly understood. Classically, the brainstem "reticular formation" has been considered important for wakefulness. Based on animal models lesions of the pontine tegmentum can result in coma. Lesion based studies on humans assessing the neural sites associated with coma is limited.
Methods: We studied 47 patients with a stroke secondary to basilar artery occlusion. 19 patients had a CGS < 12 and 28 patients had a GCS of > 12 at the time of admission. Support vector regression based multivariable voxel-based lesion-symptom mapping was done to identify the brain regions associated with coma. We next used resting-state functional connectivity from a healthy cohort to identify a network of regions functionally connected to this lesion site.
Results: Injury to the pontine tegmentum and the rostral medial midbrain is significantly associated with coma. These regions include dorsal raphe, locus coeruleus, reticular formation and parabrachial nucleus Isolated thalamic infarcts did not result in coma. However along with these two sites involvement of the medial thalami is associated with a poor functional outcome at 3 months.
Conclusions: In strokes secondary to basilar artery occlusion pontine tegmentum and the rostral medial midbrain involvement is likely to result

in coma and if there is associated medial thalamic involvement a poor outcome can be expected.
Disclosure of interest: No

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Association of timed up-and-go performance with objectively measured life space in patients 3 months after ischemic stroke

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Background and aims: Stroke is a common cause of mobility limitation, including a reduction in life-space, which is defined as the spatial extent in which a person moves within a specified period of time. We aimed to analyze patients' objective and self-reported life-space and clinical stroke characteristics.
Methods: MOBITEC-Stroke is a prospective observational cohort study addressing post-stroke-mobility. We assessed life-space 3 months post-stroke using a portable tracking Global Navigation Satellite System (GNSS) device (7 consecutive days) and by self-report (Life-Space Assessment/LSA). We analysed the timed up-and-go (TUG) test, stroke severity (NIHSS), and the level of functional outcome (modified Rankin Scale) in relation to participants' objective (distance- and area-related life-space parameters) and subjective (LSA-score) life-space by multivariable linear regression analyses, adjusted for age, sex, and residential area.
Results: We included 41 ambulatory patients (mean age 70.7 years, 29.3% female). In multivariate analyses, we observed a positive relationship between TUG-performance and maximum distance from home ($p = 0.006$), convex hull area (i.e. area enclosing all GNSS-fixes, linking the outermost points; $p = 0.009$), perimeter of the convex hull area (i.e. total length of the boundary of the convex hull area; $p = 0.008$), as well as the standard ellipse area (i.e. the two-dimensional ellipse containing approximately 63% of GNSS-points; $p = 0.023$).
Conclusions: The TUG, an easily applicable test, seems to be a useful indicator for patients' life-space 3 months post-stroke and may be a clinically useful measure to document the motor rehabilitative process.
Disclosure of interest: No

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The Impact of Muscle and Fat on dementia after stroke

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Background and aims: We investigated whether the volume and activity of muscle or fat are related to dementia development after stroke.
Methods: Between August 2015 and February 2020 acute cerebral infarction patients who admitted to Chung-Ang University Hospital underwent whole body fluorodeoxyglucose positron emission tomography after patients had been stabilized. We measured muscle and fat area at umbilicus level from computed tomography. We also measured standardized uptake value (SUV) of visceral and subcutaneous fat at umbilicus level, and the mean SUV of both psoas muscles. Dementia was diagnosed when a patient or caregiver complained of cognitive decline which hampers everyday life and objective neuropsychological test confirmed decreased cognitive function.
Results: A total of 110 stroke patients were recruited, but 108 patients (mean age=72 years) were finally analyzed after excluding two active cancer patients. 13 patients had already diagnosed with dementia before index stroke and 19 patients developed dementia after stroke. The patients with dementia had significantly decreased abdominal muscle index and increased glucose uptake from visceral fat. The glucose uptake at visceral fat was inversely associated with body mass index (r=-0.329, p=0.001), bone mineral density in spine (r=-0.265, p=0.006) and fat index (r=-0.436, $p<0.001$). Cox regression model including age, carotid stenosis, neurological severity and laboratory variables showed that the patients with elevated metabolism in the visceral fat were independently associated with dementia after stroke.
Conclusions: Increased glucose uptake at visceral fat was independently associated with post-stroke dementia. Whether this phenotype is a modifiable risk factor warrants future study.
Disclosure of interest: No

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PREDICTION OF TISSUE OUTCOME IN STROKE PATIENTS WITH ENDOVASCULAR THROMBECTOMY USING A GENERALIZED LINEAR MODEL

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Background and aims: Endovascular thrombectomy as a treatment option for acute stroke in the extended time window (6-24 hours) has improved the prognosis of patients with potentially salvageable tissue. To estimate this, the most common way is the application of thresholds to perfusion imaging data. This method, however, has certain drawbacks, as it is limited to one modality and does not take interactions between variables into account.
Methods: We implemented a multiparametric mass-univariate logistic model on imaging and clinical data of 405 stroke patients undergoing endovascular therapy. We included the dichotomized TICI-scale as a surrogate parameter for recanalization success. Variables not contributing to the improvement of the model were removed in a step-down approach. Model evaluation was performed on separate internal and external datasets and compared with the threshold-based methods.
Results: We found that perfusion parameter maps were sufficient for tissue outcome prediction. Clinical parameters as well as non-contrast CT and CT angiography did not improve predictive accuracy. Compared with single-parameter threshold-based models, our multiparametric logistic model had comparable volumetric accuracy (absolute volume difference: 36.8ml [±10.6] vs. 35.0ml [±9.4]), but showed a significant increase in spatial accuracy (DICE: 34.2% [±7.6] vs 27.3% [±7.7], AUC/ROC: 89.2% [±1.9] vs 80.8% [±3.2]).
Conclusions: Our results highlight the diagnostic value of perfusion data. Multiparametric mass-univariate logistic prediction has a high potential to outperform the classical single-parameter thresholding-based tissue outcome prediction in spatial accuracy and provides an optimized individual biomarker for the benefit from mechanical thrombectomy in acute stroke care.
Disclosure of interest: No

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Clinical outcome in ischemic stroke patients with type 2 diabetes treated with glucagon-like peptide-1 (GLP-1) receptor agonists versus dipeptidyl peptidase 4 (DPP-4) inhibitors

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Background and aims: Type 2 diabetes 2 (T2D) is a risk factor for ischemic stroke (IS) and is associated with an adverse prognosis.
Landmark cardiovascular outcome trials showed that GLP-1 receptor agonists and SGLT-2 inhibitors reduce the risk of major adverse cardiovascular events in patients with T2D, whereas DPP-4 inhibitors have not shown cardiovascular benefits.
Aim: To compare post-stroke outcomes amongst IS with T2D receiving GLP-1 or DPP-4.
Methods: A registry-based cohort study using all acute IS events from 2017-2020 in Denmark with co-morbid T2D receiving GLP-1 or DPP-4 at stroke admission.
Results were adjusted for age, sex, stroke severity, living arrangements, prior stroke, atrial fibrillation, smoking, hypertension, Charlson-Comorbidity-Index, immigrant-, income- and occupational status.
Results: The study included 592 persons with IS and T2D receiving GLP-1 and 973 receiving DPP-4.
Table 1 shows mortality and risk of severe- and re-stroke between the groups.
Conclusions: The 30- and 365-day post-stroke mortality rates were lower in IS with co-morbid T2D receiving GLP-1 before stroke compared to those receiving DPP-4. Further, the risk of severe stroke was lower amongst the persons receiving GLP-1 at the time of IS. We found no differences in the risk of re-stroke.

Table 1. GLP-1 vs. DPP-4 in IS with T2D.

30-day mortality (RR)	
Adjusted	0.37 (0.23 - 0.59)
	0.55 (0.34 - 0.90)
365-day mortality (RR)	
Adjusted	0.46 (0.35 - 0.60)
	0.73 (0.55 - 0.96)
Severe stroke (RR)	
Adjusted	0.39 (0.21 - 0.70)
	0.53 (0.28 - 0.99)
Re-stroke (HRR)	
Adjusted	0.78 (0.49 - 1.23)
	0.78 (0.49 - 1.26)

Disclosure of interest: Yes

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Predictors of Unfavorable Functional Outcome in Young and Middle- Aged Patients with First – Ever Ischemic Stroke

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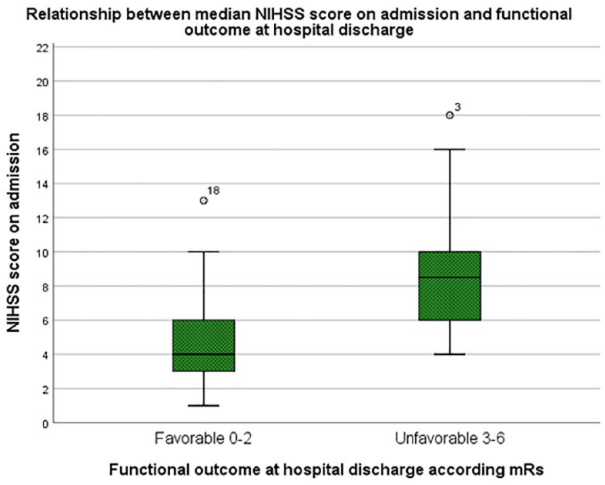
Background and aims: About 80% of young adult ischemic stroke (IS) patients have favorable functional outcome at hospital discharge, but data about predictors of unfavorable outcome is still insufficient. The aim of our study was to identify predictors of unfavorable outcome in young and middle-aged IS patients.
Methods: A prospective study of 81 patients with acute IS, admitted to the Neurology Clinic, University Hospital Pleven from 2022 to 2023 was done. IS severity was assessed by National Institutes of Health stroke scale (NIHSS). Functional outcome at discharge evaluated by the modified Rankin scale (mRS) was defined as favorable (0–2) or unfavorable (3–6). IS was classified according to the Oxford Community Stroke Project (OCSP) criteria as: total anterior circulation infarction (TACI), partial anterior circulation infarction (PACI), posterior circulation infarction (POCI) and lacunar infarction (LACI). The statistical analysis was performed with Statistical Package for Social Sciences version 26.0.
Results: The mean age of the patients was 47,82±7,83 years. Functional outcome at hospital discharge was favorable in 43 (53,1%) and unfavorable in 38 (46,9%) of patients. Ninety percent of the patients with TACI and 61,6% with PACI had unfavorable functional outcome (mRs 3-6). The median NIHSS score on admission in the group with unfavorable outcome was 8,5 and 4 in the group with favorable outcome. The differences were statistically significant ($p<0,0001$).
Conclusions: TACI, PACI and higher median NIHSS score on admission are significant predictors of unfavorable outcome at hospital discharge in young and middle-aged patients with first – ever IS.



Disclosure of interest: No

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Influence of First-pass Effect on Recanalization Outcomes in the Era of Mechanical Thrombectomy

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Background and aims: This study summarized the current literature to compare the safety and efficacy between first-pass effect (FPE) and multiple-pass effect (MPE) for thrombectomy in treatment of acute ischemic stroke (AIS)
Methods: Major databases were searched for studies which reported clinical outcomes regarding successful recanalization after first pass of mechanical thrombectomy in AIS. The assessment of bias was performed using different scales. I^2 statistic was used to evaluate heterogeneity between reviewers. Subgroup, meta-regression and sensitivity analyses were conducted to explore the source of heterogeneity.
Results: A total of 9 studies were eligible for final analysis. For successful recanalization (mTICI 2b-3), favorable outcomes were seen in 49.7% (95% confidence interval (CI): 40.5-58.9%) and 34.7% (95% CI: 26.8-42.7%) of FPE and MPE patients, respectively. Mortality at 3 months was 13.8% (95% CI: 10.8-16.9%) and 26.0% (95% CI: 17.7-34.2%), respectively. For AIS with successful recanalization, FPE had more favorable outcome (odds ratio (OR): 1.85, 95% CI: 1.48-2.30; $p < 0.01$; $I^2 = 0\%$) and lower mortality than MPE (OR: 0.58, 95% CI: 0.42-0.79; $p = 0.001$; $I^2 = 61.9\%$).
Conclusions: FPE is associated with better outcomes than MPE after achieving successful or complete recanalization.
Disclosure of interest: No

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In-hospital acute ischemic stroke case fatality

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Background and aims: In-hospital ischemic stroke case fatality ranges from 3 to 18%. A wide range of sociodemographic, clinical, imaging, laboratory and health resources variables are associated with this outcome. Knowledge of in-hospital ischemic stroke case fatality predictors allow clinicians to implement appropriate preventive measures, carried out needed studies and direct resources in an efficient manner. I describe the experience of in-hospital acute ischemic stroke case fatality and its risk factors.
Methods: A one-year single center, retrospective, cross-sectional studied was carried out. All admitted patients with acute ischemic stroke brain infarct type were included. Sociodemographic, clinical, laboratory and imaging studies variables were drawn out. Quantitative variables were summarized as means, medians and interquartile ranges. Bivariate analysis was used to evaluate associations of in-hospital stroke case fatality and imputed variables.
Results: 402 stroke brain infarct type patients were included, mean age 73,28 years (SD±14,53), 50,4% men. Prevalent vascular risks factors were hypertension (70,90%), diabetes mellitus type 2 (24,13%) and previous stroke (20,90%). There were 13 (3,2%) in-hospital case fatalities. Mean time from admission to death was 11.38 days (SD±10,8). Lower hemoglobin levels (p=0.002), lower total, LDL and HDL serum cholesterol levels (p=0.02), internal carotid artery stenosis >50% by duplex ultrasound (p=0.01) and stroke severity as measured by NIHSS score (p<0,0001) showed association with in-hospital stroke case fatality.
Conclusions: In our center, in-hospital ischemic stroke case fatality was low and high NIHSS score, high grade carotid stenosis, lower hemoglobin level, and low cholesterol (total, LDL, HDL) levels were associated with this outcome.
Disclosure of interest: No

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Mechanical thrombectomy in nonagenarians

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Background and aims: This study aimed to summarize the current literature on mechanical thrombectomy (MT) in nonagenarians and to provide updated clinical evidence of its feasibility, effectiveness, and safety in nonagenarians.
Methods: PubMed, EMBASE, the Cochrane Library, and Web of Science were searched for relevant randomized controlled trials and observational studies that reported the clinical outcomes of nonagenarians with acute ischemic stroke after undergoing mechanical thrombectomy. Risk of bias was assessed using different scales. I^2 statistic was used to evaluate the heterogeneity of the results.
Results: Thirteen studies and 657 patients were included. The estimated rate of successful revascularization was 80.82% (95% confidence interval [CI]: 77.48% - 83.97%), and the rate of favorable outcome (modified Rankin score [mRS] 0 - 2) was 21.60% (95% CI: 13.81% - 30.41%). The rate of good outcome (mRS score 0 - 3) was 23.08% (95% CI: 18.88% - 27.55%). The estimated risk of death during hospitalization was 20.55% (95% CI: 15.93% - 25.55%), while the mortality rate at 3 months was 44.38% (95% CI: 33.66% - 55.36%). The rate of intracranial hemorrhage (ICH) occurrence was 12.84% (95% CI: 5.27% - 22.68%), while the rate of symptomatic intracranial hemorrhage (sICH) was 3.52% (95% CI: 1.67% - 5.85%).
Conclusions: MT in nonagenarians demonstrated a high rate of successful revascularization. Conversely, the rate of futile revascularization is high with a low functional independence proportion. Therefore, MT should not be indiscriminately advocated in nonagenarians. Satisfactory results require careful selection of patients.
Disclosure of interest: No

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COMPARATIVE GAIT ANALYSIS BETWEEN TIA AND MINOR STROKE PATIENTS

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Background and aims: Transient ischemic attack is currently defined as transient symptoms without ischemic lesion in brain imaging. If an ischemic lesion is identified by MRI, the patient is considered suffering a minor stroke (MS). Gait and balance disorders are among the most important determinants of independent living in the elderly and TIA and minor stroke were associated previously with gait and balance disorders. Therefore, our aim is to analyze the gait profile in TIA and MS patients.
Methods: An observational study has been conducted among patients with transient neurological symptoms. They have been classified as TIA or MS according to the results of MRI (positive or negative DWI). Demographic and clinical data (including Berg Balance scale, BBS) were collected. All patients underwent a gait study using the Gaitrite Electronic System™. A comparative study was performed between the two groups.
Results: A total of 77 patients completed the study, 45 TIA and 32 MS. The mean age was 72.1 years, with no differences between groups. No differences were detected in the main gait parameters (FAP, speed, distance, step length) between the two groups. Neither in the BBS. There was no significant relationship between gait parameters and symptom duration. We found a weak negative correlation between time to antiagregation loading dose and BBS.
Conclusions: Although previous studies demonstrate alterations in gait in patients with TIA and MS, our study does not show differences in the gait profile between TIA and MS depending on whether DWI-MRI lesions are present or not.
Disclosure of interest: No

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Prognostic Significance of Serum Globulin in Patients with Acute Ischemic Stroke

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Background and aims: We investigated the association between serum globulin levels upon hospital admission and in-hospital short-term outcomes in acute ischemic stroke (AIS) patients.
Methods: A total of 3,127 AIS patients enrolled from December 2013 to May 2014 across 22 hospitals in Suzhou city were included in the present study. We divided patients into 4 groups according to their level of admission serum globulin: Q1 (<23.5 g/L), Q2 (23.5–26.4 g/L), Q3 (26.4–29.9 g/L), and Q4 (≥29.9 g/L). Logistic regression models were used to estimate the effect of serum globulin on the short-term outcomes, including in-hospital pneumonia, all cause in-hospital mortality and poor outcome upon discharge (modified Rankin Scale score ≥3) in AIS patients.
Results: The risk of in-hospital mortality was significantly higher in patients with highest serum globulin level (Q4) compared to those with lowest (Q1) (adjusted odds ratio [OR] 1.95; 95% confidence interval [CI], 1.03-3.68; P-trend =0.027). The highest serum globulin level (Q4) was associated with a 1.44-fold and 1.61-fold increase in the risk of poor outcome upon discharge (adjusted OR 1.44; 95% CI, 1.10-1.88; P-trend =0.008) and in-hospital pneumonia (adjusted OR 1.61; 95% CI, 1.18-2.20; P-trend =0.001) in comparison to Q1 after adjustment for potential covariates.
Conclusions: A high level of serum globulin upon hospital admission was independently associated with all cause in-hospital mortality, poor outcome upon discharge and in-hospital pneumonia in AIS patients.
Disclosure of interest: No

1448

CONTRALESIONAL CORTICAL MICROSTRUCTURE IS LINKED WITH OUTCOME AFTER ACUTE ISCHEMIC STROKE

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Background and aims: Diffusion imaging offers new techniques to investigate cortical microstructure in-vivo which extend available tools to assess structural reserve in stroke recovery research. Literature has indicated that lower cortical fractional anisotropy (FA) might associate with higher cytoarchitectonic complexity as a potential surrogate of microstructural reserve. We hypothesized that lower FA of contralesional cortices of the frontal lobes, which contain key areas of the human motor network, might be linked with favorable outcome after stroke.
Methods: Clinical and diffusion-based imaging data from 19 patients were obtained acutely after stroke and after 3-6 months. We calculated free water corrected mean FA for the contralesional frontal lobe. Ordinal logistic regression was used to relate cortical FA, dichotomized into higher and lower FA by median split, to the modified Rankin Scale (mRS) at follow-up, adjusted for age, initial severity and hemispheric dominance.
Results: Patients with lower FA exhibited lower levels of residual disability at follow-up (P=0.004, Fig. 1). Higher baseline NIH Stroke Scales values (P=0.006) and age (P=0.03) were independent predictors of worse outcome.
Conclusions: These findings indicate that the diffusion-based assessment of cortical microstructure might serve as a powerful, novel tool for recovery research and significantly add to the emerging concepts of brain health and structural reserve of contralesional cortices for outcome variability after stroke.

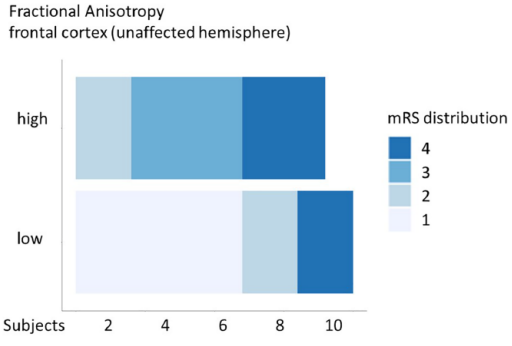

Fig. 1. Residual mRS at 3-6 months after stroke across groups of patients with high or low fractional anisotropy in the unaffected frontal cortex at stroke onset.

Disclosure of interest: No

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NEURON SPECIFIC ENOLASE IN ACUTE STROKE

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Background and aims: Neuron-Specific-Enolase (NSE) is a glycolytic enzyme, released after stroke, cardiac arrest, trauma. Its level may identify patients at risk of poor outcomes. The aim of our study was to assess NSE in acute stroke (AS).
Methods: We recruited 210 patients, subgrouped according to age (A:up to 29years; B:30-44years; C:45-64years; D:65-76years; E:$>$ 77years) and type of infarction (1: Lacunar-Small Vessel Occlusions (L-SVO); 2: Large-Medium Vessel Occlusions (L-MVO).
Results: NSE was not significantly higher in group D and E compared with A and B. Mild significance was detected in A1 vs B1 and C1 and between C2 vs D2, especially in patients with concomitant chronic ischaemic encephalopathy (CIE) compared to those without CIE and in L-MVO. Pearson's test showed correlations of NSE with age, day1 GCS, day7 GCS, day7 MRS, PAP, LAD, BNP.
Conclusions: NSE level may increase by aging. This occurs in AS. However, its entity may decrease in CIE, when gliosis becomes predominant. Levels correlate with worst acute neurological-cardiological conditions, especially in elderly patients, as expression of acute severe ischaemic sufferance and reduced clearance. Higher standard deviations and lower correlations may lessen statistical significance in the most advanced age. Nonetheless, NSE may be a useful parameter of necrosis and blood-brain-barrier disruption, although the half-life is brief. Biomarkers with longer half-life, as tau and neurofilament light proteins, may better indicate the burden of axonal degeneration in CIE. Further biological and radiological data would allow better prediction of prognosis and appropriate protocol of rehabilitation, based on benefit-cost analysis.
Disclosure of interest: No

1506

Automatic assessment of 3month MRS using Diffusion-Weighted Imaging in Acute Ischemic Stroke with Emergency clinical information

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Background and aims: The accurate estimation of acute ischemic stroke (AIS) using diffusion-weighted imaging (DWI) is crucial for assessing patients and guiding treatment options. This study aimed to propose a method that estimates stroke outcome in DWI and Emergency clinical information.
Methods: Consecutive patients who underwent DWI for AIS were retrospectively recruited from two hospitals. The AIS cases in each hospital were as follows: from January 2011 to December 2019 for HUCSHH, and from July 2014 to October 2019 for KNUH. Eventually, 2159 DWI images of AIS (for HUCSHH, 694 men and 485 women with a mean $\pm$ standard deviation age of 69.8 $\pm$ 12.7, and for KNUH, 555 men and 425 women with a mean $\pm$ standard deviation age of 72.4 $\pm$ 12.4) were included. We constructed algorithms using pretrained Medicalnet with other outcome parameters
Results: The model achieved an accuracy of 73.3%, an AUC of 0.764, and an F1-score of 0.751. The most important factors that were found to determine the outcome of the stroke were the initial National Institutes of Health Stroke Scale (NIHSS) score, patient age, initial diffusion MRI volume, and lesion location. These factors likely play an important role in determining the severity of the stroke and the likelihood of a favorable outcome.
Conclusions: Deep learning approaches using DWI and initial clinical data may be useful for estimating stroke outcome and may serve as an ancillary tool that can assist physicians in making urgent clinical decisions.
Disclosure of interest: No

1516

STROKE PATIENTS HAVE LOWER BLOOD LEVELS OF NUTRIENTS THAT ARE RELEVANT FOR RECOVERY: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and aims: Malnutrition is common after stroke and may not be limited to suboptimal bodyweight and energy intake but also includes inadequate blood levels of nutrients. This systematic review and meta-analysis aimed to investigate blood levels of a broad selection of nutrients in stroke cases compared to controls.
Methods: MEDLINE, CAB and Embase abstracts were searched for studies published in English from 1980 until 2022. Studies with adult stroke subjects and controls whose blood samples were analyzed for compounds from a selected series of nutrients known to exert anti-oxidant or anti-inflammatory activity or be involved in membrane phospholipid synthesis. Results were generated with a random-effects meta-analysis-model for unadjusted and age-adjusted data, if the number of reports per nutrient was $>$3.
Results: From 57 studies, there were 105 reports on blood levels of specific nutrients. Results showed significant changes in blood levels of many nutrients in stroke patients compared to controls. For 64% of nutrients lower levels were observed; for 29% there were no significant differences, while for 7% of nutrients increased levels were observed. In general, observed reductions in nutrient levels were independent of the phase (acute-subacute-chronic) after stroke.
Conclusions: Our results show lower blood levels in stroke patients as compared to controls for many nutrients that are involved in recovery and repair processes after stroke. These results underline the presence of a suboptimal nutritional status after stroke. The inclusion of specialized nutritional interventions to support recovery after stroke should receive consideration, in the multidisciplinary context of stroke rehabilitation.
Disclosure of interest: Yes

1550

Risk factors for recurrent cerebrovascular events in patients with transitory ischemic attack-a cohort study

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Background and aims: Transitory ischemic attack (TIA) is a known risk factor for subsequent ischemic stroke. Risk stratification beyond de $ABCD^2$ score could help identify high-risk patients.
Methods: We retrospectively included patients with the diagnosis of transitory ischemic attack admitted to the Neurology Department in a tertiary Stroke Centre from December 2012 to January 2022. Our aim was to assess clinical and laboratory findings associated with recurrent ischemic events defined as stroke or TIA at 6 months follow-up.
Results: Out of 150 patients for which follow-up data were available, 13 patients (8.6%) had a recurrent ischemic cerebral event at 6 months- 6 had TIA (3,5%) and 7 had a stroke (4,1%). The median $ABCD^2$ score in the studied population was 4. There was no significant difference in the $ABCD^2$ score between the two groups (p=0.361). The 6-month recurrent rate was 7.6%. Patients with ischemic recurrence had significantly higher erythrocyte sedimentation rate (ESR) at admission (50/min, IQR 32-53 vs. 17/min, IQR 7-26), p=0.035) and blood glucose levels (117, IQR 100-147 vs 137, IQR 123-156, p=0.037). Peripheral artery disease (PAD) was more common in patients with repeated events (8.8% vs 30.8%, p=0.035) and was an independent risk factor for stroke recurrence (RR=1.24, 95% CI, 0.934-1,656).
Conclusions: Peripheral artery disease is an independent risk factor for stroke recurrence in patients with TIA. Ongoing inflammation might present a supplementary risk factor in this patient population.
Disclosure of interest: No

1566

Functional, cognitive and subjective well-being outcomes 7-9 years after minor lacunar or cortical ischaemic stroke: The Mild Stroke Study 2 (MSS-2)

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Background and aims: Data on the long-term impacts of mild ischaemic stroke and small vessel disease are lacking or originate from studies with a short follow-up period. We report data on functional, cognitive and subjective well-being outcomes 7-9 years post lacunar or mild cortical ischaemic stroke.
Methods: We recruited patients within 3 months of non-disabling stroke (mRs $\leqslant$2) and assessed demographics, vascular risk factors, dependency (mRS), cognition and brain MRI. At 7-9 years post-stroke, we assessed dependency, subjective cognition, mobility, depression/anxiety and well-being using validated questionnaires and tools including the Stroke Impact Scale (SIS).
Results: We recruited 264 participants (mean age at recruitment 66.91, [SD=11.84], 41.7% female,44.7% lacunar). At 7-9 years post-stroke, we checked for vital status and sent questionnaires to participants known to be alive and who had agreed to continued participation at 3 years (111 excluded: 61 deceased,27 uncontactable,15 declined,8 lacked capacity to consent). We received 96 (62.7%) out of 153 questionnaires sent (mean age 72.26, [SD=10.76], 39.6% female, 46.9% lacunar) at mean= 8.48 years, [SD=0.57] after stroke. Half of participants (48.9% lacunar, 54.9% cortical) had memory concerns and 40.6% experienced lingering problems post-stroke (37.8% lacunar, 43.1% cortical), including slowed thinking (52.2% lacunar, 38.3% cortical) and mobility problems (44.4% lacunar, 44% cortical). In total, 41.7% suffered from anxiety/depression and 33% felt stroke limited their social life. Dependency was low (median mRS 1,IQR 0-2,11.8%, mRS$>$2); 45.7% reported difficulties performing usual activities including household tasks (35.1%) and self-care activities like washing or dressing (19.4%).
Conclusions: Recognising the substantial long-term impact of mild stroke is essential for directing clinical management and research priorities.

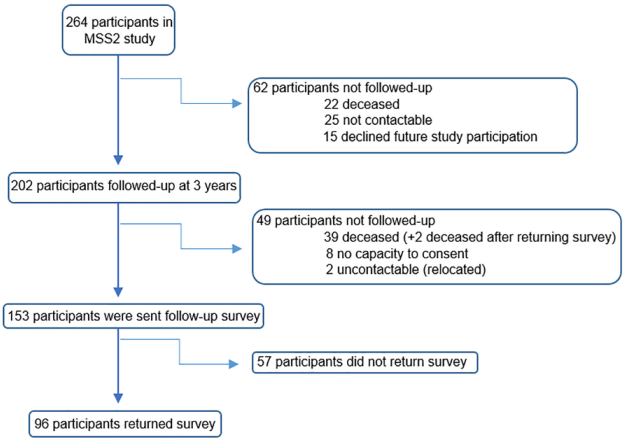

Figure 1. Data collection flow diagram.

Disclosure of interest: No

1665

NEIGHBORHOOD DENSITY OF RELIGIOUS ORGANIZATIONS IS ASSOCIATED WITH DISABILITY AND DEPRESSION AMONG STROKE SURVIVORS IN SOUTH TEXAS, UNITED STATES

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Background and aims: Religious organizations provide support and opportunities for socializing. We assessed if neighborhood density of religious organizations is favorably associated with post-stroke outcomes.
Methods: Incident stroke survivors (2009-2020) were ascertained from a population-based stroke cohort in Texas, US. Our exposure was density of religious organizations by census-tract (dichotomized by the median (4.5)). Outcomes were assessed at 90-days (Table 1). We fit adjusted linear mixed models with inverse probability weighting and multiple imputation and considered an interaction with stroke severity.
Results: The sample was 45-95 years old, primarily male (53.4%) and Mexican American (62.6%). Stroke severity modified associations of religious organization density with disability and depression (p=0.0040,

p=0.1199, respectively). Greater density was associated with greater disability among mild and greater depression among mild and especially moderate-severe stroke survivors (Figure 1). Greater density was possibly associated with less disability among moderate-severe and worse quality of life among all stroke survivors.

Conclusions: Unexpectedly, residing in neighborhoods with greater density of religious organizations was associated with worse outcomes. One possible hypothesis is stroke survivors who frequented religious organizations pre-stroke are not able to do so post-stroke. Further research is needed to unravel these associations with consideration of confounding by socioeconomic status and potential effect modification by ethnicity and age.

Table 1. Outcomes.

Outcome (N)	Scale	Range	Higher means
Disability (1,392)	Activities of Daily Living (ADL)/ instrumental ADL	1-4	Worse
Depression (1,188)	Patient Health Questionnaire-8	0-24	
Quality of Life (1,293)	Abbreviated Stroke-Specific Quality of Life	0-5	Better
Cognition (1,299)	Modified Mini-mental State Exam	0-100	

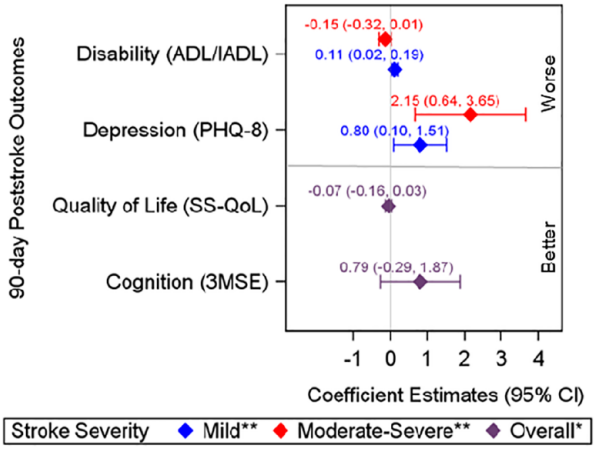

Figure 1. Association of religious organization density in the neighborhood and 90-day post-stroke outcomes

*Adjusted for demographics (age, sex, race/ethnicity), individual socioeconomic status (education, health insurance), pre-stroke health (comorbidities, function, cognition, depression, smoking), interpersonal factors (marital status, social support), neighborhood socioeconomic status (neighborhood disadvantage, neighborhood affluence), and stroke severity.

**Additionally adjusted for interaction between religious organization density and stroke severity.

Disclosure of interest: No

1722

Association of admission hyperglycaemia and diabetes mellitus with outcome after bridging therapy vs. mechanical thrombectomy in acute ischaemic stroke in anterior circulation

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Background and aims: The aim of this study was to investigate the association of diabetes mellitus (DM) and admission hyperglycaemia (AH) and outcome in patients with acute ischaemic stroke with large vessel occlusion in the anterior circulation treated with bridging therapy (BT) versus mechanical thrombectomy (MT) in daily clinical practice, as alteplase is currently in short supply.

Methods: Patients admitted to our Bernese Stroke Centre between 02/2015 and 06/2021 were consecutively included in this observational cohort study. Patients treated with BT versus MT and with versus without DM and with versus without AH (glucose ⩾7.8 mmol/L) were compared.

Results: 1250 patients (48.5% women, median age 76 years), 290 (23.2%) with DM and 356 (28.5%) with AH were analyzed.

Patients with AH treated with BT versus MT were more frequently dead at 3 months (41.9% versus 32%,OR=1.72 (95%CI:1.09-2.72), adjusted-p=0.019) but less frequently showed recurrent/progressive in-hospital ischaemic stroke NIHSS⩾4 (6.9% versus 13.9%, OR=0.38 (95%CI:0.17-0.84), adjusted-p=0.016).

Patients without AH/DM treated with BT versus MT less frequently suffered from in-hospital symptomatic intracerebral haemorrhage (3.4% versus 7.2%, OR=0.42 (95%CI:0.21-0.81), adjusted-p=0.009/4.4% versus 7.8%, OR=0.51 (95%CI:0.29-0.91), adjusted-p=0.021) and vascular death (49.5% versus 62.9%, adjusted-p=0.012 and 50.9% versus 63.2%, adjusted-p=0.010).

All other outcomes did not differ in group comparisons.

Conclusions: Whether patients with DM got treated with BT versus MT did not reveal different outcomes. However, in the other group comparisons, there were few differences in outcomes, most of which in favour of BT except death at 3 months in patients with AH. Further studies are needed in this specific field of stroke.

Disclosure of interest: No

1775

Return to work after ischaemic stroke in young adults: a cohort study, systematic review and meta-analysis of proportions

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Background and aims: Ischaemic stroke (IS) incidence in young adults is increasing globally, leading to significant morbidity and economically

productive years lost. Returning to work (RTW) is thus a key rehabilitation goal, but literature on this is limited. We evaluated RTW incidence in a young IS cohort from Asia, thereafter performing a systematic review and meta-analysis to evaluate pooled incidence and associations of RTW in young IS.

Methods: We retrospectively evaluated all consecutive young adults (18-50 years) with IS admitted to a comprehensive stroke centre from 2020-2021. In parallel, we searched PubMed, Embase, Scopus and Cochrane databases for all similar cohorts from 2000-2022. We meta-analysed associations between established risk factors and RTW, plus overall pooled proportions for RTW and functional recovery (defined as 90-day modified Rankin Scale of 0-2).

Results: 226 young IS patients were included in our cohort study, with 58/117 (49.6%) RTW and 134/167 (80.2%) functional recovery. 6 cohort studies incorporating 1329 patients were included (Table 1). Meta-analysis illustrated that pooled proportions of young IS patients who RTW was 793/1329 (59.78%; CI 51.97-67.13, I2=83.3%; Figure 1A), whilst 535/651 (82.18%; 95% confidence interval [CI] 79.05-85.93, I2=0%; Figure 1B) achieved functional recovery. Non-smokers were significantly more likely to RTW (Odds ratio [OR] 0.65, CI 0.54-0.80, I2=0%; Figure 2). Other risk factors like hypertension, ischaemic heart disease, diabetes mellitus and prior stroke were not associated with RTW.

Conclusions: Despite high rates of functional recovery, many young IS patients do not RTW. This mismatch between functional recovery and RTW warrants further research.

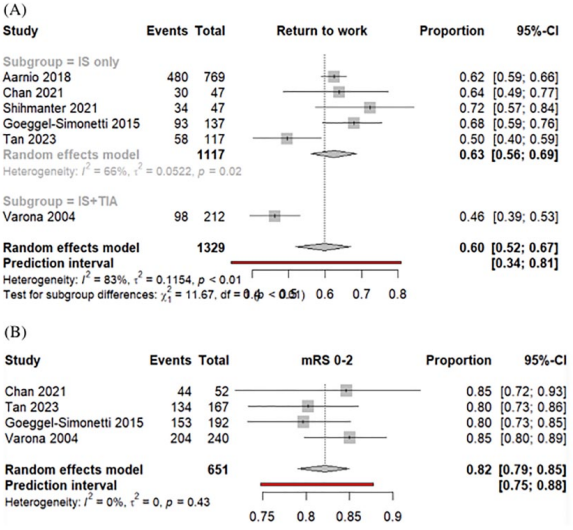
Disclosure of interest: No

Table 1. Characteristics of included studies.

Study	Aarnio 2018 (Finland)	Chan 2021 (Malaysia)	Goeggel-Simonetti 2015 (Switzerland)	Shihmanter 2021 (Israel)	Varona 2004 (Spain)	Tan 2023 (Singapore)
Design	Retrospective cohort	Prospective cohort	Prospective cohort	Prospective cohort	Retrospective cohort	Retrospective cohort
Study Period	Jan 1994-May 2007	Oct 2016-Jun 2018	Jan 2000-Dec 2008	Jan 2001-Dec 2010	Mar 1974-Mar 2001	Jan 2020-Dec 2021
Follow-up	4.5-18 years	11-21 months; mean 14.8 months	6.9 (IQR 4.7–9.4) years*	5.1 +- 2.5 years*	11.7 +- 7.9 years; 0.2-27 years	3 months
NOS (S, C, O)	9 (4, 2, 3)	8 (4, 2, 2)	6 (3, 0, 3)	7 (3, 2, 2)	7 (4, N/A, 3)	7 (4, N/A, 3)
Inclusion Criteria	15-49yo; in paid employment 1y before IS, discharge NIHSS <= 15, first stroke.	18-50yo; Malaysian national; first stroke.	16-45yo; first or recurrent stroke.	18-45yo; first or recurrent stroke.	15-45yo; first stroke or TIA.	18-50yo; first or recurrent stroke.
Age, years Mean +/- SD or Median (IQR)	44 (37-47)	-	35.5 +/- 7.9	38.1 +/- 6.8	36.6 +/- 7.2	43.5 +/- 5.5
No. of participants	852	86	199	60	272	226
Admission NIHSS Mean +/- SD or Median (IQR)	3 (1-6)	-	6 (1-38)	-	-	5.29 +/- 6.08
RTW (%)	480/769 (62.4)	30/47 (63.8)	93/137 (67.9)	34/47 (72.3)	98/212 (46.2)	58/117 (49.6)
3mo mRS 0-2	-	44/52 (84.6)**	-	-	204/240 (85)	134/167 (80.2)

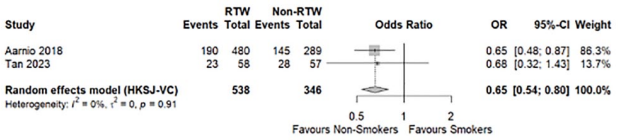
RTW, return to work; NOS (S, C, O), Newcastle-Ottawa Scale (Selection, Comparability, Outcomes); IQR, inter-quartile range; NIHSS, National Institutes of Health Stroke Scale.
*Includes a second arm of patients, which was not included in our review, though the authors report this to be similar in both arms.
**The Modified Barthel Index (MBI) was used in this study. We considered MBI 91-100 equivalent to mRS 0-2.

Figure 1. Proportion of young ischaemic stroke patients who: (A) returned to work after an ischaemic stroke, with subgroup analysis by return to full or reduced capacity; and (B) achieved functional recovery, defined as 90-day modified Rankin Scale (mRS) of 0-2.



IS, ischaemic stroke; TIA, transient ischaemic attack; mRS, modified Rankin Scale; 95%-CI, 95% confidence interval.

Figure 2. Meta-analysis of smoking as a predictor of returning to work following an ischaemic stroke.



OR, odds ratio; 95%-CI, 95% confidence interval; RTW, return to work; HKSJ-VC, Hartung-Knapp-Sidik-Jonkman method with variance correction.

1779

ENTERAL CILOSTAZOL AND NIMODIPINE COMBINATION IN PATIENTS WITH ANEURYSMAL SUBARACHNOID HEMORRHAGE: PRELIMINARY EXPERIENCE

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Background and aims: Cilostazol, a potent phosphodiesterase inhibitor, reduced cerebral ischemia and death or disability in patients with aneurysmal subarachnoid hemorrhage (aSAH).

Methods: We determined the rate of premature discontinuation, minor and major bleeding, and functional independence at discharge among patients who were treated with cilostazol (100mg twice daily) in combination with enteral nimodipine. We compared the rates of functional independence with historical controls using both matched comparison and multivariate analysis.

Results: A total of 17 aSAH patients were treated with oral cilostazol (initiated within 48 hours of onset) and continued for a mean period (standard deviation) of 17.4 (±7.2) days. Premature discontinuation of cilostazol occurred in 2 patients due to hypotension and 4 patients after unrelated death. Major and minor bleeding was seen in none of the patients. A total of 12 patients underwent intraventricular catheter placement (8 after cilostazol was started) and 4 patients underwent craniectomy (all after cilostazol was started) without post procedure complications. In matched control analysis, the proportion of patients with functional independence was higher among cilostazol treated patients compared with those who were not treated with cilostazol (8 of 17 [47.1%] and 15 of 78 [19.2%], respectively). In the multivariate analysis, cilostazol use was associated with higher odds of functional independence (odds ratio 4.18, 95% confidence interval 0.97,19.59) after adjusting for age, sex, Hunt and Hess grade, and Fisher grade.

Conclusions: Our study provides data regarding safety and tolerability of cilostazol and
nimodipine combination in aSAH patients with preliminary evidence of therapeutic benefit.

Disclosure of interest: No

1787

A RETROSPECTIVE ANALYSIS OF ADHERENCE IN CHINESE ISCHEMIC STROKE AND TRANSIENT ISCHEMIC ATTACK PATIENTS TREATED WITH PCSK9 MONOCLONAL ANTIBODY FOR 6 MONTHS

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Background and aims: There are more than 24 million patients with ischemic stroke (IS) and transient ischemic attack (TIA) in China, and about 70% haven't reached the LDL-C target value (70mg/dL). Recent studies revealed that the application of PCSK9 monoclonal antibody (PCSK9mAb) could reduce LDL-C, but not yet analyzed its adherence in Chinese IS and TIA.

Methods: There were 61 IS and TIA inpatients included from December 23, 2019, to June 24, 2022. We analyzed PCSK9mAb adherence in 3rd, 6th, 9th and 12th months. PCSK9mAb adherence was reported by the proportion of days covered (PDC), 0.8 or greater was considered to have fine adherence.

Results: The mean age of the study population was 56.85±12.88 years and 77.05% were men. Majority (98.36%) of patients adopted statin combined PCSK9mAb therapy. The proportion of moderate-intensity statin use was 40.98% and high-intensity statin use was 59.02%. At the 3rd, 6th, 9th and 12th months of follow-up, the mean PDC of PCSK9mAb was 0.4496±0.30, 0.2960±0.25, 0.2094±0.14 and 0.2043±0.16. Approximately 3.4% patients were considered to have fine adherence. We found that 82.75% of patients stop PCSK9mAb therapy within 3 months and 94.82% discontinued within half a year. Inadaptation to frequent injection (40.00%) was the most primary reason, especially in the first 3-month treatment (52.38%). Besides, extremely low level of LDL-C (23.64%) was also one of the main reasons for stopping use.

Conclusions: Chinese IS and TIA patients had poor PCSK9mAb adherence and needed to be improved in the future.

Table 1: Characteristics of patients who initiated PCSK9mAb therapy between 2019 and 2022.

	No. (%)
Sex(male)	47 (77.05)
Age	56.85±12.88
Occupation	
Retire	6(9.84)
Farmer	25(40.98)
Serviceman	1(1.16)
Self-employed	3(4.92)
Worker	12(19.67)
Unemployed	2(3.28)
Other	12(19.67)
Health insurance type	
Urban residents	15 (24.59)
Urban employees	14(22.95)
New rural cooperative medical system	15(24.59)
Oneself own expense	7(11.48)
Others	10(16.39)
Current smoking	19 (31.15)
Current drinking	15 (24.59)
Medical history	
Ischemic stroke and TIA	19(31.15)
Coronary Heart Disease	7(11.48)
Atrial Fibrillation	2(3.28)
Hypertension	36(59.02)
Hypercholesterolemia	14(22.95)
Diabetes	21(34.43)

Table 2: The reasons for stopping PCSK9mAb therapy.

	Total	3rd month follow-up	6th month follow-up	6th month follow-up	12th month follow-up
No.	61	23	16	11	8
Inadaptation to frequent injection	40.00%	52.38%	37.50%	20.00%	37.50%
Expensive cost	23.64%	23.81%	31.25%	10.00%	25.00%
Extremely low LDL-C	23.64%	14.29%	25.00%	40.00%	25.00%
Difficulty in purchasing drugs	12.73%	9.52%	6.25%	30.00%	12.50%

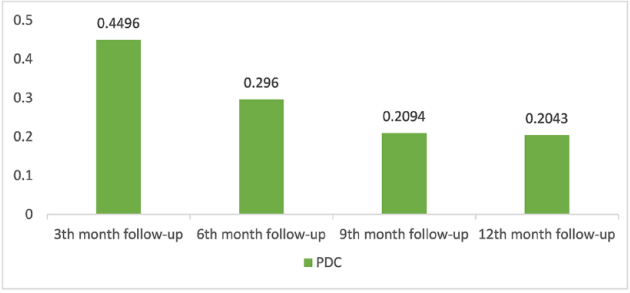

Chart1: Mean PDC value of PCSK9 mAb at different follow-up time

Disclosure of interest: No

1885

Impact of leukoaraiosis in the degree of collateral circulation in stroke patients with large vessel occlusion

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Background and aims: Leukoaraiosis and collateral circulation (cc) are processes that involve small vessels. Our main aim was to investigate the impact of leukoaraiosis in the degree of cc and its influence on functional outcome at 3 months in ischemic stroke due to large vessel occlusion.

Methods: We performed a prospective and observational study between 1st June 2021- 31st January 2022 of consecutive patients with ischemic stroke due to large vessel occlusion (TICA, M1, M2), subjected to endovascular treatment. Leukoaraiosis was measured in Magnetic Resonance Image with total Fazekas score (periventricular and deep white matter, ranging from 0-3). As prognostic variables we determined the degree of cc with cerebral perfusion on Computed Tomography using the Hipoperfusion Intensity ratio (HIR)-Tmax>10 seconds/Tmax>6 seconds (good cc-HIR<0.4/poor cc-HIR≥0.4, functional prognosis was assessed by using the modified Rankin Scale score (mRS).

Results: We included 60 patients. Mean age was 73.5±12.5 years. Median NIHSS on admission 18 (11-22). Moderate to severe leukoaraiosis was associated with poor cc [OR 0.244 (0.009-0.204), p=0.033]. In logistic regression model total Fazekas score of 2-3 [OR 8.01 (1.98-32.46),

p=0,004] and ASPECTS [OR 2.03 (1.36-3.56), p=0.001] were independently associated with poor cc. An interaction analysis between degree of leukoaraiosis and cc emerged as predictor of functional outcome at 3 months [OR 10.81 (1.07-108.76), p=0.043].
Conclusions: Severity of leukoaraiosis was associated with poor collateral grade in patients with ischemic stroke with anterior circulation large vessel occlusion. There was a synergistic effect between leukoaraiosis and cc as determinants of poor functional outcome.
Disclosure of interest: No

2097

The Impact of Diabetes Mellitus and Admission Hyperglycemia on Clinical Outcomes after Recanalization Therapies for Acute Ischemic Stroke: STAY ALIVE National Prospective Registry

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Background and aims: It was previously reported that diabetes mellitus and admission hyperglycemia were associated with poor clinical outcomes in patients with acute ischemic stroke who were treated with intravenous thrombolysis or mechanical thrombectomy. Our study aimed to assess the prognostic effect of diabetes and aHG on clinical outcomes in patients treated with recanalization therapies.
Methods: Our multicentric study was based on data from the prospective STAY ALIVE stroke registry between November 2017 and January 2020. We compared the demographic data, clinical parameters and time metrics between recanalized DM and non-DM groups, and we analyzed the impact of DM and aHG on 90-day functional outcome, 90-day mortality, symptomatic intracranial hemorrhage, and successful recanalization. Altogether, we included 695 patients from the three participating stroke centers in Hungary. Regarding the overall population, patients with diabetes were older and comorbidities were more frequent.
Results: There were significant differences in the 90-day good functional outcome, 90-day mortality and the rate of symptomatic intracranial hemorrhaging between the groups. Diabetes and aHG were independently associated with a poor clinical outcome and mortality at 3 months and sICH in the overall population. However, the presence of DM and aHG was not correlated with successful reperfusion after MT.
Conclusions: Our study revealed that diabetes and hyperglycemia on admission were correlated with poor clinical outcomes at 3 months in patients with acute stroke regardless of the recanalization method. In addition, the variables were also associated with sICH after recanalization therapies.
Disclosure of interest: No

2136

NEUROVASCULAR COUPLING AND FUNCTIONAL OUTCOME WITHIN 90 DAYS-AFTER ISCHEMIC STROKE

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Background and aims: The higher metabolic demand during neuronal activity induces an increase in cerebral blood flow. Deterioration of this fundamental healthy brain function was found to be crucial in the development of dementia in animal models. We aimed to determine if neurovascular coupling (NVC) at acute stage of stroke is predictive of functional recovery at 90 days.
Methods: We prospectively include all ischemic stroke with occlusion in anterior circulation, with Modified Rankin Score (mRS)$\leqslant$4 and without previous cognitive decline (The Informant Questionnaire on cognitive decline in the elderly score$<$3.5). Cerebral blood flow (CBFV) was assessed by transcranial Doppler at both P2 segment of the posterior cerebral artery secured by a probe-holder. NVC was determined by the peak relative increase in CBFV during a visual stimulus paradigm of each of 5 cycles of increasing length (5-sec, 10-sec and 20-sec ON-OFF phases) of a flickering checkerboard. Functional outcome was determined by mRS at 90 days.
Results: We analyzed 141 patients, 65% males, aged 67 (SD 11). Worse functional outcome was observed in 31 patients (22%). The magnitude of CBFV during stimulus paradigm from short (5-sec) to medium (10-sec) and long (20-sec) lengths did not differ significantly between groups of good and bad functional outcome ($p>0.05$).
Conclusions: The dynamics of NVC from visual stimulation, measured by TCD, in anterior circulation stroke was not predictive of functional impairment within 90 days-after stroke. The ongoing prospective study will aim to show if the NVC can be predictor for future subtle cognitive impairment.
Disclosure of interest: No

2168

CLINICAL AND NEUROANATOMICAL CORRELATES OF POST-STROKE FATIGUE

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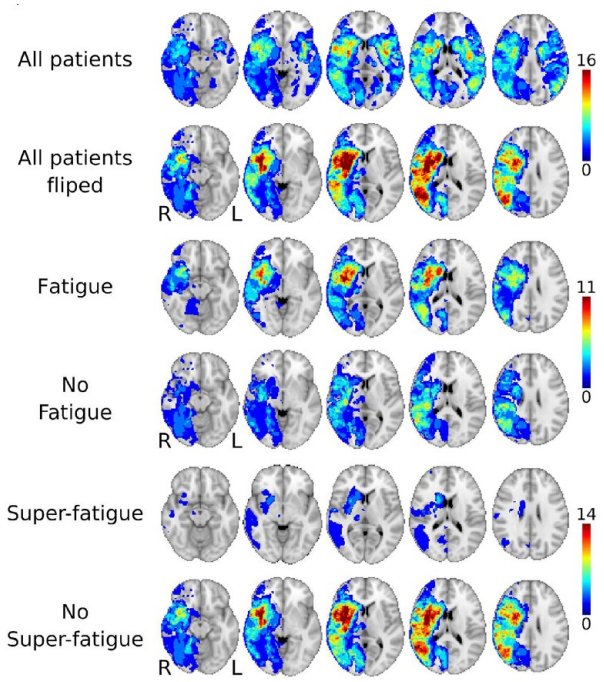
Background and aims: Post-stroke fatigue (PSF) has been described as early exhaustion with tiredness that develops during physical or mental activity and that generally does not improve with rest. Stroke survivors describe PSF as qualitatively different from pre-stroke fatigue. There are inconsistent findings on the relationship between the characteristics of the ischemic brain lesion and PSF.
Aim: To evaluate the severity of PSF in relation to the location and the size of the ischemic lesion in acute stroke patients to establish possible predictors of PSF.
Methods: We performed a prospective observational study to establish potential early predictors of long-term PSF, which was assessed using the Fatigue Assessment Scale 6 months after stroke. After segmenting brain infarcts on DWI images, we studied the association with PSF using voxel-based lesion-symptom mapping.
Results: Out of 104 patients, 61 (59%) reported PSF. Female sex and history of diabetes mellitus was associated to greater risk of developing PSF. The volume of the ischemic lesion was not associated with PSF, and

voxel-based lesion symptom mapping Analysis did not identify any specific brain area significantly associated with PSF.
Conclusions: PSF is very frequent in stroke patients, even after 6 months. The absence of neuroanatomical correlates of PSF suggests that it is a multifactorial process with biological, psychological, and social risk factors that require further study.



Disclosure of interest: No

2346

PREDICT-JUVENILE-STROKE: PROSPECTIVE EVALUATION OF A PREDICTION SCORE DETERMINING INDIVIDUAL CLINICAL OUTCOME THREE MONTHS AFTER ISCHEMIC STROKE IN YOUNG ADULTS

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Background and aims: Juvenile stroke (18-55 years) is a highly relevant issue for both socioeconomic and individual aspects and there is a need for valid tools to predict outcome and treatment responses. We developed a clinical score to predict functional outcome after three months in juvenile stroke patients and aim for prospective validation in a multicenter cohort study (DRKS00024407).
Methods: We analyzed retrospective data of 340 juvenile stroke patients, admitted to our local stroke unit between January 2011 and March 2020, for development of the prediction model. The score comprises preadmission factors, clinical and paraclinical findings, results of diagnostics during hospital stay and prophylactic treatment at discharge and is of high predictive value (AUC 96.4%). For validation, a new data entry system ("PMD Stroke") based on existing IT infrastructure was developed, which allows the documentation of clinical routine data in a structured manner to be also usable for further research. After monocentric integration into clinical routine in December 2022, the "PMD Stroke" is currently subject to internal testing and will be rolled out to three German stroke centers to be implemented locally for subsequent prospective data collection.
Results: We expect to present preliminary multi-center data of prospective score validation. Furthermore, clinical application, structure and standardized data processing of the "PMD Stroke" will be demonstrated.
Conclusions: The proposed prediction score is potentially capable of valid individual outcome prediction in juvenile stroke patients. Furthermore, comprehensive and standardized documentation of routine clinical data can increase its discriminatory power and may drive new hypotheses.
Disclosure of interest: No

2372

RECURRENCE OF ISCHAEMIC STROKE IN PATIENTS WITH INCOMPLETE ETIOLOGICAL APPROACH

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Background and aims: In most studies, patients with incomplete etiological approach are excluded, however, in Latin countries this is the most frequent proportion of patients with ischaemic stroke (IS). The aim of our study was to assess the risk of IS recurrence in patients with incomplete studies.
Methods: Retrospective and longitudinal study. Electronic records of patients treated at the Instituto Nacional de Neurología y Neurocirugía (INNN) in Mexico with a diagnosis of IS between January 2017 and December 2021 were reviewed. TOAST classification was used to determine incomplete studies if they had missing one of the following: 24-hour Holter monitor, echocardiogram (transthoracic or transoesophageal), neck vessels study (computed tomography angiography or Doppler), and laboratory studies. Follow up was performed for up to 2 years.
Results: 331 patients were included, with a mean age of 58±16 years, 155(47%) were women, 82(24.9%) had an incomplete approach. IS recurrence was identified in 17 patients (5.14%) in the first 720 days from IS, of which 7/82(8.5%) had an incomplete approach, with a time to recurrence of 226[IQR 112-461]. In the Cox regression model, a Hazard Ratio (HR) of 2.86(95% CI 1.09-7.54) was obtained for IS recurrence in the group of patients with incomplete approach, maintaining this result even in the multivariate model adjusted for age, sex and days from the IS.
Conclusions: IS patients with undetermined aetiology by incomplete approach have a higher risk of IS recurrence, so, we strongly recommend to intensify approach measures from the first contact with patients.
Disclosure of interest: No

2423

ASSOCIATION OF CEREBRAL COLLATERAL CIRCULATION WITH FUNCTIONAL OUTCOME IN ACUTE ISCHAEMIC STROKE AFTER INTRAVENOUS THROMBOLYSIS IN MEXICO

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Background and aims: A good cerebral collateral circulation has been associated with greater benefit of intravenous thrombolysis (IVT) in acute ischaemic stroke (AIS). Our proposal was to compare functional outcome (FO) at discharge in patients with AIS undergoing IVT according to their collaterality.

Methods: Observational retrospective study that included patients with anterior circulation AIS undergoing IVT from May 2020 to December 2022 at the Instituto Nacional de Neurología y Neurocirugía (INNN) in Mexico. Imaging was evaluated using the Tan et al scale, considering a score of 0-1 as poor collaterality (PC) and 2-3 as good collaterality (GC). FO was assessed with the modified Rankin scale (mRs) at discharge as good (0-2) or poor (3-6).

Results: 96 patients with AIS undergoing IVT were included (mean age 69.7±16.6 years, 55.2% women), and 66(68.8%) had GC. In patients with GC mean age was lower (67.4±17 years versus 74.7±15 years; p=0.046), and also the NIHSS (12.4±6 points versus 16.2±6 points; p=0.004); ASPECTS was higher (8.1±1 points versus 6.4±2 points; p=<0.001), large vessel occlusion was less frequent [7(10.6%) versus 16(53.3%); p=<0.001] and also hemorrhagic transformation [7(10.6%) versus 15(50%); p=<0.001]. FO at discharge was better in patients with GC [39(59.1%) versus 4(13.3%); p=<0.001], with lower mortality [1(1.5%) versus 5(16.7%); p=0.011].

Conclusions: FO of patients with AIS undergoing IVT was better in patients with GC; suggesting an additional factor to consider in prognosis prediction.

Disclosure of interest: No

2492

Do all ASPECTS regions have the same functional impact at 90 days?

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Background and aims: ASPECTS (Alberta Stroke Program Early CT Score) is an indispensable scale in middle cerebral artery ischemic stroke. However, it is not clear whether all regions have the same prognostic value.

We analyzed the relation of each of the ASPECTS regions with functionality at 90 days.

Methods: We retrospectively analyzed demographic, radiological and clinical data of successful recanalizations (considered as TICI2B/3) with 90 days of follow-up at our centre between 2018-2020.

We then performed a logistic regression to determine the likelihood of each different ASPECTS lesion to have modified Rankin Score(mRS)>3, language, motor or gait impairment at 90 days via Odds Ratio(OR). Also performed a logistic regression with each ASPECTS score.

Results: We obtained 134 patients, 67 women, mean NIHSS 13,7. 66.2% of the patients presented mRankin0-2, 21% language, 33% motor and 20.17% gait impairment at 90 days.

M3 and M6 presented the highest OR of having mRS>3 nearly being statistically significant (M3=4.44, p=0.06; M6=4.05, p=0.08). For gait disturbance Lentiform(L)-M3 presented the highest OR (L=4.1, p=0.07; M3=5.1, p=0.06) and M1-M5 for motor impairment (M1=2.8 p=1.17; M5=3.8 p=0.17).

We did not find differences by ASPECTs score.

Conclusions: In our study, the M3 and M6 regions were the most likely to show differences in patient functionality at 90 days, L-M3 with gait impairment and M1-M5 with motor disturbances. Although more studies are needed in this area, knowing which brain regions most affect long-term functionality could help to optimize patient selection for recanalization therapies in patients that present unfavorable acute neuroimage.

Disclosure of interest: No

2536

Evaluation of clinical outcomes in posterior circulation stroke patients

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Background and aims: NIH Stroke Scale (NIHSS) is a golden standard in evaluating patients with acute stroke. However, its prognostic value is more accurate in patients with anterior circulation stroke, compared to the posterior circulation stroke (PCS). Recently, Alemseged et al. introduced adjusted NIHSS (postNIHSS) with emphasis on vertebrobasilar symptoms, adding postural instability and dysphagia into the evaluation. It proposes better identification of patients with potentially disabling stroke that might benefit from recanalization therapy.

We aimed to compare initial NIHSS, postNIHSS and their 3-month results vs. clinical outcomes measured by Berg Balance Scale (BBS), Activities of Daily Living (ADL) and Modified Rankin Scale (mRS).

Methods: A prospective monocentric study in the comprehensive stroke unit patients with acute PCS verified by brain MRI. Patient's clinical characteristics, initial and 3-month NIHSS, postNIHSS, BBS, ADL and mRS were calculated and analyzed.

Results: Between 01/2021 and 12/2021 we examined 43 patients that were admitted with acute PCS. 14 of them underwent acute recanalization treatment. There was no significant difference in 3-month mRS between patients with and without acute treatment (p=0.645). Initial postNIHSS (p=0.005) had stronger association with worse outcome than NIHSS (p=0.01). Initial postNIHSS had strong negative correlation with both initial and 3-month BBS (rho = -0,820, p <0.001 and rho = -0,533, p <0.001 respectively).

Conclusions: PostNIHSS identifies patients with potentially disabling stroke better than NIHSS and may be helpful in decision making of acute treatment. However, limitation of our study is a small sample and further validation on larger cohorts is recommended.

Disclosure of interest: No

2568

CLINICAL DETERMINANTS AFFECTING TIME-TO-DIAGNOSIS OF CEREBRAL VENOUS THROMBOSIS AND ITS IMPACT ON OUTCOME

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Background and aims: Cerebral Venous Thrombosis (CVT) corresponds to 0.5-1% of all strokes. Its manifestations are heterogeneous and often scarce, which frequently leads to late diagnosis and treatment. Aim: to characterize episodes of CVT and explore the relationships between clinical variables to late diagnosis and prognosis
Methods: Retrospective cohort study of CVT admitted to our centre between January/2016 and August/2022. Descriptive analysis of the different variables and comparative study using linear-regression and non-parametric tests.
Results: 32 patients were included, 56% women, mean age of 53years. The most frequent vascular risk factors were oral contraceptive use (67% of the women), smoking-habits (31%), and excessive-weight/obesity (31%). The most frequent presentation was headache (88%), which was the only symptom in 36%. The median time-to-diagnosis (TTD) was 3 days (0-90; IQR=0-14) and the median hospitalization time was 12 days (6-59; IQR=7-19). Altered-level-of-consciousness and the presence of intracerebral/subarachnoid haemorrhage negatively correlated with TTD (0 vs 5 days, p=0.037 and p=0.008, respectively). Headache showed a positive correlation with TTD (10 vs 1days, p=0.013 if isolated and 5 vs 0 days; p=0.036 if not isolated). There was a positive correlation between TTD, hospitalization time (p=0.047) and headache after discharge (p=0.014).
Conclusions: The results of the study show that headache and the absence of other symptoms delays the diagnosis of CVT. A longer time until diagnosis correlates with greater hospitalization time and morbidity after discharge, mostly in the form of persistent headache. A high suspicion is of the utmost importance since it allows early diagnosis and prompt treatment.
Disclosure of interest: No

STROKE COMPLICATIONS

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Comprehensive Epilepsy care model [CECM] for post stroke complications

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Background and aims: People having post-stroke-complications like epilepsy needs price-discounted-drugs & proper-nursing-care in Asian regeion. Appropriate public-health-program for supportive-care needed in rural/tribal areas of asia.
Methods: This is policy paper on stroke-patients-with-epilepsy.
treatment-cost of post-stroke-complications like epilepsy is very high for rural/tribal population. Over 82% patients in rural-asia cannot afford therapies. Since 2016 community-initiatives implemented to reduce epilepsy-therapy-cost. NGO's need to facilitate development of sound/sustainable nursing-care-programs in marginalised asian communities. need to Establish Uniform public-health-policy to develop of sound/sustainable stroke-care-programs.
Results: long-term therapy of post-stroke-complications like epilepsy out of reach for > 90% indian-patients. Rehabilitation/palliative care plans non-existent. Concrete proposals done only by 3 NGOs, 8 such projects currently running in asia. Of these none supported by WHO, 3 NGOs, 1 government & 4 private entities (38%) & 1 corporate/Pharma sector initiatives. Nursing care in rural/tribal areas is abysmal.
Conclusions: Community participation of NGO in administration of nursing-care/therapeutic-RX of post-stroke-complications like epilepsy very effective in terms of cost-management, better-compliance. Community mass intervention & low-cost drug-supply-projects proven useful in resource poor-nations. need collaborations with NGO-activist to address this burning allied-health-issue. Uniform govt public-health-policy needed to implement supportive –care-services.
Recommendations: Promoting dialogue between health-services & nurses accelerates health-care-efforts. nurses participation increases more Rx-compliance and improves treatment-outcomes in stroke-patients. This would reduce difficulties faced by patients from resource-poor-southern-countries. Via policy-paper, we advocate that WHO/ESO should form common-guideline-manual on this complex-issue affecting developing-countries.
needs indepth discussion at ESO-forums for better outcome in management of post stroke complications like epilepsy.
Disclosure of interest: No

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Assessment of QOL in stroke patients with epilepsy in resource poor settings

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Background and aims: Issues: gum hyperplasia, Fatigue, Sleeplessness, depression, anxiety common in stroke -epilepsy-sufferers. Supportive-care facility inaccessible in rural/tribal areas asia.
Objective: 174 persons die/year from epilepsy-complications yearly. statistically >90% anxiety, 68% experience unbearable-fatigue; 70% social neglect/humiliation, 54% sleeplessness, 37% complain gum hyperplasia and 64% depression. Importance of spirituality/religion in coping with epilepsy is increasingly recognized
Methods: This was a cross sectional study. We surveyed stroke-patients-with-epilepsy through QOL-questionnaires. After 14 weeks with psycho-social support, Counseling & palliative support with anti-depressants/ nutrition, QOL improved to statistically. 5 Traditional faith-healers involved for more psychological impact on patients family.
Results: Diazepam as adjuvant-drugs in 63% patients. 200 specialist palliative care beds required for our Rural/tribal population of 6,00,000. significant correlations between higher scores of spirituality with absence of depression, fatigue. Likewise higher scores of QOL (ANOVA $p < 0.001$) correlated with gum-issues. .
Conclusions: Life-span/QOL of stroke-patients-with-epilepsy depends on social acceptance & appropriate-supportive-care. NGO-personals should be trained in Palliative-care-services & rehabilitation. This study data used for patient advocacy. Spiritual well-being increases despair in chronic cases. Field of Spiritual/psycho-social/community support is fertile ground for further investigations for better management of neurology disorders in resource poor countries where specialized care is still inaccessible for majority population.
Disclosure of interest: No

944

Characteristics of hemiplegic shoulder pain differ according to the extent of the pain site

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Background and aims: Hemiplegic shoulder pain (HSP) occurs in 10-22% of hemiplegic patients, but the pain site may extend not only to

the shoulder but also to the upper and lower limbs of the affected side. In this study, we aimed to clarify the differences in the characteristics of HSP according to the spread of the pain site.

Methods: Thirty-two patients with shoulder pain after stroke were included in this study. The assessment items were pain intensity (NRS), neuropathic pain (NPSI, PainDETECT), catastrophic thinking (PCS-6), fear of movement (TSK-11), description of pain (SFMPQ-2 /NPSI each item), motor function (FMA), muscle tone (MAS), presence of sensory disturbance and allodynia. The patients were divided into two groups according to the pain site: shoulder pain alone (A) group (n=14) and pain spreading to the upper and lower limbs of the affected side including the shoulder (B) group (n=18). Continuous variables were compared between groups by Mann-Whitney U test and categorical variables by Fisher's exact test.

Results: Group B had significantly higher values for NPSI, PainDETECT, and PCS-6. In addition, "cramping pain", "pressure (spontaneous) pain", "numbness" and "tingling" were significantly higher in the description of pain.

Conclusions: In this study, when the pain site extends to the affected upper and lower limbs, factors such as neuropathic pain, psychological aspects, muscle/soft tissue pain, and dysesthesia were found to be stronger. Therefore, HSP should be considered for more comprehensive management depending on the extent of pain site.

Disclosure of interest: No

1005

Dysphagia assessment and risk of pneumonia in stroke

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Background and aims: Post-stroke dysphagia is a complication that influences the prognosis of patients with acute stroke, increasing the risk of aspiration pneumonia. Data regarding the prevalence of post-stroke dysphagia are highly variable and dependent on the evaluation protocol. Aim of the study: to evaluate the prevalence of dysphagia and aspiration pneumonia among patients with acute ischemic stroke.

Methods: Cross-sectional study that included patients with acute stroke admitted in the Department of Neurology, County Clinic Hospital Brasov. We evaluated the patients using a comprehensive standardized protocol. Dysphagia assessment was performed using the Gugging Swallowing Screen, fiberoptic evaluation of swallowing, FEDSS scale.

Results: 77 patients with acute stroke were included (58.44 % males) with a mean age of 61.4 ± 18.35 years. Mean NIHSS score at admission was 11.8 ± 5.7. Dysphagia was present in19 patients (24.67%) and persisted at hospital discharge in 8 patients (42.1%). Stroke severity was the most important predictive factor for the occurrence of dysphagia when compared with stroke territory or any other risk factors. Pneumonia was encountered in 31.57% of the dysphagic patients and presented a longer hospitalization duration in comparison with non-dysphagic patients (11.7 ± 4.6 vs. 8.6 ± 3.7 days). Mortality was higher in the dysphagic group when compared with the non-dysphagic group (26.31% vs. 12.06%).

Conclusions: Dysphagia has a high impact among stroke patients in regard of their clinical outcome, increased duration of hospitalization, necessity of institutionalization and mortality.

Disclosure of interest: No

1119

Consistencies among miscellaneous scales for evaluation of post-stroke dysphagia

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Background and aims: Post-stroke dysphagia (PSD) is the most common type of dysphagia. Stroke patients with sustained dysphagia have poorer outcomes. The severity of PSD is assessed using miscellaneous scales with unknown consistencies. We aim to investigate the consistencies among miscellaneous scales, which could aid in the assessment of PSD.

Methods: A total of 49 PSD patients were enrolled. Functional Oral Intake Scale (FOIS), Dysphagia Severity Scale (DSS), Ohkuma Questionnaire, Self-assessed screening test for masticatory ability, Eating Assessment Tool-10, and Repetitive Saliva Swallowing Test were performed. FOIS was performed by physicians, and DSS was conducted by both the physicians and nurses; the physicians used either videofluoroscopy (VF) or videoendoscopy (VE) for evaluation, while the nurses assessed PSD by observation and subjective judgment.

Results: When using VF (VF-DSS and VF-FOIS) as the gold standard for the evaluation, VE-FOIS (κ=0.625, 95% CI: 0.300 to 0.950, $p<0.001$) has a substantial agreement with VF-FOIS, and VE-DSS (κ=0.381, 95% CI: 0.127 to 0.636, p=0.007) has a fair agreement with VF-DSS. The weighted kappa of FOIS to DSS in VE (weighted κ=0.577, 95% CI: 0.414 to 0.740, $p<0.001$) is not lower than that in VF (weighted kappa=0.249, 95% CI: 0.136 to 0.362, $p<0.001$).

Conclusions: For both DSS and FOIS, only VE has a statistically significant agreement with VF.

Though VF has been viewed as the traditional gold standard of dysphagia screening, it has the limitations of being invasive and equipment-dependent. For PSD, VE could be considered as a substitution when VF is not available or suitable.

Inter-rater reliability among the scales and VF-FOIS.

Scales	κ (95% CI)	p-value
†*Ohkuma questionnaire*	0.016 (-0.090, 0.122)	0.778
†*Self-assessed screening test for masticatory ability*	0.109 (0.001, 0.217)	0.099
†EAT-10	0.034 (-0.084, 0.152)	0.590
†RSST	0.187 (-0.131, 0.504)	0.142
‡VE-FOIS	0.625 (0.300, 0.950)	<0.001

For statistical analyses and comparisons, VF-FOIS is categorized into "tube-dependent group" and "tube-independent group" for analysis.

† Scales of *Ohkuma questionnaire*, *Self-assessed screening test for masticatory ability*, EAT-10, and RSST are individually categorized into "severe group" and "mild group" for analysis.

‡ VE-FOIS is categorized into "tube-dependent group" and "tube-independent group" for analysis.

Inter-rater reliability among the scales and VF-DSS.

Scales	κ (95% CI)	p-value
†*Ohkuma questionnaire*	0.213 (-0.057, 0.484)	0.126
†*Self-assessed screening test for masticatory ability*	0.258 (-0.018, 0.534)	0.074
†EAT-10	0.269 (-0.006, 0.543)	0.060
†RSST	0.198 (-0.010, 0.406)	0.077
‡VE-DSS	0.381 (0.127, 0.636)	0.007
‡Nurse-DSS	0.105 (-0.183, 0.393)	0.474

For statistical analyses and comparisons, VF-DSS is categorized into "choking/aspiration group" and "without choking/aspiration group" for analysis.

† Scales of *Ohkuma questionnaire*, *Self-assessed screening test for masticatory ability*, EAT-10, and RSST are individually categorized into "severe group" and "mild group" for analysis.

‡ Scales of VE-DSS and Nurse-DSS are individually categorized into "choking/aspiration group" and "without choking/aspiration group" for analysis.

Comparison of VF and VE in analysis of the inter-rater reliability between FOIS and DSS.

Methods	Weighted κ (95% CI)	p-value	Agreement
†VF	0.249 (0.136, 0.362)	<0.001	Fair
‡VE	0.577 (0.414, 0.740)	<0.001	Moderate

† In VF, the consistency between "VF-FOIS" and "VF-DSS" was analyzed.

‡ In VE, the consistency between "VE-FOIS" and "VE-DSS" was analyzed.

Disclosure of interest: No

1295

Functional connectivity analysis in patients with post-stroke delirium

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Background and aims: Post-stroke delirium (PSD) is a common complication of acute ischemic stroke (AIS). Underlying neurobiological mechanisms remain poorly understood. Loss of functional connectivity was observed in postoperative delirium. The aim of this study was to explore whether functional connectivity strength differs between patients with and without delirium after AIS, located in the middle cerebral artery (MCA) territory.
Methods: In a dataset of 514 patients with AIS, we used a chart review based on DSM-5 criteria to diagnose PSD. A subset of 60 patients was randomly selected, all with MCA infarction: 30 with left MCA infarction (15 with and 15 without delirium) and 30 with right MCA infarction (15 with and 15 without delirium). For each patient, the first 8 artifact-poor epochs of 8 seconds were selected and functional connectivity strength (measured using phase lag index - PLI) was computed for the 4 frequency bands (delta, theta, alpha, beta) using Brainwave and averaged over all channels and epochs. Median PLI was compared between delirium and non-delirium using Mann–Whitney-U test (rejection null hypothesis for *P* value < 0.0125 after Bonferroni correction).
Results: Median PLI in the alpha band was significantly lower in the PSD group (0.128; IQR 0.0316) compared to patients without PSD (0,167; IQR 0.0849) (p-value <0.01). No significant differences in median PLI were observed in other frequency bands.
Conclusions: Preliminary results suggest that functional connectivity strength is reduced in the alpha frequency band in patients with PSD after MCA infarction, which is similar to postoperative delirium.
Disclosure of interest: No

1467

Post-stroke depression in Ukraine. The fog of war and innocent people

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Background and aims: Post-stroke depression (PID) can occur any time after a stroke, with an incidence ranging from 25% to 75%. Additional risk factors for PID include social upheaval and dramatic changes in lifestyles in humanitarian disasters, including during hostilities
The aim of the study was to assess the frequency of post-stroke depression in the civilian population in peacetime and in military conflict.
Methods: The study was performed at the Expert Health Medical Center (Odessa) in 2022. We compared the prevalence of PID manifestations according to our previous studies in the "pre-Covid" period (2016-2019, n=159), the period of large-scale quarantine restrictions associated with the coronavirus pandemic (2020-2021, n=108) and since the beginning of a large-scale invasion Russian troops to Ukraine (n=104). The prevalence of PID in patients was assessed using the HADS-D questionnaire. Statistical processing was carried out by methods of frequency and dispersion analysis using the software Statistica 14.0 (TIBCO, USA).
Results: It is shown that in the "pre-Covid period" the frequency of PID was 33.3%, during the period of quarantine restrictions it increased to 54.3%, and with the outbreak of war - up to 60.6%. The described increase in the frequency of PID is statistically significant (Yates' $\chi 2=262.4$ $df=1$ $p<0.001$)
Conclusions: With the outbreak of hostilities, the frequency of post-stroke depression in Ukraine doubled.
Disclosure of interest: No

1482

RECOGNITION AND DIAGNOSIS OF EARLY POST STROKE SEIZURES – A SYSTEMATIC SCOPING REVIEW

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Background and aims: Post-stroke seizures are associated with increased mortality, disability and recurrent hospital admissions. Seizures at onset of acute stroke (AS) or immediately after complicates clinical assessment and may be undiagnosed. Limited evidence and guidance exists on early post-stroke seizures (EPSS) during treatment for AS. We systematically scoped the literature and existing guidelines on EPSS in adults with acute ischaemic or intracerebral haemorrhagic stroke, to characterise current knowledge and practice.
Methods: This review followed PRISMA-SR guidelines. We searched Medline, CINAHL, Embase AND Cochrane Library databases up to October 2021, plus Grey Literature and guideline databases, all limited to English language. Reviewers selected records using a two-phase screening process of (1) title and abstract and (2) full-text according to the inclusion criteria: >18 years age; reporting on recognition or diagnosis of EPSS occurring within two weeks of stroke onset or during AS inpatient treatment. To capture all available knowledge, a broad range of published literature was retrieved. Discrepancies were resolved through discussion between reviewers. Data were charted and a narrative synthesis completed.
Results: Of 15,038 records screened, 15 reporting on bedside recognition and 279 on diagnosis of EPSS early were identified. Results indicate current knowledge is based on expert opinion and small or low-quality observational studies. There is no empirical evidence on bedside stroke unit observation and monitoring to support EPSS recognition and diagnosis.
Conclusions: This is the first known review focusing on EPSS. This review highlights variations in expert recommendations, current practice and identifies areas requiring additional research.
Disclosure of interest: No

1736

Association between post-stroke constipation and in-hospital cerebrovascular events in acute stroke

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Background and aims: Constipation is common in acute stroke patients; however, its impact on stroke prognosis is unknown. We investigated the risk of post-stroke constipation (PSC) for cerebrovascular events in acute phase of stroke.
Methods: We conducted a retrospective analysis of patients admitted to our hospital between January 2012 and March 2019 with onset of stroke within 7 days (NCVC stroke registry, ClinicalTrials.gov Identifier: NCT02251665) and daily defecation records for more than 7 days. PSC was defined as less than three bowel movements per week, based on the Rome IV criteria. Patient characteristics with and without PSC were assessed with univariable and multivariable analysis for association of PSC with cerebrovascular events during hospitalization.
Results: Among 5,069 patients with acute stroke (age, 73.2±12.6 years; women, 40.4%), 3,815 (75.3%) had cerebral infarction and 1,254 (24.7%) cerebral haemorrhage. During the hospitalization (23.2±13.7 days), PSC was observed in 3,481 patients (68.7%). Compared to the patients without PSC, those with PSC were older, less likely to be current drinkers, and more likely to have cerebral haemorrhage, oral feeding difficulties, diabetes mellitus, lower body mass index, and higher NIHSS score ($p<0.05$). In-hospital cerebrovascular events were more common in patients with PSC (7.6%) than those without PSC (5.9%), with significant differences in the events after multivariable analysis (odds ratio [95% CI], 1.31 [1.01–1.71]), particularly in haemorrhagic stroke events (2.68 [1.12–6.38]).
Conclusions: PSC was associated with in-hospital cerebrovascular events, especially haemorrhagic stroke. Treatment of PSC might serve as an effective stroke prevention strategy.
Disclosure of interest: No

1889

Single Center Analysis of Patients with Nonconvulsive Status Epilepticus caused by Cerebrovascular Diseases treated at Comprehensive Stroke Center Intensive Care Unit

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Background and aims: Nonconvulsive status epilepticus (NCSE), early and late onset, is a common complication in patients with cerebrovascular disease but it is difficult to recognize. NCSE is associated with neurological deterioration and increased morbidity and mortality. The aim of the study was to evaluate the clinical characteristics of patients with NCSE regarding to favourable and poor outcome.
Methods: Retrospective monocentric analysis of patients with NCSE associated with cerebrovascular diseases requiring continuous VideoEEG monitoring treated at comprehensive stroke centre ICU from January 2013 to December 2022. They were categorized by phenomenology, treatment, EEG patterns, NIHSS, age, medical history, morbidity, trigger, acute, and chronic lesion. All analysed patients met Salzburg consensus criteria for NCSE. Favourable functional outcome at discharge was defined as modified Rankin Scale 0-2.
Results: 33 patients, 20(61%) women, mean age 71 years were included. Mean NIHSS on admission was 9,7. Mean time of SE was 9,5 days, mean time of hospitalization days were 23. Good outcome at discharge occurred in 6(18%) patients. Poor outcome was 27(81%) including 6(15%) deaths. All patients with positive symptoms (e.g.rhythmic twitching of one or more muscle groups, tonic eye deviation, hippus or nystagmoid eye jerking) had poor outcome (p=0.026). Predictors for the poor outcome were atrial fibrillation, ischemic heart disease and history of stroke.
Conclusions: There were not any statistical differences in outcomes according to the etiology (acute or chronic lesion, ischemic or hemorrhagic stroke). The phenomenology of NCSE was demonstrated as a statistically significant difference between patients with favourable and poor outcome.
Disclosure of interest: No

2016

Infectious complications correlate with both discharge and 3 months follow-up functional status of ischemic stroke patients with haemorrhagic transformation

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Background and aims: Acute ischemic stroke (AIS) patients' course is dependent on numerous factors, including concomitant diseases and complications. Haemorrhagic transformation (HT) may aggravate the evolution of AIS and impact the functional recovery of the patients, regardless of other risk factors. The aim of our study was to assess the impact of infectious complications on AIS patients' outcome in the event of HT occurrence.
Methods: An analysis was conducted on a consecutive cohort of patients with AIS admitted to a tertiary neurological hospital from 2018 to 2022, to compare the risk factors and evolution of patients who developed HT – working group, and who didn't present HT – control group, during the hospitalization. The functional status at discharge and at 90-day follow-up were compared using the modified Rankin Scale (mRS).
Results: From 150 patients, 55 patients presented signs of bleeding at repeated brain imaging. Age, gender, and time to admission didn't differ between groups. The mortality rate and neurological disability was significantly higher in the working group, both at discharge (mortality, p=0.038; mRS, $p<0.001$) and 90 days follow-up (mortality, $p<0.001$; mRS, $p<0.001$). The correlation analysis revealed that in-hospital infectious complications correlated with the mortality (p=0.008) and disability of the AIS patients ($p<0.001$), with statistical differences for the working cohort ($p = 0.008$, OR = 2.98 (95% CI: 1.30 – 6.82).
Conclusions: In our study the infectious complications rate was significatively higher and worsened the course of AIS patients with concomitant HT.
Disclosure of interest: No

2225

WHEN IS IT SAFE TO FLY AFTER A STROKE OR TIA?

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Background and aims: Advising patients when it is safe for them to undertake air travel post-stroke or TIA is fraught with difficulty due to multiple factors needing to be considered including size of stroke, functional status, flight duration, co-morbidities, and ongoing investigations and treatments. The situation is further complicated by the fact that there are no clear local, regional, national, or international guidelines to aid this process. The decision for fitness to fly is usually based on assessment by the patients' stroke physician.
Methods: We searched and contacted for information available from (1) professional healthcare resources, (2) stroke patient support organisations, (3) airline industry, (4) aviation authorities (5) air travel insurance providers.
Results: There were no guidelines from National and International Stroke Organisations.
Fourteen major UK charter and commercial airlines were contacted and only 4 offered their own guidance whilst the remaining 10 advised the travel would be 'at the stroke physician's discretion'.
The top ten most used travel insurance providers in the UK were contacted and all advised that the decision to insure any patient is entirely dependent on the medical assessment made by their consultant stroke physician.
Conclusions: Presently there do not appear to be any clear or consistent guidelines regarding when it is safe to undertake air travel following a stroke or TIA. The decision is generally left to the consultant stroke physician who also does not have access to any evidence-based resources. Is there a need for further clarification?
Disclosure of interest: No

2282

Evaluation of the nature of hyperdensity on cranial CT after thrombectomy (I).Usefulness of magnetic resonance imaging

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Background and aims: The presence of hyperdense lesions in 24-hour control CT after MT have been attributed to cerebral hemorrhage (CH) or contrast extravasation (CE) without clear criteria to differentiate between them. In the first part of the study, we aim to assess if different sequences of MRI could allow us to differentiate between these two conditions.
Methods: Prospective, blind, unicentric study developed from 2018 to 2022 in a stroke center.
Patients presenting with acute ischemic stroke in territory of the MCA, treated with MT, with hyperdense lesions in 24-hour control CT. MRI (T1, T2, FLAIR, SW and echo-gradient) was performed within 72 hours when possible. If not, serial control CT was indicated.
Results: 36 patients (7,2%) of 497 treated with MT presented CT had hyperdense lesions. MRI was done in 16 (44,4%) patients and a second CT in 18. There were signs of CH 20 in, mixed (both CH and CE) in 12, and uncertain in 2, with no patient with CE only.
Considering SW and echo-contrast sequences, the area of hemorrhage was similar to the hyperdense lesion area of initial CT in all patients.
Conclusions: The present study shows that there is a substrate of haemorrhage throughout the area of initial CT hyperdensity, although in some patients there is also extravasated contrast.
Disclosure of interest: No

2305

Early dysphagia after mechanical thrombectomy predicts functional outcome and health-related quality of life in stroke patients

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Background and aims: Dysphagia is a frequent complication of ischemic stroke and is associated with worse outcomes. We aimed to characterize the findings of fiberoptic endoscopic evaluation of swallowing (FEES) in patients undergoing mechanical thrombectomy (MT) and study their impact on 3-month functional outcome and quality-of-life
Methods: This single-center study was based on a local registry of consecutive acute ischemic stroke patients undergoing MT during the period of 1 year. We analysed patients who received FEES within 5 days of hospital admission. We compared baseline demographic and clinical characteristics of patients with and without FEES-defined dysphagia were compared. We collected modified Rankin Scale (mRS) and individual index values of the European Quality of Life 5 Dimensions (EQ-5D-iv) at 3 months. Using univariable and multivariable binary logistic, ordinal and linear regression analyses we predicted 3-month outcomes for presence of dysphagia and for FEES-defined dysphagia severity.
Results: We included 137 patients with a median age of 74 years, 43.1% were female, median NIHSS was 12, 46,7% underwent additional intravenous thrombolysis, successful recanalization was achieved in 92.7%, and stroke-associated pneumonia occurred in 8% of patients. FEES-defined dysphagia was found in 81% of patients and silent aspiration was found in 31.4%. Presence of dysphagia and increasing severity of dysphagia were independently associated with increasing 3-month mRS score. Increasing dysphagia severity was independently associated with lower EQ-5D-iv.
Conclusions: Early FEES-defined dysphagia occurs in 4 in every 5 patients undergoing MT. Presence of dysphagia and increasing dysphagia severity predict worse functional outcome and worse health-related quality-of-life.
Disclosure of interest: No

2413

Clinical outcomes of patients with acute ischemic stroke receiving dexmedetomidine in the neurointensive care setting

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Background and aims: While some observational data suggests potential neuroprotective effects of dexmedetomidine on ischemic brain, its clinical use in acute ischemic stroke is largely limited due to its proposed link to cerebral vasoconstriction. We aimed to explore whether dexmedetomidine affects clinical outcomes of ischemic stroke patients requiring neurointensive care.
Methods: Data was abstracted from our prospective stroke registry and included consecutive ischemic stroke patients who underwent EVT for LVO and who were subsequently treated at our neurointensive care unit (01/2016-12/2022). Patients were compared according to dexmedetomidine treatment status. Intravenous dexmedetomidine was used alone or as adjunct treatment for endotracheal tube intolerance, withdrawal symptoms as well as transitioning from other sedatives, and delirium. Clinical outcomes were favorable functional outcome (mRS$\leqslant$2) and mortality at 90 days.
Results: Of 547 included patients, 103 (18.8%) were treated with dexmedetomidine. Dexmedetomidine patients were more frequently men (60% vs. 46%; p=0.01), had higher baseline NIHSS (18 vs. 16; p=0.001) and lower ASPECT (7 vs. 8 ;p$<$0.001) scores, and more frequently history of diabetes (41% vs. 30%; p=0.045) than patients not exposed to dexmedetomidine. While favorable functional outcome was less frequently observed in the dexmedetomidine than in the comparator group (10.7% vs. 29.3%; p$<$0.001), there was no difference in 90-days mortality (39.8% vs 33.1%; p=0.24). After adjusting for potential confounders, dexmedetomidine was associated with lower odds of favorable functional outcome (aOR 0.326, p=0.002).
Conclusions: Dexmedetomidine might be associated with unfavorable outcomes in ischemic stroke patients in the neurointensive care setting.
Disclosure of interest: No

2463

Post-stroke Pain – An observational study

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Background and aims: Pain is a common and complex entity with a significant impact on society. Despite the improvement in functional status on stroke patients, other less objective complications persist, namely post-stroke pain (PSP). Its prevalence accounts for 18 to 50%, being associated with worse functional status, cognitive deterioration, depression, and suicide. Our aim was to assess the prevalence of PSP, as well as determine its demographic and clinical characteristics.
Methods: Observational prospective cohort study including patients diagnosed with an ischemic or hemorrhagic stroke admitted in a Neurology ward, during a period of one year. Four evaluation moments were defined: upon ward admission, where demographic and clinical characteristics were detailed; and at 1, 3 and 6 months, where pain-related aspects were reassessed. Informed consent was obtained from all patients.
Results: 59 patients were identified, 62.7% male. Mean current age was 61.46 +/- 13.2 years. Ischemic stroke was the most frequent (86.4%) with involvement of middle cerebral artery in 40.7%. Acute-phase therapy was performed in 31.8% of cases (25.4% undergoing primary thrombectomy, 5.1% intravenous fibrinolysis and 1.7% both theraphies). 47.5% of patients had a history of chronic pain, mainly involving the spine (53.5%). At admission, 22% of patients reported new onset of pain, with headache being the most frequent (53.8%). In the reassessment at 1, 3 and 6 months, 29.6%, 38.3% and 36.9%, respectively, described pain complaints. 8.5% of patients had complaints compatible with neuropathic pain.
Conclusions: This study demonstrates the high prevalence of post-stroke pain, highlighting its multifocal nature.
Disclosure of interest: No

2592

Post Stroke Spasticity: A digital option for self-monitoring by affected patients

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Background and aims: Post-stroke spasticity (PSS) is a significant disability that affects up to 20 % of stroke victims. It develops during weeks and months after stroke. Risk factors include size of the stroke and and level of disability. It is important to identify patients early in the course of development to start treatment in time. Therefore screening tools for treatment referrals are important. (Hacker 2020)

Methods: Existing scales for PSS (Zorowitz 2017) often lack optimal feasibility for self-application. Therefore, we developed an app with the goal of an easy-to-use scale that allows the affected person or the family carer to identify incipient PSS.
Workshops between experienced neurologists and leading therapists identified the most frequent signs in everyday life and ranked their predictive value. The resulting 10 symptoms were then formulated using a 3-level scale and exemplified by short videoclips of typical patient examples for repeated self-assessments and programmed as an app .
Results: A tool for self-assessment of PSS was developed. The app is based on few predictive routine data from the stroke unit and repeated self-assessments by patients or relatives regarding symptoms of the upper and lower extremity. The app is available for free download in different European languages. Usage is continuously increasing.
Conclusions: The monitoring of PSS in time is important for proper treatment referral. Insufficient treatment so far is often caused by a lack of proper detection. Enabling affected patients and carers by an app seems suitable and better accessed than scores by professionals.
Disclosure of interest: No

CEREBROVASCULAR MANIFESTATIONS OF COVID-19 AND OTHER INFECTIONS

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IVIG FOR VACCINE-INDUCED IMMUNE THROMBOTIC THROMBOCYTOPENIA (VITT)

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Background and aims: VITT appears similar to heparin-induced thrombocytopenia (HIT) in that 'platelet activating' autoantibodies are produced in both these conditions due to prior exposure of COVID-19 vaccine & heparin respectively, in turn causing thrombotic complications & consumptive thrombocytopenia. Similar to its use in HIT, the rationale of using IVIG in VITT is expectant interruption of VITT antibody-induced platelet activation.
Methods: A comprehensive search of PubMed from March 2020 to December 2022 was made using 3 search items: COVID-19, VITT, IVIG. The search items were combined using the Boolean operator.
Results: In a new nonrandomized study involving 99 individuals with VITT-CVT (VITT patients presenting with cerebral venous thrombosis [CVT]) from 71 hospitals in 17 countries, receipt of IVIG was associated with lower mortality (29 versus 70 percent). Mortality rates were not significantly influenced by the choice of anticoagulant therapy (heparin vs. non-heparin) (37 versus 33 percent) & receipt of platelet transfusion. In another series of 5 individuals with VITT & various thrombotic manifestations treated with IVIG, after a rapid but *transient* platelet count recovery, one patient developed *recurrent* thrombocytopenia & *new* CVT. Based on this, *clinicians need to monitor serial platelet counts post-IVIG therapy while inpatient & post-discharge.*
Conclusions: Growing evidence suggests that unless contraindicated, anticoagulation & IVIG should be used in *all* VITT- confirmed patients. In VITT-suspected patients, initiation of empirical IVIG is also advised while awaiting the results of the confirmatory testing. A suggested dose is 1 gm/kg (actual body weight) intravenously once per day for 2 days.
Disclosure of interest: No

664

Cerebrovascular reactivity and cognition after COVID-19 pneumonia. Case - control study

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Background and aims: COVID-19 pneumonia had been related with cognitive impairment (CI) with scarce information about mechanisms. The aim of this study is to identify the association of cerebrovascular reactivity (CVR) y Transcranial Doppler (TCD) and the CI after COVID-19 infection.
Methods: We performed a case control study of patients recovered from COVID-19 pneumonia aged 18 or older, admitted to the hospital in the first wave of pandemic in México (2020). All patients signed informed consent forms and were assessed 3 months after discharge, with cognitive battery and TCD comparative with patients recovered from hospitalization for conditions not associated with COVID-19 infection (controls consented to participate in the study and were age- and sex- matched whit the case group). Other clinical variables were obtained.
Results: We included 20 cases and 20 age- and sex- matched controls. Table 1 shows the clinical and demographic characteristics of both groups. Table 2 shows the parameters from TCD. Impairment of cerebrovascular reactivity (CVR) of the left MCA was associated with cases compared with control group (OR 5.6, IC95%1.2-25.6, $p < 0.041$), and CI (<26) was also associated with patients recovered from COVID-19 in comparison with the control group (OR 10.2, CI95%: 1.12-93.3, $p < 0.044$). There was no correlation between CVR and MoCA test score at 3 months after discharge (r -0.134, p=0.4).
Conclusions: COVID-19 pneumonia is associated with CI in recovered survivors and with decrease of CVR, and possibly this mechanism could be part of the pathogenesis to develop CI.
Disclosure of interest: No

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CLINICAL CHARACTERISTICS OF PATIENTS WITH ACUTE ISCHEMIC STROKE PREVIOUSLY VACCINATED AGAINST COVID-19

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Background and aims: To examine the clinical characteristics of patients with acute ischemic stroke, previously vaccinated against Coronavirus Disease 2019 (COVID-19) and determine whether the vaccine had impact on outcome.
Methods: The clinical characteristics of 58 stroke patients, previously vaccinated against COVID-19 were analyzed. We analyzed demographic

characteristics, risk factors, type of stroke and outcome. Also, we compared outcome of those patients with outcome in stroke patients hospitalized in the same period but not vaccinated, patients hospitalized during the pandemic, before vaccination began, and stroke patients hospitalized before the pandemic. Further, we compared mortality rate with mortality rate in patients who had acute ischemic stroke and COVID-19 simultaneously.

Results: The mean age of the patients was 71.0 years, most were male (58.6%), mostly with risk factors for stroke. In the largest number of patients, 17 (29.3%), the etiopathogenetic mechanism of stroke was atherosclerosis of the large arteries. Mortality in vaccinated patients was identical to mortality in stroke patients before pandemic, without significant difference from mortality in unvaccinated patients (13.8% versus 8.6%; p= 0.23). The mean NIHSS and mRS score at discharge for all examined groups were without significant difference. A significant difference in mortality was found between COVID-19 positive and COVID-19 negative stroke patients (37.8% versus 18.1%; p=0.001).

Conclusions: There are no significant differences in clinical characteristics of stroke in vaccinated compared to unvaccinated patients. We did not find a connection between vaccination and stroke.

Disclosure of interest: No

1691

COVID-19 and antiviral drugs as risk factors for PRES and RCVS? A systematic review and case report analysis

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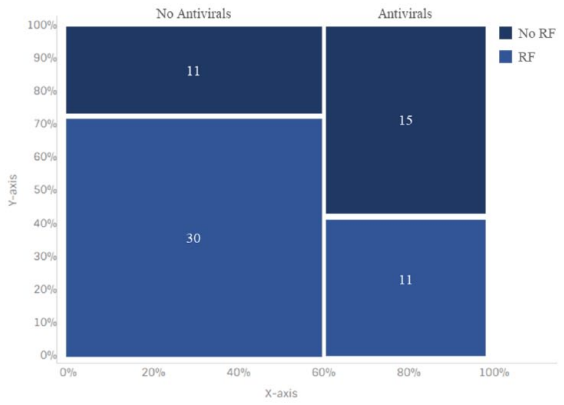
Background and aims: During the SARS-CoV2 pandemic, several cases of PRES and RCVS in COVID-19 patients have been reported, but the link between these syndromes and COVID-19 is unclear. This review aims to investigate whether SARS-CoV-2 infection or therapies used to treat COVID-19 could be potential risk factors for the development of PRES or RCVS.

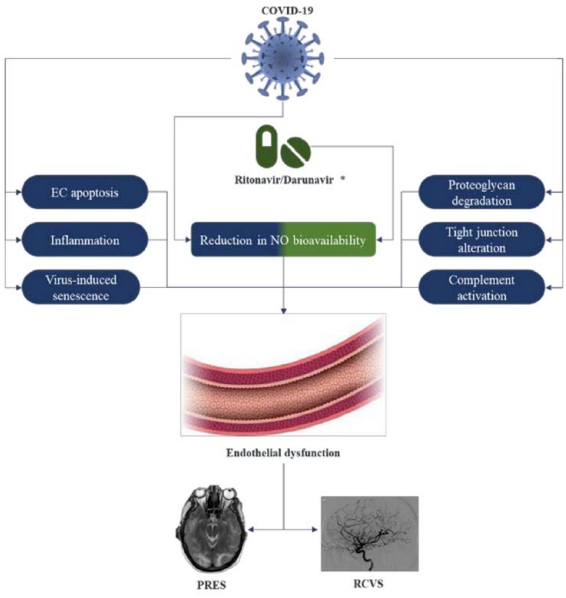
Methods: We conducted a systematic review using the PRISMA statement, searching for case reports of patients with COVID-19 who developed PRES and/or RCVS in PubMed, Scopus, and Web of Science. We analyzed the clinical characteristics of the two populations separately and performed statistical analysis to search for other independent risk factors.

Results: We found 70 articles involving 105 patients (85 with PRES, 20 with RCVS). Our analysis revealed a lower incidence of common risk factors for PRES and RCVS in patients with COVID-19, suggesting that COVID-19 may be an independent risk factor for both diseases. This may be due to the ability of SARS-CoV-2 to induce endothelial dysfunction, which is a common cause of both RCVS and PRES. Additionally, our analysis found a statistically significant increase in the use of ritonavir or darunavir among individuals without known risk factors for PRES and RCVS (Figure 1). It has been observed that these drugs can also disrupt the endothelium by reducing the bioavailability of nitric oxide.

Conclusions: We found correlation between PRES, COVID-19, and antiviral therapy for COVID-19 (Figure 2). Further research is necessary to confirm these findings, using larger sample sizes and randomized control groups.

Disclosure of interest: No





1743

COVID-19 Effects on Clinical Outcomes of Acute Ischemic Stroke Patients: A Hospital-based Study with 6 Months Follow-up

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Background and aims: Neurological manifestations, such as stroke, are common in COVID-19, almost affecting more than half of these patients. It is still unclear whether patients with concurrent stroke and COVID-19 have worse functional outcomes compared to stroke patients without COVID-19.

Methods: We conducted a prospective, observational, single-center cohort study in Tehran, Iran. Recruitment was consecutive from March to September 2021. Patients with acute ischemic stroke within 48 hours and a former mRS score of 0 to 3 were included. Demographic information, vascular risk factors, prior mRS score, NIHSS score, and hospitalization duration were collected. Primary end point was functional outcome at 6 months. A favorable outcome was defined according to the previous mRS score. The secondary outcome was mortality at 6 months. We performed mRS shift and multivariable analyses.
Results: We investigated 237 patients (mean age 70.14, 62.5% men). Almost 30.7% had COVID-19. The odds of favorable outcome /poor outcome based on the mRS score of COVID-19 and the non-COVID-19 group was OR 0.457, 95% CI: 0.253-0.827, demonstrating the poor prognosis in COVID-19 compared to non-COVID-19 patients. The mortality rate was 55.4%% among patients with COVID-19 and 44.6% among the non-COVID-19 group, shows a significantly higher risk of death in the COVID-19 group (P-value$<$0.001). These findings showed notable poor outcomes in stroke patients with COVID-19 than patients without COVID-19 (RR: 1.44).
Conclusions: Patients with AIS and COVID-19 have more severe strokes, higher mortality, and poorer outcome than AIS patients without COVID-19. However, functional outcome is comparable in both groups.
Disclosure of interest: No

1894

IMPACT OF COVID-19 IN ACUTE ACUTE ISCHEMIC STROKE IN THE VACCINATION ERA: Data from the Ilercovid project

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Background and aims: There is few previous evidence about the effect of COVID-19 vaccination in the outcome of patients with acute ischemic stroke (AIS). We investigated this potential association in a prospective cohort of acute ischemic patients (ILERCOVID project).
Methods: All patients were evaluated as stroke code between May 2021 and September 2022. Clinical variables, aetiology, multiparametric imaging data and outcomes at discharge were evaluated. Reverse transcription polymerase chain reaction for COVID-19 was performed in all cases. We compared COVID-19 patients versus non COVID 19 patients.
Results: A total of 497 patients were included in the study. Mean age was 72.6 (14.5) years. 200 (40.3%) patients were female. Median basal NIHSS score and mRS at discharge were 5.0 (2.0-10.0) and 2.0 (1.0-4.0) respectively. Large vessel occlusion (LVO) was observed in 143 (28.8%) patients. 444 (89.3%) had been vaccinated (mean vaccinations: 2.4 [1.0]). Only 34 (6.8%) of them were infected by COVID-19 positive (mean cycles: 27.6 [8.0]). 8 (23.5%) of them had respiratory symptoms at stroke onset. In contrast to previous studies performed in the early COVID-19 pandemic, no significant differences were observed in age, distribution of vascular risk factors, stroke severity, proportion of LVO and outcomes between both groups. COVID-19 patients had a higher proportion of cardioembolic stroke (41.9% vs. 29.8%, p-value 0.011).
Conclusions: In the era of vaccination, COVID-19 infection seams not to affect the presentation and outcome of AIS.
Disclosure of interest: No

ATHEROSCLEROSIS AND STROKE

600

Surgical strategy based on the intra-operative findings of mobile carotid plaque

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Background and aims: Mobile carotid plaques (MCP) are associated with a high risk of repeated ischemic stroke due to the vulnerable lesion with unknown natural history. Based on our surgical experience related to the preoperative ultrasound imaging, we classified MCP to establish a consistent surgical strategy.
Methods: We retrospectively analyzed 542 consecutive surgical cases in patients with carotid stenosis in New Tokyo Hospital between January 2016 and December 2022.
Results: We performed surgical procedures for 25 MCP cases (4.6%), in which 23 cases had Carotid Endarterectomy (CEA) and 2 cases had Carotid Arterial Stenting (CAS). In CEA group, we detected characteristic plaque types, including " True mobile type" as a solid mobile plaque lesion for 15 cases (65%), " Thrombus type" as a thrombus dominant lesion for 4 cases (17%) and " Membranous type" as a thin fibrous flap for 3 cases (13%). For one case 4.3%), there was none of mobile plaque as "Pseudo-type". We performed CAS only for "Membranous type". All patients had no complication related to surgical procedures.
Conclusions: MCP are not as rare as previously reported as demonstrated above. Hence it would become more important to develop a strategic surgical treatment in accordance with MCP characterization. For "True mobile type" and "Thrombus type", we should perform CEA immediately after diagnosis. For "Membranous type", we perform CAS because of the lower risk for embolic complication.
Disclosure of interest: No

914

BASELINE CHARACTERISTICS AND OUTCOME OF PATIENTS AFTER ENDOVASCULAR THERAPY OF ACUTE LARGE VESSEL OCCLUSION ACCORDING TO THEIR HISTORY OF SYMPTOMATIC DISEASE AND SEX

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Background and aims: The aim of this study was to investigate baseline characteristics and outcome of patients after endovascular therapy (EVT) for acute large vessel occlusion (LVO) in relation to their history of symptomatic vascular disease and sex.
Methods: Consecutive EVT-eligible patients with LVO in the anterior circulation admitted to our stroke centre between 04/2015-04/2020 were included in this observational cohort study. All patients were treated according to a standardised protocol. Baseline characteristics and successful reperfusion, recurrent/progressive in-hospital ischaemic stroke, symptomatic in-hospital intracranial haemorrhage, death at discharge and at 3 months, and functional outcome at 3 months were analysed according to previous symptomatic vascular disease and sex.
Results: 995 patients with LVO in the anterior circulation (49.4% women, median age 76 years, median admission NIHSS score 14) were included. Patients with multiple vs. no previous vascular events showed higher mortality at discharge (20% vs. 9.3%, $_{\text{age/sex-adjusted}}$OR=1.43;p=0.030) and less independency at 3 months (28.8% vs. 48.8%,age/sex-adjusted OR=0.72; p=0.020). Patients overall (19.9% vs. 6.4%,age/sex-adjustedOR=1.76;p=0.028) and men alone (16.7% vs. 5.8%, $_{\text{age-adjusted}}$ OR=2.20;p=0.035) with one or multiple vs. no previous vascular events showed more recurrent/progressive in-hospital ischaemic strokes. Men vs. women showed more in-hospital symptomatic intracranial hemorrhage (23.7% vs. 6.6% in men and 15.4% vs. 5.5% in women, OR=2.32;p=0.035/age-adjustedOR=2.36;p=0.035) among patients with one or multiple vs. no previous vascular events.
Conclusions: Previous vascular events increased the risk of in-hospital complications and poorer outcome in the analysed patients with EVT-eligible LVO. Our findings may support risk assessment in these patients and could contribute to the design of future studies.
Disclosure of interest: No

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Distinct lipid profiles of radiation-induced carotid plaques from atherosclerotic carotid plaques revealed by UPLC-QTOF-MS and DESI– MSI

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Background and aims: Radiotherapy is a standard treatment for head and neck tumors that significantly increases patients' long-term survival rates. However, late cerebrovascular complications, especially carotid artery stenosis (CAS), have gained increasing attention. Investigation of biomarkers of radiation-induced CAS may help to elucidate the mechanism by which radiation induces damage to blood vessels and identify possible preventive measures against such damage.
Methods: In this study, we used lipidomics strategy to characterize the lipids present in 8 radiation-induced carotid plaques (RICPs) and 12 atherosclerotic carotid plaques (ASCPs). We also used desorption electrospray ionization–mass spectrometry imaging (DESI–MSI) to map the spatial distribution of the screened lipids from 2 RICPs samples and 2 ASCPs samples.
Results: The results showed that 31 metabolites in RICPs were significantly higher than that in ASCPs, 24 of which were triglycerides (TGs). We used four machine learning models to select potential indicators from the 31 metabolites. Six TGs [TG(17:2/17:2/18:0), TG(17:1/17:2/18:0), TG(17:0/17:2/18:0), TG (17:2/17:2/20:0), TG(17:1/17:2/20:0), TG(15:0/22:0/22:2)] were found to be the potential markers for distinguishing RICPs and ASCPs (AUC = 0.83). The DESI–MSI results suggested that the 6 TGs were localized in the collagen fiber regions and confirmed the differences of these TGs between the two kinds of plaques.
Conclusions: The 6 TGs primarily localized in the collagen fiber regions of plaques are likely to be potential indicators for the differentiation of RICPs from ASCPs which may have implications in the mechanisms and possible preventive measures against RICPs.
Disclosure of interest: No

1060

CAROTID ATHEROSCLEROSIS AND VASCULAR RISK FACTORS IN PATIENTS WITH ACUTE ISCHAEMIC STROKE IN A TERTIARY CARE HOSPITAL IN NEPAL

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Background and aims: Atherosclerosis of the carotid arteries is one of the most important causes of ischaemic stroke. Studies addressing carotid atherosclerosis and its risk factors are not available in Nepal. This research aimed to determine the prevalence of carotid atherosclerosis and its association with vascular risk factors in patients who presented with acute ischaemic stroke in a tertiary care hospital in Nepal.
Methods: In this prospective observational study, the data were collected by convenience sampling and analysed by the Statistical Package for the Social Sciences version 26. Computed tomography angiography was used to diagnose carotid atherosclerosis. The association between vascular risk factors and carotid atherosclerosis was analysed by using Chi-square test. The risk factors which were significantly associated with atherosclerosis were further analysed by using binary logistic regression analysis.
Results: Out of 145 patients, 53.1% were male. The most common risk factor was dyslipidaemia (n=140; 96.6%). Atherosclerosis of the carotid arteries was present in 62 (42.8%) patients (extracranial 38.6%, intracranial 11.7% and combined 7.6%). Stenosis of the carotid artery was present in 18 (12.4%) patients. In univariate analysis, age more than 50 years, hypertension, diabetes and smoking were significantly associated with atherosclerosis. However, in multivariate logistic regression analysis, only age more than 50 years (p= 0.007) and diabetes (p=0.047) were significantly associated.
Conclusions: Carotid atherosclerosis is common in patients who presented with acute ischaemic stroke in a tertiary care hospital in Nepal. Age more than 50 years is strongly associated with the presence of carotid atherosclerosis.
Disclosure of interest: No

1265

Evolution of symptomatic intracranial atherosclerotic disease under medical treatment: a systematic review

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Background and aims: Intracranial atherosclerotic disease (ICAD) is a dynamic disease. Understanding the evolution patterns of symptomatic ICAD (sICAD) under medical treatment could inform secondary prevention in affected patients. We aimed to systematically review relevant evidence published in the last 2 decades.
Methods: Following the PRISMA and MOOSE statements, we searched PubMed and OVID, and screened for full-text articles reporting evolution

of sICAD in the degree of luminal stenosis, plaque morphology or components, under medical treatment in adult humans, published in English since 2001. The minimal interval between baseline and follow-up imaging exams for assessing sICAD evolution was 1 month.
Results: Among 632 articles retrieved, 12 studies (1,100 patients) were systematically reviewed, 9 of which were conducted in East Asia. Transcranial Doppler (TCD), time-of-flight MR angiography (TOF-MRA), CT angiography and intracranial vessel wall MR imaging (VWI) were respectively used in 4, 4, 1 and 4 studies to assess sICAD evolution under medical treatment. TCD and TOF-MRA were mostly used in earlier studies, with a focus on progression/regression in the luminal stenosis. VWI has been increasingly used in recent studies to reveal the evolution in plaque components (e.g., enhancement) and morphology (e.g., remodeling) in sICAD. However, definitions of progression/regression of the sICAD lesion varied among different studies, hence the inconsistent findings on these evolution patterns.
Conclusions: Despite the inconsistent findings on the evolution patterns of sICAD treated medically, these studies reinforced sICAD as a dynamic disease. Vigorous efforts are needed to picture the evolution patterns of sICAD under medical treatment.
Disclosure of interest: No

1513

CHARACTERIZATION OF AORTIC AGING USING 3D MULTI-PARAMETRIC MRI

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Background and aims: We comprehensively studied morphological and functional aortic aging in a population study using modern three-dimensional MR imaging to allow future comparison in patients with diseases of the aortic valve or aorta.
Methods: We followed 80 of 126 subjects of a population study (20 to 80 years of age at baseline) using the identical methodology 6.0±0.5 years later. All underwent 3 Tesla MRI of the thoracic aorta including 3D T1 weighted MRI (spatial resolution 1mm3) for measuring aortic diameter and plaque thickness and 4D flow MRI (spatial/temporal resolution= 2mm^3/20ms) for calculating global and regional aortic pulse wave velocity (PWV) and helicity of aortic blood flow.
Results: Mean diameter of the ascending aorta (AAo) decreased and plaque thickness increased significantly in the aortic arch (AA) and descending aorta (DAo) in females. PWV of the thoracic aorta increased (6.4±1.5 to 7.0±1.7m/s and 6.8±1.5 to 7.3±1.8m/s in females and males, respectively) over time. Local normalized helicity volumes (LNHV) decreased significantly in the AAo and AA (0.33 to 0.31 and 0.34 to 0.32 in females and 0.34 to 0.32 and 0.32 to 0.28 in males). By contrast, helicity increased significantly in the DAo in both genders (0.28 to 0.29 and 0.29 to 0.30, respectively).
Conclusions: 3D MRI was able to characterize changes in aortic diameter, plaque thickness, PWV and helicity during six years in our population. Aortic aging determined by 3D multi-parametric MRI is now available for future comparisons in patients with diseases of the aortic valve or aorta.
Disclosure of interest: No

2166

Progression of carotid atherosclerotic stenosis with best medical management

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Background and aims: The role of surgery for asymptomatic carotid artery stenosis remains unclear due to limited data on the prognosis of asymptomatic stenosis under advanced best medical management. This study investigates the progression of carotid stenosis under current medical management.
Methods: Carotid doppler ultrasounds (CDU) performed in 2015 and 2016 were screened. Cases with ⩾60% stenosis were reviewed for follow-up CDUs and their clinical progression.
Results: Of 5246 CDUs performed during the study period, 512 patients were found to have ⩾60% stenosis. After excluding patients with no or <3 months follow-up, and those who underwent carotid endarterectomy (CEA), 69 patients were included.
Of the 69 patients, 27 had worsening stenosis at a median follow-up period of 48 months. Twenty-one (78%) of these had symptomatic stenosis at initial CDU.
The remaining 42 patients had no progression in carotid stenosis at a median follow-up period of 33 months. 50% of them were symptomatic at initial CDU.
21 of the 42(50%) patients with initial symptomatic stenosis had subsequent progression of stenosis, while 6 of the 27 (22%) asymptomatic patients had subsequent progression. 19 of the 21 (90%) symptomatic patients with worsening stenosis had recurrent symptoms, while 7 of the 42 (17%) patients with no progression of stenosis had recurrent symptoms.
Conclusions: Patients with symptomatic stenosis were more likely to have progression of stenosis compared to patients with asymptomatic stenosis at initial presentation. Patients with worsening stenosis were more likely to have recurrent symptoms than those without progression.
Disclosure of interest: No

2412

Selective screening for asymptomatic carotid artery stenosis

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Background and aims: Extracranial carotid stenosis (CS) is the cause of approximately 20% of all ischaemic strokes. Routine screening for asymptomatic carotid stenosis (ACS) has been discouraged for several reasons, including the low prevalence of ACS and the lack of cost-effectiveness. European Stroke Organization Guidelines have not addressed this issue. We aimed to examine the characteristics of patients admitted to a Stroke Unit with an ischaemic event and severe symptomatic CS.
Methods: Characterization of patients admitted to a tertiary hospital's Stroke unit (2017-2022) with stroke/TIA and severe (⩾70%) symptomatic CS. A descriptive analysis was performed including vascular risk factors (hyperlipidemia, diabetes, hypertension, current smoking) and coronary artery disease, previous carotid Doppler, previous documented carotid stenosis and previous medical therapy.

Results: 179 patients were included, with a median age of 67 [IQR 60-76] years, 69% were men and 67% had ⩾2 risk factors. Regarding previous medical therapy, 42% were on a statin and 33% were on antiplatelets. Of the 134 patients that we had access to pre-event exams, only 31(20%) had performed carotid Doppler and 24 of them (77%) had CS ⩾50%.
Conclusions: The high prevalence of vascular risk factors and lack of prior adequate medical therapy in our patient group suggest the need for a more efficient screening of patients that might benefit from primary prevention of stroke. The 2023 European Society for Vascular Surgery Society guidelines recommend selective ACS screening in patients with ⩾2 vascular risk factors to optimize risk factor control and medical therapy.
Disclosure of interest: No

RARE CAUSES, STROKE IN THE YOUNG (INCLUDING PAEDIATRIC STROKE)

115

Fulminant Focal Reversible Cerebral Vasoconstriction Syndrome presenting as a Large Vessel Occlusion

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Background and aims: Reversible cerebral vasoconstriction syndrome (RCVS) is a rare cerebrovascular disease with varied presentation. We report a case of intracranial large vessel occlusion of initially unclear etiology, which was likely RCVS-related vasospasm.
Case report.
Results: A 31-year-old man with history of bodybuilding, growth hormone and THC use, and recent COVID-19 infection presented with one week of thunderclap headaches and left hemispheric syndrome from occlusion of the intracranial left ICA to M1 segment. Endovascular clot retrieval was unsuccessful; a stent was subsequently deployed in the ICA with complete recanalization.
He presented three weeks later with recurrence of his symptoms. Imaging revealed convexity subarachnoid hemorrhage and vasospasm in the M3 segment treated with intraarterial (IA) milrinone. He was maintained on calcium channel blockers for suspicion of RCVS, and solumedrol for concern for vasculitis. The patient had two angiograms with IA vasodilator administration for vasospasm; the second was complicated by intracranial hemorrhage due to reperfusion injury. Though contrast MRI revealed concentric enhancement of the LMCA vessel wall suspicious for vasculitis, spinal tap revealed normal protein and WBC count. Strong suspicion of RCVS led to discontinuation of corticosteroids and he improved after hemodynamic augmentation.
Conclusions: This case highlights an atypical presentation of RCVS. While intracranial ICA involvement, initially unifocal vasospasm, and concentric arterial wall enhancement challenged an RCVS diagnosis, recurrent thunderclap headaches, convexity SAH, vasoactive triggers, and vasodilatory response to milrinone supported it. Intracerebral hemorrhage following IA vasodilation supports synergistic mechanisms of endothelial and autoregulation dysfunction secondary to RCVS and COVID-19.

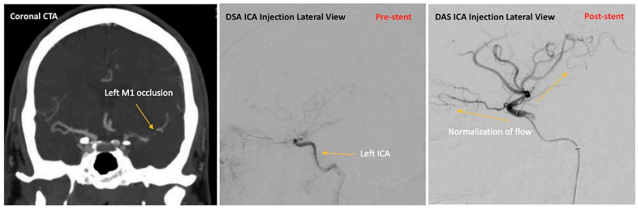

Figure 1: Patient's initial presentation and intracranial stenting of the left ICA with revascularization of the left ACA and MCA territories.

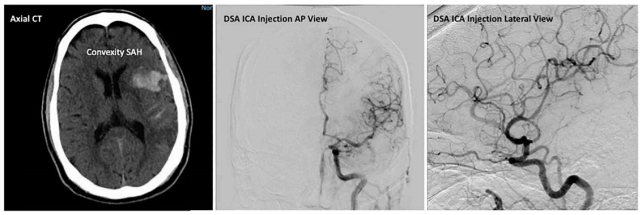

Figure 2: Patient's second presentation with left convexity SAH and evidence of potential M3 segment vasospasm.

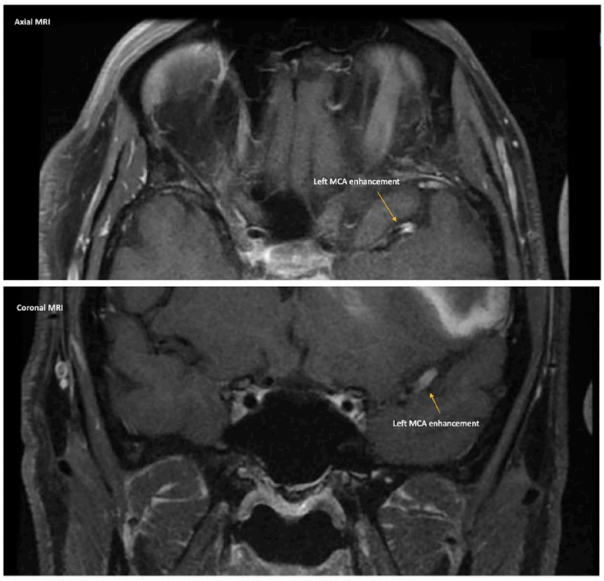

Figure 3: Concentric enhancement of left MCA suspicious for vasculitis changes

Disclosure of interest: No

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A MIXED-METHODS ANALYSIS OF EXPERIENCES AND UNMET NEEDS OF INDIVIDUALS WITH CADASIL

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Background and aims: Compared to the general stroke population, those with stroke due to Cerebral Autosomal Dominant Arteriopathy with Subcortical Infarcts and Leukoencephalopathy (CADASIL) represent a high-risk and care-deprived group lacking dedicated treatments or services. This study aims to evaluate the health status and needs of patients with stroke due to CADASIL to inform targeted, multidisciplinary interventions.
Methods: We conducted a two-part mixed-method study: 1) a quantitative assessment of health and wellbeing in CADASILstroke patients through a bespoke online survey focusing on functional and cognitive effects and 2) a qualitative study of semi-structured phone interviews exploring experiences of patients (or carers) with poststroke care to identify key healthcare gaps. The survey included demographics, stroke severity, and poststroke symptoms/complications, along with validated well-being instruments assessing fatigue, apathy, and quality of life (QoL). We transcribed audiorecorded interviews verbatim, and independently

thematically analyzed them (manual inductive coding with consensus discussion ± respondent validation) alongside a phenomenological lens to explore the essence of participants' experiences.

Results: To date, we interviewed 8 patients with CADASIL with 6 completing the survey. We have analyzed 5 interviews and 6 surveys. Three core themes emerged from the interviews: juxtapositions around knowledge of CADASIL, management of CADASIL, and fear/concern about the impact of the disease. Results are shown in the table.

Conclusions: Our results highlight the substantial impact of CADASIL on physical and mental well-being and overall QoL with multiple unmet concerns. More information/education is necessary to ensure higher-quality care and support further research into a cure/treatment for CADASIL.

Quantitative Analysis	
Sex (% men)	8/8 (100%)
Age (mean)	57.75 years (range: 38-71)
Time since diagnosis (mean)	1.8 years (±0.7)
Number of (lifetime) Strokes (mean)	2.2 (±0.9)
modified Rankin Score (mRS) (median)	1.4 (range: 0 to 4)[ϕ]
PROMIS 10 scale[*]	
Global Physical Health score[†]	11.37 ± 2.44 (T-score = 38.27± 6.35)[§]
Global Mental Health score[†]	9.75 ±3.01 (T-score = 37.88 ±7.47)[§]
MFI-60[¥]	63.33± 4.3
Patients defined as having severe fatigue	6/6 (100%)
AES-10[ƒ]	28.83 ±7.57
Patients defined as having apathy	6/6 (100%)

[ϕ]Corresponds to a rating of "no significant disability"
[*]PROMIS 10 (Quality of Life).
[†]Scored using a 5-category scale ranging from excellent, very good, good, fair, poor health)
[§]Corresponds to a rating of "fair"
[¥]Multidimensional Fatigue Inventory (MFI-60)
[ƒ]Apathy Evaluation Scale (AES-10)

Qualitative Analysis	
Theme 1: Juxtapositions around Knowledge of CADASIL	"Understand" CADASIL is a rare disease with no cure/treatment/limited knowledge, but all want to be able to get more information about how to treat/manage/what to expect. This indicates acknowledgement but not full acceptance of the reality
Theme 2: Management of CADASIL	Most patients focused on maintaining a healthy lifestyle (diet, exercise, mental health) and all appear to have searched to find options, referring to other research, support groups, etc. after being told that there are no treatments/cures
Theme 3: Fear/concern about the impact of the disease	Had more concern for family (children) than for themselves. Have an acute awareness of CADASIL's impact on their identity – loss of job, change in self, affecting family life, need to pace, take it easy, not take on too much, etc.

Disclosure of interest: No

540

SPONTANEOUS INTRACEREBRAL HEMORRHAGE IN YOUNG ADULTS: DATA FROM A STROKE CENTER IN VIETNAM

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Background and aims: Intracerebral hemorrhage (ICH) has recently become more prevalent in young adults but is still insufficiently studied. This study aimed to investigate the characteristics and outcomes of ICH in young adult patients.

Methods: Between November 2020 and October 2022, we prospectively enrolled a consecutive cohort of ICH patients aged 15-45 years admitted to the Stroke Center of Bach Mai Hospital to investigate risk factors, causes, and 90-day outcomes measured by the modified Rankin Scale (mRS).

Results: 207 patients (mean age: 33.8 ± 8.8; males: 70.1%) were enrolled. The most frequent risk factors were hypertension (36.7%), followed by heavy drinking (8.2%), and smoking (3,9%). The locations of ICH were basal ganglia/ internal capsule (39,1%), lobar (36.8%) and infratentorial area (9,9%). Specifically, hypertensive ICH (39.6%) and structural vasculopathy (e.g., arteriovenous malformation, cavernoma – 35.3%) were the most common causes, while cryptogenic ICH was considered in 14.5%. At the 90-day follow-up, 126 (59.4%) patients got favorable outcomes (mRS 0-2), and 61 (28.8%) patients died.

Conclusions: ICH in young adults has the most common locations in the basal ganglia/ internal capsule or lobar, and is often caused by

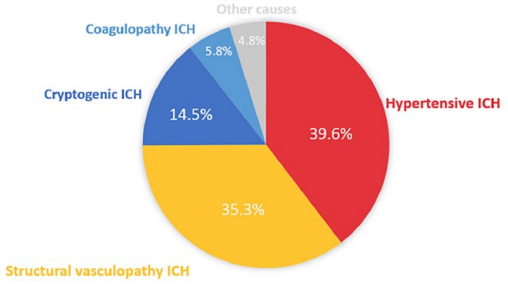

Figure 1. Distribution of Causes.

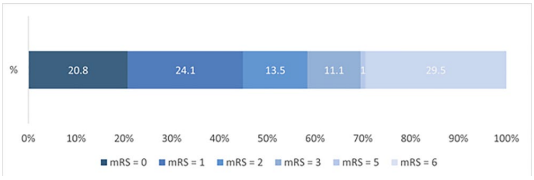

Figure 2. Distribution of mRS score at 90 days.

hypertension or structural vasculopathy, resulting in a high risk of dependence and 90-day mortality.
Disclosure of interest: No

564

Infective endocarditis and stroke - when does it bleed? A single center retrospective study

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Background and aims: Infective endocarditis (IE) is a serious condition with a high mortality and represents a rare cause of stroke. In this single center study, we characterized stroke patients with IE. In particular, we were interested in risk factors for intracranial hemorrhage and outcome of patients with intracranial hemorrhage compared to patients with ischemic stroke.
Methods: In this retrospectice study, patients with IE and symptomatic ischemic stroke or intracranial hemorrhage were included, who were admitted to our hospital between January 2019 until December 2022.
Results: 48 patients with IE and ischemic stroke or intracranial hemorrhage were included. 11 patients developed an intracranial hemorrhage, all within the first 12 days after admission. We identified S. aureus detection and thrombozytopenia as risk factors for hemorrhagic complications in these patients. An increased in-hospital mortality in patients with intracranial hemorrhage (64% vs. 22%) was found, whereas patients with ischemic stroke and patients with intracranial hemorrhage do not differ regarding good clinical outcome (mRS 0-2; 27% vs. 27%).
Conclusions: This single center study characterizes stroke patients with IE. Beside thrombocytopenia, we identified S. aureus detection as a major risk factors for intracranial hemorrhage and provide an outlook on how to proceed with cardiac surgery in these patients.
Disclosure of interest: No

905

Stroke associated with cancer: retrospective observational study among patients with ischemic stroke in a Stroke Unit

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Background and aims: The association between cancer and stroke is well known and leads to a worse prognosis for both pathologies. However, the prevalence of active cancer and occult cancer among stroke patients as well as the predictive factors of stroke in cancer patients, remain unclear. Its knowledge is important in order to diagnose early and improve the management of these patients.

Methods: The aim of this observational retrospective study is to analyze the prevalence of cancer among ischemic stroke patients admitted to a stroke unit for two years. A general descriptive and case-control analysis was performed to assess the differences between patients with active cancer and those without cancer.
Results: A sample of 616 patients with ischemic stroke was included. The prevalence of cancer in this population was 19.2% having the 7.5% an active cancer (diagnosed before or after the stroke). The presence of an active cancer was associated with: lesions in multiple vascular territories, lower hemoglobin and hematocrit values and higher fibrinogen and CRP values as well as a tendency to a worse functional outcome and higher mortality rated at three months.
Conclusions: A high prevalence of cancer, active or occult, was found among patients with ischemic stroke. Our results suggest that the existence of ischemic lesions in different territories and some laboratory markers could be predictive factors to suspect the presence of an occult neoplasm as the cause of stroke in some patients.

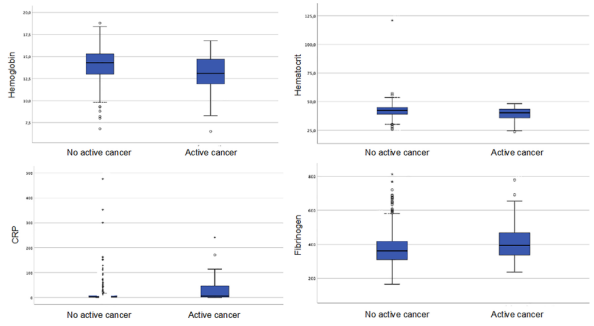

Figure 1.

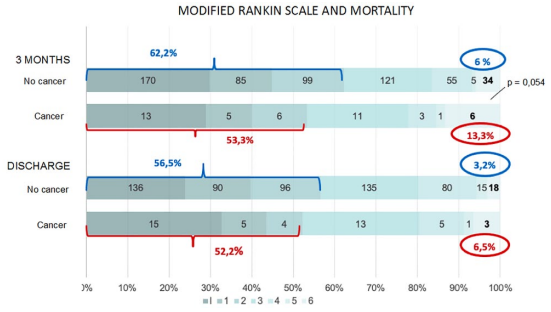

Figure 2.

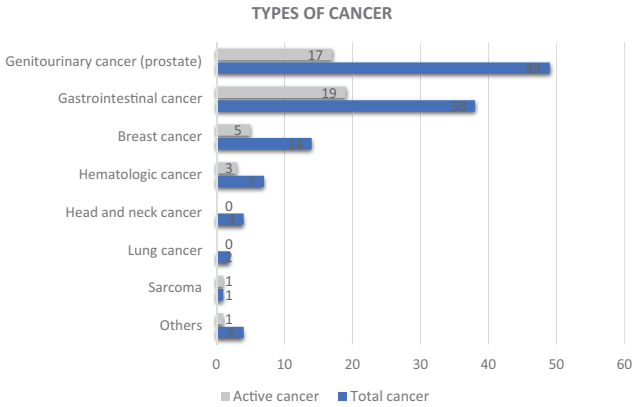

Figure 3.

Disclosure of interest: No

911

MoyaMoya case series: the need for referral centers

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Background and aims: MoyaMoya (MMV) vasculopathy is underdiagnosed and requires hyperspecialized neurovascular assessment.
Methods: This is a quasi-experimental study with time-series design. It was conducted at Seville (Spain) during 2021-2022. In 2022, an intervention about MMV was made: a protocol, training courses, and a multidisciplinary clinical commission with neurosurgery. The suspected cases of MMV were evaluated in a rare stroke outpatient clinic. Diagnosis criteria are verified with brain MRI or arteriography. Etiological studies were performed to verify a MMV disease or syndrome. The objective is to describe the potential impact of our intervention.
Results: In 2021, there were no cases of MMV. In 2022, 20 suspected cases were evaluated. Six MMV have been diagnosed. The median age at clinical onset was 33 years (one pediatric case), 50% being women. The race was Asian in one, American in another, and the rest Caucasian. All the patients presented ischemic stroke, except one who had a brain hemorrhage. Three cases were MoyaMoya syndromes (due to neurofibromatosis type 1, Noonan disease, and antiphospholipid syndrome). The mean diagnostic delay was 40 months. The median of Suzuki grade at the diagnosis was 4. The frequency of vascular involvement was: M1>TICA>A1. Indirect bypass was performed in three cases. Recurrence of the disease has only been detected in one case and direct bypass is pending.
Conclusions: The creation of MMV reference units may reduce the diagnostic delay and offer better management due to greater experience in a center with a high volume of patients.
Disclosure of interest: No

1175

Thrombotic Thrombocytopenic Purpura presenting as Code Stroke: a case series

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Background and aims: Thrombotic Thrombocytopenic Purpura (TTP) is a hemolytic microangiopathy due to the deficit of ADAMS-13. Clinical manifestations include systemic prodromes, fever, and neurological involvement in 50% of patients. While lethal without treatment, prognosis is good with prompt diagnosis and treatment. Hence, we aim to highlight the relevance of TTP diagnosis as a rare etiology presenting as Code Stroke.
Methods: Unicentric and retrospective case series of the Code Stroke patients with a final diagnosis of TTP between 2016-2022, the era of rituximab and caplacizumab.
Results: 5 patients were identified:
All received an early diagnosis based on a high suspicion and laboratory abnormalities. Aggressive treatment (plasma exchange, glucocorticoids and rituximab in all; plus caplazicumab in patients 1-4) was initiated in the first 24 hours, leading to an excellent prognosis in all. None received thrombolysis.
Conclusions: TTP is a rare but not-to-miss etiology of Code Stroke, as early treatment radically changes prognosis. Aphasia or mutism with certain perplexity was an especially characteristic presentation. Probably due to early treatment, all patients showed normal neuroimaging in our series.

1	2	3	4	5
37 year-old male	47 year-old female	42 year-old female	46 year-old male	83 year-old female
No relevant past record (NRPR)	NRPR	Pulmonary thromboembolism, fXII deficiency	NRPR	NRPR
Headache, confusion, aphasia, right hemianopia, right hemiparesis	Aphasia, right hemianopia	Subacute headache, fluctuating aphasia	Aphasia	Mutism, right gaze deviation, left hemiparesis (status epilepticus)
None had fever or renal failure				
Normal neuroimaging (brain CT, angioCT and MRI)				
Autoimmune etiology (positive anti-ADADMS-13 antibodies)				

Disclosure of interest: No

1603

EXTENSIVE CEREBRAL VENOUS THROMBOSIS RESULTING IN COMA WITHOUT FOCAL PARENCHYMAL LESIONS

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Background and aims: Coma secondary to cerebral venous thrombosis (CVT) is generally caused by focal lesions, bilateral thalamic oedema, or seizures. In rare cases, coma cannot be explained by any of these causes. We hypothesize that in these cases coma is caused by extensive thrombosis with obstruction of collateral drainage resulting in diffuse cerebral oedema.
Methods: Cases were collected through the International CVT Consortium. Selection criteria were confirmed CVT and coma not explained by focal lesions with mass effect, bilateral oedema of the basal ganglia or thalami, seizures, metabolic disturbances, or other medical conditions such as meningitis.
Results: Six cases were reported. All patients were female, median age was 30 (range 26-72). All patients presented with decreased consciousness (median Glasgow Coma Scale of 10 [range 7-14]). All patients had thrombosis in multiple sinuses, three had thrombosis of both the straight and superior sagittal sinus, and five had bilateral thrombosis of the transverse/sigmoid sinuses. Four patients had diffuse cerebral oedema on baseline CT. All patients had neurological deterioration resulting in coma within the first days of hospitalization. Three patients underwent endovascular treatment and the other three patients decompressive surgery. 4/6 patients died in hospital, the other two patients had mRS 2 and 5 at discharge. Both patients had completely recovered at last follow-up.

Conclusions: Patients with CVT and coma not explained by focal lesions or thalamic oedema often show extensive thrombosis and diffuse oedema on baseline imaging. These patients can deteriorate quickly and, despite aggressive treatment, in-hospital mortality rate is high.
Disclosure of interest: No

1870

Significance of isolated vertigo/dizziness and headache in intracranial vertebrobasilar artery dissections

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Background and aims: We aimed to evaluate clinical significance of isolated vertigo/dizziness and headache in intracranial vertebrobasilar artery dissection (iVBAD).
Methods: From a single-center (2002–2021), we identified acute iVBAD patients excluding subarachnoid hemorrhage (SAH). Presentation were trichotomized to focal deficits, isolated vertigo/dizziness (V), and isolated headache. Intra-arterial embolization, aneurysmal enlargement, or new SAH were considered hemorrhagic endpoints. Intra-arterial reperfusion, functional dependence, early neurological deterioration, or recurrent ischemic stroke were considered ischemic endpoints. Spontaneous arterial healing, aneurysmal enlargement, or new SAH were considered dynamic arterial changes. Clinical outcomes were compared among groups. The isolated vertigo group was further analyzed according to consistency with vascular vertigo/dizziness criteria.
Results: When patients with focal deficits (N=135), isolated V (N=45), and isolated headache (N=126) were compared, ischemic endpoints showed negative association with isolated V (adjusted odds ratio: 0.23, 95% confidence interval [0.06–0.83]) and isolated headache (aOR: 0.15, 95% CI [0.05–0.48]). While there were no differences in hemorrhagic endpoints, dynamic arterial changes were associated with isolated headache group (aOR: 2.31, 95% CI [1.10–4.84]) while less frequent in isolated V group (aOR: 0.41 [0.17–0.99]). In subgroup analysis, we failed to show association between clinical endpoints and fulfillment of the vascular vertigo/dizziness criteria.
Conclusions: Isolated V and headache is associated with a lower rate of ischemic endpoints. Isolated headache is associated with dynamic vascular changes. Causal ischemic association between iVBAD and isolated vertigo do not seem to be associated with differences in outcomes.

Table 1. Comparison of clinical, imaging characteristics and outcomes according to trichotomized presenting symptoms.

	Focal deficits (N=135)	Isolated vertigo (N=45)	Isolated headache (N=126)	P-value
Age	47 ± 12	52 ± 10	47 ± 9	0.010*
Sex, male	100 (74.1%)	34 (75.6%)	64 (50.8%)	<0.001
Morphology				<0.001
Steno-occlusion	90 (66.7%)	28 (62.2%)	33 (26.19%)	
Dilatation	45 (33.3%)	17 (37.8%)	93 (73.8%)	
Dissection location				0.002
VA	105 (77.8%)	42 (93.3%)	115 (91.3%)	
BA involvement	30 (22.2%)	3 (6.7%)	11 (8.7%)	
HTN	54 (40.0%)	16 (35.6%)	27 (21.4%)	0.005
DM	12 (8.9%)	8 (17.8%)	5 (4.0%)	0.014
Smoking	47 (34.8%)	16 (35.6%)	32 (25.4%)	0.202
Dyslipidemia	25 (18.5%)	7 (15.6%)	12 (9.5%)	0.114
DWI lesion	119 (88.1%)	24 (53.3%)	3 (2.4%)	<0.001
NIHSS	2.0 [1.0 – 4.0]	0.0 [0.0 – 1.0]	0.0 [0.0 – 0.0]	0.001†
Hemorrhagic endpoints	22/113 (19.5%)	5 /38 (13.2%)	25/104 (24.0%)	0.344
Acute embolic IA	17 (12.6%)	4 (8.9%)	16 (12.7%)	0.775
Delayed embolic IA	0 (0.0%)	0 (0.0%)	5 (4.0%)	0.013
Aneurysmal enlargement	9/115 (7.8%)	1/38 (2.6%)	11/103 (10.7%)	0.297
New SAH	1/126 (0.8%)	0/45 (0.0%)	2/117 (1.7%)	0.590
Ischemic endpoints	34/132 (25.8%)	3/45 (6.7%)	4/116 (3.4%)	<0.001
IA reperfusion	4/135 (3.0%)	0/45 (0.0%)	0/126 (0.0%)	0.077
END	18/119 (15.1%)	1/24 (4.2%)	0/3 (0.0%)	0.276
3m mRS 3-6	18/130 (13.8%)	0/45 (0.0%)	3/115 (2.6%)	<0.001
New ischemic stroke	8/126 (6.3%)	2/45 (4.4%)	1/117 (0.9%)	0.080
Dynamic arterial changes	64/103 (62.1%)	13/34 (38.2%)	76/93 (81.7%)	<0.001
Arterial healing	54/98 (55.1%)	13/34 (38.2%)	64/89 (71.9)	0.002
Aneurysmal enlargement	9/115 (7.8%)	1/38 (2.6%)	11/103 (10.7%)	0.297
New SAH	1/126 (0.8%)	0/45 (0.0%)	2/117 (1.7%)	0.590

*isolated vertigo vs. focal deficits, p=0.010, isolated vertigo vs. isolated headache, p=0.021, post hoc Bonferroni test.

† isolated vertigo vs. focal deficits, p=0.004, post hoc Bonferroni test.

VA, vertebral artery; BA, basilar artery; HTN, hypertension, DM, diabetes mellitus; DWI, diffusion weighted imaging; NIHSS, National Institute of Health Stroke Scale; IA, intra-arterial; END, early neurological deterioration; mRS, modified

Table 2. Multiple logistic regression analysis showing association between trichotomized presenting symptoms and ischemic endpoints.

	Odd ratio [95% CI]	P value
Presenting symptoms		
Focal deficits	Reference	
Isolated vertigo	0.23 [0.06 – 0.83]	0.025
Isolated headache	0.15 [0.05 – 0.48]	0.001
Age	1.04 [1.01 – 1.08]	0.021
Morphology		
Dilatation	Reference	
Steno-occlusion	1.45 [0.62 – 3.39]	0.39
Lesion location		
VA	Reference	
BA involvement	7.28 [3.04 – 17.42]	<0.001
Dyslipidemia	3.14 [1.30 – 7.55]	0.011

VA, vertebral artery; BA, basilar artery.

Table 3. Multiple logistic regression analysis showing association between trichotomized presenting symptoms and dynamic arterial changes.

	Odd ratio [95% CI]	P value
Presenting symptoms		
Focal deficits	Reference	
Isolated vertigo	0.41 [0.17 – 0.99]	0.047
Isolated headache	2.31 [1.1 – 4.84]	0.027
Age	0.94 [0.91 – 0.98]	<0.001
Morphology		
Dilatation	Reference	
Steno-occlusion	0.88 [0.45 – 1.72]	0.382
HTN	0.46 [0.24 – 0.89]	0.021

HTN, hypertension.

Disclosure of interest: No

2441

A RARE CASE OF UNBALANCED GENETIC TRANSLOCATION PRESENTING AS INCOMPLETE HANAC SYNDROME, SEIZURES AND LEARNING DISBILITY

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Background and aims: COL4A1/A2 genes encode type IV collagen, a key component of the basement membrane of vascular endothelium. Mutations of COL4A1/A2 genes result in multi-system disorders. The principal phenotype described in adults is HANAC syndrome (hereditary angiopathy with nephropathy, aneurysms and muscle cramps). More than 100 mutations have been described, half of which are inherited in an autosomal dominant pattern, the rest being de novo mutations.
Methods: A 40-year-old lady with a history of learning disabilities and seizures presented with accelerated decline in cognition and function in her 3rd decade of life. MRI brain and MR angiogram revealed extensive white matter changes, microhemorrhages and old lacunar infarcts consistent with cerebral microangiopathy, alongside three aneurysms involving the middle cerebral artery and its branches. Renal function and creatine kinase were normal.
Results: DNA microarray analysis identified a gain of 59 coding proteins in chromosome 13 involving the COL4A1 and COL4A2 genes (chromosome 13 duplication). A terminal deletion in the short arm of chromosome 8 was identified with an interstitial gain adjacent to the deletion (8p inverted duplication and deletion syndrome). Parental karyotyping proved this to be a de novo mutation.
Conclusions: We report a case of an unbalanced chromosomal translocation occurring de novo affecting the COL4A1/A2 genes resulting in incomplete HANAC syndrome. The co-existent chromosome 8 mutation led to the additional features of seizures and learning disabilities. To our knowledge, this particular genetic translocation between chromosomes 13 and 8 with this resultant clinical phenotype has not been reported before.
Disclosure of interest: No

2554

First clinical description of patogenic mutation c.2963G>T (p. Cys988Phe) in NOTCH3 gene

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Background and aims: Cerebral autosomal dominant arteriopathy with subcortical infarcts and leukoencephalopathy (CADASIL) is the most common hereditary cerebral small vessel disaese caused by *NOTCH3* gene mutation. To date, more than 200 *NOTCH3* mutations have been reported. In 2017, Mizuta et al. identified a new mutation - Cys988Phe. Until now its clinical description is lacking.
Aims: Clinical description of *c.2963G>T*, p.Cys988Phe variant in *NOTCH3* gene;18th exon.
Methods: Collection and evaluation of clinical data including demographic data, history, neurological examination and MRI imaging.
Results: We found six patients from one family with the mutation in heterozygous state (3 generations, heredity in the autosomal dominant manner). All were female; mean age was 56 years (34-84). 5/5 had abnormal white matter lesions (WML); in 3/5 WML involving the anterior temporal pole; in 3/5 WML extending to external capsule. The youngest patient (<35y) had no vascular risk factors and on MRI had WML, Fazekas I. 1/6 had mild cognitive impairment. Long tract signs or pseudobulbar symptoms were not found in any patient. None of them - including 84 years old patient - did suffer from migraine, stroke or stroke like episodes. 2/6 had mood disorder.
Conclusions: According to our clinical data, pathogenic mutation p.Cys988Phe shows mild CADASIL phenotype compared with common mutations in *NOTCH3* gene.
Disclosure of interest: No

2594

ASSESMENT OF AORTIC DISTENSIBILITY IN YOUNG STROKE PATIENTS WITH CERVICAL ARTERY DISSECTION

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Background and aims: A cohort study found that in patients with cervical arteries dissection (CAD) there was an approximately 4-fold increased risk of subsequent aortic dissection. This led to the hypothesizes that patients with CAD had a subclinical connective tissue disorder. Previous studies have shown decrease aortic distensibility in patients with connective tissue disorders.
We aimed to determine if individuals with young ischemic stroke caused by CAD had a decreased aortic distensibility that could be used as a marker of CAD
Methods: Consecutive sample of patients with ischemic stroke (< 50 years-old) admitted to two university hospitals from January 2019 to June 2022. We included patients with an undetermined stroke etiology after a complete investigations and patients with non-traumatic CAD. Stroke etiology was classified according to TOAST.

A 3 Tesla cardiac magnetic resonance was performed within the first month after stroke onset to determine aortic distensibility (systolic area-diastolic area/diastolic area) of the mid-ascending aorta using a phase contrast sequence. We compared aortic distensibility in the two groups of patients (undetermined vs CAD) using a non-parametric test.

Results: Sixty-one patients were included with a median age of 44.0 years (IQR 10). Sixty-five per cent were men. Nineteen patients had CAD (31.1%). There was no difference regarding aortic distensibility between patients with undetermined cause vs CAD (p=0.77).

Conclusions: In this exploratory study there was no evidence of decreased aortic distensibility in stroke patients with CAD compared to patients with an undetermined etiology

Disclosure of interest: No

CARDIOEMBOLISM AND HEART-BRAIN INTERACTIONS

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Propensity-Score Matched Analysis of Patent Foramen Ovale Closure in Real-World Study Cohort with Cryptogenic Ischemic Stroke

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Background and aims: Recent trials support patent foramen ovale (PFO) closure in selected patients with cryptogenic stroke. We examined the outcomes of percutaneous transcatheter PFO closure in a real-world study cohort with cryptogenic stroke.

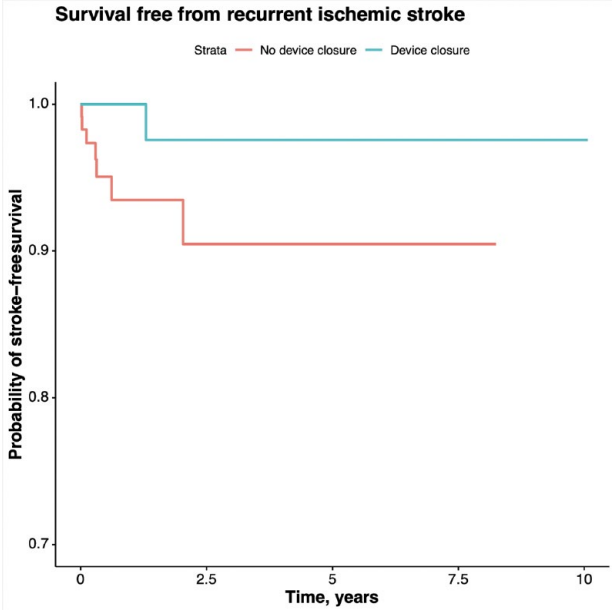

Figure 1. Kaplan-Meier-curve for survival-free from recurrent ischemic stroke in PFO patients with-or-without transcatheter device closure.

Methods: Consecutive ischemic stroke patients who were classified as cryptogenic aetiology and diagnosed with a PFO were included. All patients underwent either percutaneous PFO closure or medical therapy. A 2:1 propensity score matching by sex and Risk-of-Paradoxical-Embolism (RoPE) score was performed.

Results: Among 232 patients of mean age 44.3 (SD 10.8) years, 33.2% (n=77) were female, with a mean follow-up duration of 670 (SD 806) days. PFO closure (n=84) and medical therapy (n=148) groups were well-matched with <10% mean-difference in sex and RoPE score. There were no major periprocedural complications documented. The incidence of atrial fibrillation was similar between the closure and control groups (1.19% vs 1.36%, OR 0.90, 95%CI 0.04-9.79, P=0.94). Recurrent ischemic stroke event occurred in 2 patients in the closure group (2.4%) and 7 patients in the control group (4.7%). Multivariable Cox regression predicting time to recurrent stroke demonstrated a hazard-ratio of 0.18 (95%CI 0.02-1.51, P=0.12). The difference in restricted mean survival-time free from stroke at 2-years follow-up between treated and control was 34.7 days (95%CI 0.51-68.9, P=0.047).

Conclusions: In this cohort, transcatheter PFO closure is associated with minimal periprocedural complications. There was also a lower risk of stroke recurrence, but this did not reach statistical significance.

Disclosure of interest: No

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Novel Hybrid Cardiac and Aortic Arch 18fluoro-2-deoxy-d-glucose (18FDG) PET-CMR Protocol to Evaluate Potential Embolic Sources in Embolic Stroke of Undetermined Source Patients

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Background and aims: It is important to identify precise embolic sources in Embolic Stroke of Undetermined Source (ESUS) to target treatment. We hypothesised that a novel hybrid cardiac and aortic arch (AA) positron emission tomography magnetic resonance imaging (PET-MRI) protocol performed in a single setting is feasible to evaluate multiple potential embolic sources.

Methods: Eight ESUS patients were recruited with informed consent. Imaging was performed using a Siemens Biograph mMR 3T scanner (combined PET/MRI system). Gadovist was used with a 0.2 mmol/kg dose and the radio-tracer 18F-fluorodeoxyglucose (18F-FDG) was used with a standard dose. Majority of the scan was performed under expiration breath-hold with retrospective cardiac (ECG) gating. Imaging parameters included left atrial (LA) and left ventricle (LV) fibrosis quantification by late gadolinium-enhanced MRI through *ADAS® image post-processing software (Galgo Medical SL, Spain)*, 18F-FDG uptake in the AA and heart measured by the TBR_{max}.

Results: Of 8 ESUS patients (median age 55 years [IQR 52.75-58], 7 were male. In terms of comorbidities, 1 had a previous ischemic stroke, 6 had hypertension, 3 had diabetes mellitus, 4 had dyslipidemia and 3 had ischemic heart disease. All patients tolerated the hybrid imaging with no

complications. Imaging quality was acceptable and interpretable in all studies. Implementation of the hybrid protocol led to detection of 3 potential sources of ESUS: LA fibrosis (Figure 1), LV disease (Figure 2) and AA atherosclerosis (Figure 3).

Conclusions: In this study, we demonstrated that a cardiac and AA hybrid 18F-FDG PET-MRI was feasible to evaluate multiple embolic sources.

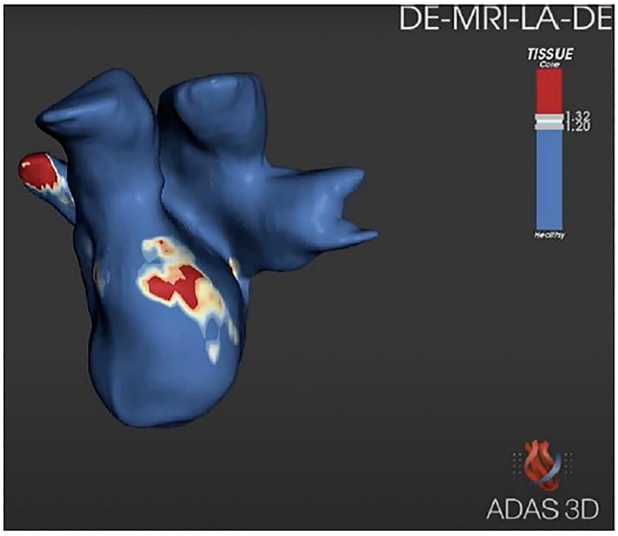

Figure 1: Left atrium shows area of fibrosis (red) and non-enhanced healthy tissue (blue)

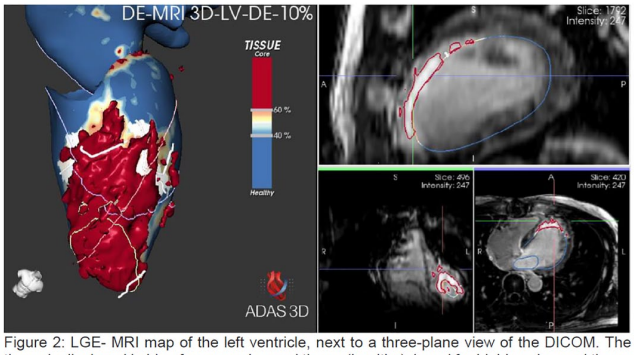

Figure 2: LGE- MRI map of the left ventricle, next to a three-plane view of the DICOM. The tissue is displayed in blue for non-enhanced tissue (healthy), in red for highly enhanced tissue (core), and from light blue to orange represents the grey-area tissue.

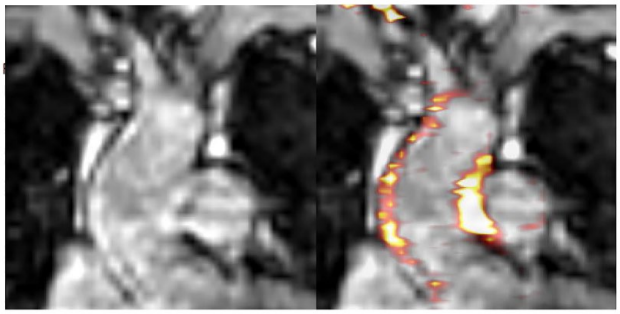

Figure 3: Aortic arch atherosclerosis and inflammation; high activity detected in ascending aorta TBRmax 2.18

Disclosure of interest: Yes

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CENTRAL ROLE OF THE NEUROLOGIST IN PERCUTANEOUS CLOSURE OF PATENT FORAMEN OVALE: EARLY DETECTION, APPROPRIATE INDICATION AND LONG-TERM FOLLOW-UP

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Background and aims: Patent foramen ovale (PFO) results from the failure of the septum primum and secundum to fuse after birth. With an incidence of 25% in adults, most are discovered incidentally but its presence has been linked to conditions such as migraine or stroke.

Percutaneous closure of the PFO is the therapeutic strategy that is gaining in ESUS momentum following the results of recent studies.

Echocardioscopy by the vascular neurologist allows early detection of PFOs and is becoming increasingly common practice.

This work places the neurologist at the centre of the process: from diagnostic imaging, appropriate indication in selected cases, active participation in the closure and long-term follow-up.

Methods: The neurologist performs echocardioscopy on all patients admitted to the stroke unit.

Patients in whom PFO is detected are presented to a multidisciplinary committee to complete the study and select cases.

Percutaneous closure is performed by a team consisting of the interventional neurologist and cardiologist.

Follow-up is performed by vascular neurology staff at 3, 6 and 12 months, including follow-up echocardioscopy.

Results: In the last year, we have detected more than 10 patients with PFO in our stroke unit, of which 9 have been closed. There have been no complications related to the intervention and no new ischaemic events in any of them.

Conclusions: Percutaneous PFO closure is the best therapeutic option for optimally selected patients. We believe that the role of the vascular and interventional neurologist is essential in the selection, treatment and follow-up of these patients.

Disclosure of interest: No

1440

AUTOMATED ALBERTA STROKE PROGRAM EARLY CT SCORE IN STROKE-RELATED MYOCARDIAL INJURY

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Background and aims: Myocardial injury can be frequently observed in patients with acute ischemic stroke. It has been hypothesized that stroke lesion location within the central autonomic network might precipitate myocardial injury. However, neuroimaging studies offer conflicting results,

and the neuroanatomical basis of stroke-related myocardial injury is not yet fully understood. In this study, we aim to identify if early ischemic changes within the territory of the middle cerebral artery are associated with myocardial injury in acute ischemic stroke patients.

Methods: We studied 171 patients with acute anterior circulation ischemic stroke admitted to our department between August 2020 and August 2022. Patients were assessed for myocardial injury by serial troponin sampling. Baseline CT scans were evaluated for ischemic changes in ten regions (M1, M2, M3, M4, M5, M6, lentiform, insula, caudate, internal capsule) by automated Alberta Stroke Program Early CT Score (ASPECTS) using Brainomix e-Stroke software.

Results: 171 patients were included in the study. Fifty of them (29 %) developed myocardial injury. No difference was found in overall ASPECTS score values between patients with and without myocardial injury (mean ASPECTS score 9,2 in booth groups). No association was observed for specific region involvement and myocardial injury. Patients who developed myocardial injury were older (mean age 76,6 versus 69,4) and presented with more severe strokes (mean NIHSS 12,4 vs 9,1).

Conclusions: Myocardial injury in acute ischemic stroke patients is not associated with automated Alberta Stroke Program Early CT Score.

Disclosure of interest: No

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FAST Index: a new score combining clinical, radiological, anatomical features to diagnose PFO-related stroke

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Background and aims: Patent foramen ovale (PFO) closure was shown to be superior to medical therapy alone for the secondary prevention of PFO-related ischemic stroke, mainly in case of at-risk PFO anatomy. Diagnosis a PFO-related stroke is challenging. The Rope score was proposed as a helping tool but it does not consider anatomical PFO features. We aimed to propose a new, more extensive, index

Methods: We created the FAST-index (**PFO-A** ttributable risk of **ST**roke) combining clinical-neuroradiological-PFO anatomical features that according to literature seemed to raise the chance for a PFO to be pathogenetic (figure 1). The index was applied to a series of stroke/TIA patients with PFO for whom a Heart&Brain Team had given, according to the latest PFO position paper, an indication to PFO-closure or not (i.e. PFO-related stroke or not). A comparison (ROC curve) of the predictive power of FAST-index and Rope-score as to the identification of the 2 groups was performed.

Results: Three-hundred-thirty-four patients were evaluated by the Heart&Brain team, 208 classified as PFO-related, 106 not. The FAST index turned out to be better than Rope score to distinguish between PFO-related stroke or not (Area Under Curve: 0.812 vs 0.765) and it was even better taking median age into account (Figure 2,3). A FAST-index-score >10 was able to identify around 70% of pathogenetic PFO.

Conclusions: Our study, although deserving confirmation, suggests that the FAST-index, combining clinical-neuroradiological and anatomical PFO characteristics, could be of help to identify stroke patients warranting PFO closure.

FAST index

PARAMETERS	POINTS
Age (years)	
< 30	5
30-39	4
40-50	3
51-60	2
61-70	1
>70	0
No history of hypertension	1
No history of diabetes	1
No history of stroke or TIA	1
Non-smoker	1
Cortical infarct on imaging	1
Posterior infarct on imaging	1
Right-left shunt	
Permanent	2
Latent	1
Right-left shunt degree	
Severe	3
Moderate	2
Mild	1
Interatrial septal aneurysm	1
Interatrial septal aneurysm entity	
> 15 mm	2
< 15 mm	1
Associated anatomical features (Eustachian valve, Chiari's network)	1

Figure 2: comparison (ROC curve) of the predictive power of FAST-index and Rope-score as to the identification of PFO related stroke

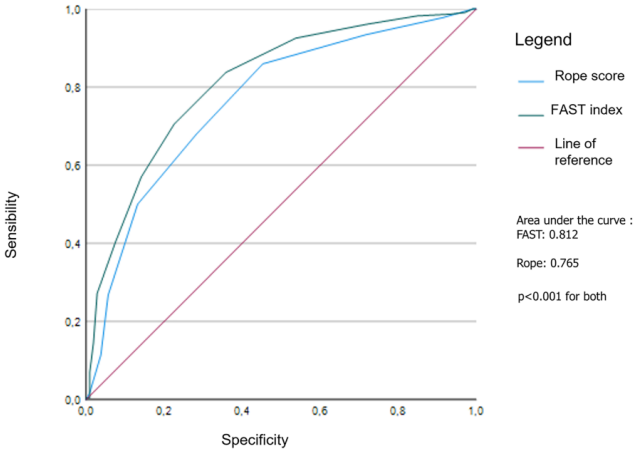
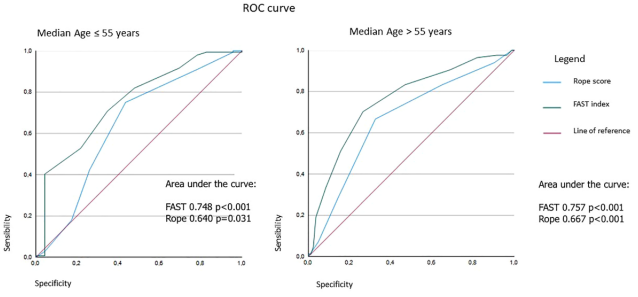


Figure 3: comparison (ROC curve) of the predictive power of FAST-index and Rope-score as to the identification of PFO related stroke according to median age



Disclosure of interest: No

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DETECTION OF ATRIAL FIBRILLATION BY LONG-TERM CARDIAC MONITORING AFTER EMBOLIC STROKE OF UNDETERMINED SOURCE (ESUS)

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Background and aims: Embolic stroke of undetermined source (ESUS) is diagnosed in up to 30% of strokes. Atrial fibrillation (AF) detection in ESUS results in change, from antiplatelet therapy to oral anticoagulation. Recommendations on intensity of diagnostic efforts for AF-detection are missing.
Methods: We developed a systematic management algorithm for ESUS patients. Eligible patients are prospectively enrolled into a registry and equipped with an insertable cardiac monitor (ICM). We used the Medtronic Reveal Linq ICM® and Medtronic Care Link® home monitoring systems.
Results: From January to December 2018, we enrolled 143 ESUS patients, of which 88 (61.5%) received ICM. All patients received 72h cardiac monitoring prior to ICM implantation and n=82 were enrolled into home monitoring. AF was diagnosed in eight patients (9.7%). The mean duration until AF-detection was 117 days. Episodes were assessed on site and via home monitoring system, by means of contacting patients if episodes were recorded. We received regular transmissions every six weeks from 47 patients (57.3%). Overall, we adjudicated 5220 episodes from 82 ICMs (median 5 episodes/patient). There were 638 (12.2%) AF-alarms, of which 410 occurred after correct AF-detection. Patients diagnosed with AF had 39 incorrect alarms preceding diagnosis (median 0.5/patient). 189 incorrect AF-alarms occurred in patients without AF.
Conclusions: ICM combined with systematic home monitoring is a potent tool to detect AF in ESUS patients. However, our analysis demonstrates that relevant effort is required to maintain timely adjudication of events for the patients benefit. Optimized automated event classification and careful patient selection appear warranted.
Disclosure of interest: No

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TROPONIN LEVEL DIFFERENCES IN STROKES WITH AND WITHOUT TREATMENT

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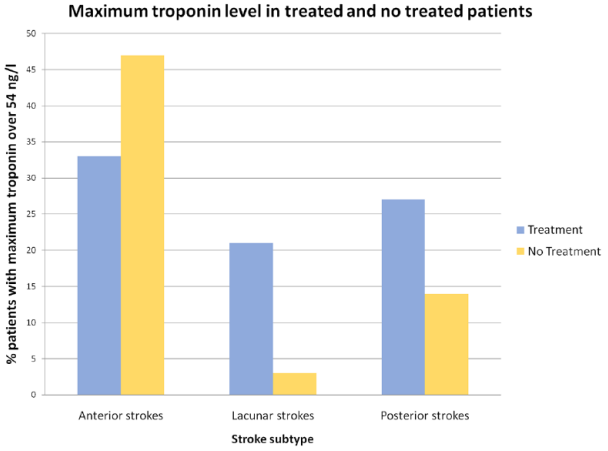
Background and aims: Recently the Stroke-heart syndrome (SHS) has been defined as a complication of acute stroke. It consists in the cardiac injury following an acute stroke. The main hypothesis of the cause is the cytokines storm involving the sympathetic system. There are few studies which explore differences between treated strokes and no treated ones. In this work we try to find any difference in troponin level reached between treated patients and no treated looking at the OCSP classification.
Methods: We collect retrospectively 344 patients admitted in the stroke unit (SU) of Trieste in 2022, collecting data on clinical characteristics, site of stroke sec OCSP and maximum troponin level reached and if it is higher than the 99th percentile of our standard laboratory test troponin level (18 ng/l).
Results: Comparing the effects in each OCSP subgroup, we find statistical differences between the treated and no treated patients in all groups except for the posterior strokes. In particular the treatment effect on the anterior strokes group (TACI+PACI) induced only 33% of patients (vs 47% if no treated) with values of troponin over 54 ng/l, however in the lacunar strokes the treatment seems to increase the troponin level (21% vs 3% have a value over 54 ng/l).
Conclusions: Cardiac involvement after stroke has a complex physiopathology, the treatment effects on this pathological entity seems to be more effective in anterior circulation strokes rather than the lacunar and the posterior ones.

Table 1: Troponin levels over 99th percentile (18ng/l) and 3 times 99th percentile (54ng/l) in stroke subtypes. Each stroke subtype is divided between Treated (T) and non treated (n-T) patients. Significant differences are in bold (p<0.05)

	Anterior strokes (TACI + PACI)		Lacunar strokes (LACI)		Posterior Strokes (POCI)	
	T (n=133)	n-T (n=78)	T (n=38)	n-T (n=59)	T (n=22)	n-T (n=14)
Maximum troponin level > 99° percentile (18 ng/l) [n (%)]	75 (55%)	46 (59%)	**12 (32%)**	**6 (10%)**	8 (36%)	4 (29%)
Maximum troponin level > 3 times the 99° percentile (54 ng/l) [n (%)]	**44 (33%)**	**37 (47%)**	**8 (21%)**	**2 (3%)**	6 (27%)	2 (14%)



Disclosure of interest: No

INTRACEREBRAL HAEMORRHAGE

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INFLUENCE OF TYPE OF HOSPITAL ON THE OUTCOME OF PATIENTS WITH ACUTE INTRACEREBRAL HEMORRHAGE: A POPULATION-BASED STUDY

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Background and aims: It is uncertain whether the type of hospital to which patients with intracerebral hemorrhage (ICH) are admitted is associated with outcome. We hypothesized that first admission to a Comprehensive Stroke Centre (CSC) would be associated to a better outcome compared to a non-CSC centre.
Methods: A population-based study of all spontaneous ICH consecutive patients (March 2020 to February 2022), admitted to hospitals in Catalonia (Spain). We excluded patients with >24 hours from stroke onset to admission and those with a previous modified Rankin scale score (mRS)>3. Hospital type was classified as CSC or non-CSC. We recorded demographic, clinical and radiological data. Functional outcome was determined by shift mRS analysis at 3 months using ordinal logistic regression. Mortality was assessed by logistic regression.
Results: We studied 1694 patients (age 69.7±14.2 y, 62.0% men); 1376 (81.2%) patients were admitted to a CSC, and 318 (18.8%) to a non-CSC center. Median (IQR) time to admission was 5 (2-9) hours, NIHSS score was 12 (5-20) and volume was 17 (6-45) ml. Results were adjusted for age, NIHSS score, baseline volume and withdrawal of care within 24h. Shift analysis did not show significant differences in the distribution of mRS between patients admitted initially to a CSC vs. non-CSC (aOR 1.09, 95% CI 0.87-1.35). We neither found significant differences regarding mortality (aOR 0.96, 95% CI 0.74-1.23).
Conclusions: Initial admission to a CSC had no influence on the outcome of patients with acute spontaneous ICH. Further studies considering secondary transfers to CSC are warranted.
Disclosure of interest: No

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RATIONALE FOR AGGRESSIVE ACUTE TREATMENT AND SUSTAINED REHABILITATION IN PATIENTS WITH INTRACEREBRAL HAEMORRHAGE (ICH)

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Background and aims: Although the rate of functional recovery seems to be highest in the first 30 days post-ICH, in many patients the recovery continues albeit slowly for 6-12 months. Modified Rankin Scale (mRS) scores of 0-3 & 4-6 respectively denote good & poor functional outcomes.
Methods: A comprehensive search of PubMed & EMBASE from March 2020 to December 2022 was made using 3 search items: intracerebral haemorrhage, functional improvement, predictors of poor outcome. The search items were combined using the Boolean operator.
Results: In a post-hoc analysis of ~1000 patients with intracerebral or intraventricular haemorrhage across two clinical trials, 72% patients demonstrated poor functional outcome at 30 days. The functional improvement nonetheless continued slowly, & by one year, 46% patients managed to achieved good functional outcomes, including 30% who became functionally independent. Predictors of poor one-year outcomes included older age, imaging findings of large ICH volume, intraventricular haemorrhage/extension, specific ICH locations (brainstem, thalamus, or posterior limb of internal capsule), severe concurrent leukoaraiosis, recurrent ICH, underlying diabetes mellitus, & development of acute ICH complications (e.g. new ischemic stroke, sepsis, prolonged mechanical ventilation, hydrocephalus, and the need for a gastrostomy feeding tube).
Conclusions: Growing evidence seems to support the practice of instituting aggressive acute medical management in patients with ICH to help avoid acute ICH complications. Early rehabilitation & sustained support including educating patients & caregivers regarding secondary prevention strategies & addressing lifestyle changes also seems to be of prognostic benefit.
Disclosure of interest: No

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Diagnostic Utility of Brain MRI in Patients with Spontaneous Intracerebral Hemorrhage: A Retrospective Cohort Study and Meta-Analysis

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Background and aims: The diagnostic yield of brain Magnetic Resonance Imaging (MRI) in spontaneous intracerebral hemorrhage (ICH) is unclear. We performed both an independent single-center retrospective cohort study and a meta-analysis to assess the detection rate of secondary lesions on MRI in patients with spontaneous ICH.
Methods: In the retrospect cohort study, we examined a cohort of 856 consecutive patients with spontaneous ICH. Brain MRI scans on admission and follow-up were assessed for secondary lesions. We also examined clinical and CT radiographic variables associated with secondary lesions in univariable analyses. In the meta-analysis we searched PubMed for articles investigating the diagnostic yield of brain MRI in spontaneous ICH and pooled the detection rates of secondary lesions on MRI.
Results: Of the 856 ICH patients in our cohort; 186 died during hospitalization. Among the 670 survivors [70±15 years, 379(57% male)], 430(64%) had an admission MRI and 136(20%) had both admission and follow-up MRIs. 30/430(5.6%) of admission MRIs revealed a secondary lesion. 4/127(3.1%) patients with a negative admission MRI had a lesion identified on follow-up MRI. No clinical or radiographic variables were associated with a secondary lesion on MRI. The meta-analysis included 4 studies identified in the PubMed search and our cohort study comprising 1115 patients with spontaneous ICH who underwent brain MRI. The mean detection rate of secondary lesions was 11% (95%CI: 8-15%).

Conclusions: No predictors of secondary lesion detection were identified in our cohort study. Prospective studies are required to better understand the diagnostic utility of MRI in spontaneous ICH.
Disclosure of interest: No

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THE ASSOCIATION BETWEEN PERIHAEMATOMAL OEDEMA AND FUNCTIONAL OUTCOME AFTER SPONTANEOUS INTRACEREBRAL HAEMORRHAGE: A SYSTEMATIC REVIEW AND META-ANALYSIS

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Background and aims: Perihaematomal oedema (PHO) formation has gained increasing interest as a therapeutic target after spontaneous intracerebral haemorrhage (ICH). Whether PHO contributes to poor outcome is unclear. We aimed to determine the association between PHO and outcome in patients with spontaneous ICH.
Methods: We searched five databases up to 17 November 2021 for studies of ⩾10 adults with ICH reporting the presence of PHO and outcome. We assessed risk of bias, extracted aggregate data and used random effects meta-analysis to pool studies that reported odds ratios (OR) with 95% confidence intervals (CI). Primary outcome was poor functional outcome defined as modified Rankin Scale score of 3-6 at three months. Additionally, we assessed PHO growth and on poor outcome at any time of follow-up. We prospectively registered the protocol in PROSPERO (CRD42020157088).
Results: We identified 12,968 articles, of which we included 27 studies (n=9,534). Eighteen studies reported an association between larger PHO volume and poor outcome, six a neutral result and three an inverse relationship. Larger absolute PHO volume was associated with poor functional outcome at three months (OR per ml increase of absolute PHO 1.03, 95% CI 1.00-1.06, I2 44%, four studies). Additionally, PHO growth was associated with poor outcome (OR 1.04, 95% CI 1.02-1.06, I2 0%, seven studies).
Conclusions: In patients with spontaneous ICH, larger PHO volume is associated with poor functional outcome at 3 months. These findings support the development and investigation of new therapeutic interventions targeting PHO formation to improve outcome after ICH.
Disclosure of interest: No

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EFFECT OF HYDRATION STATUS ON MORTALITY AND FUNCTIONAL OUTCOME IN PATIENTS WITH SPONTANEOUS INTRACEREBRAL HAEMORRHAGE

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Background and aims: Dehydration is related to increased morbimortality in patients with ischaemic stroke. Little is known about the effect in patients with intracerebral haemorrhage (ICH). The aim was to determine the association of dehydration with mortality, functional outcome and haematoma growth. Dehydration was hypothesized to lead to higher mortality and worse functional outcome.
Methods: Observational, retrospective, single-centre study. Patients with spontaneous ICH (July 2013-December 2021) were included, excluding those undergoing neurosurgical evacuation. Dehydration was defined as plasma osmolality ⩾295mmol/L at baseline blood test. Demographic, clinical and radiological variables were collected.
Primary end-point was mortality during hospitalization. Secondary endpoints were haematoma growth (in follow-up CT scan⩽72h, defined as absolute increase ⩾6ml and/or relative increase ⩾33%) and functional outcome assessed with 3 month-modified Rankin Scale (poor outcome defined as mRS=3-6).
Multivariable analyses (adjusted for age, NIHSS, ICH volume and intraventricular haemorrhage) were performed to assess whether dehydration was independently associated with in-hospital mortality, haematoma growth and functional outcome.
Results: A total of 665 patients [mean age 72.9 years (SD15), 313(47.1%) women] were included. Dehydration was detected in 390 (58.6%) and was associated with higher age, NIHSS and ICH volume. Dehydration was

independently associated with higher in-hospital mortality (adjusted OR:1.61[95%CI:1.01-2.61]). Bivariate analysis showed worse functional outcome in dehydrated patients (74.5% vs. 65.5%,p=0.030), but, after multivariable analyses, no independent association with haematoma growth or functional outcome was found.
Conclusions: Dehydration is observed in more than half of the patients with ICH and is associated with higher in-hospital mortality.
Disclosure of interest: No

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Retrospective Study of Intracerebral Haemorrhage Outcome in Patients on Direct Oral Anticoagulants

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Background and aims: Theoretically, patients taking direct oral anticoagulants (DOACs) may be at increased risk of poor outcome should they suffer ICH. To test this hypothesis, we studied the outcomes of those presenting with ICH to St George's Hospital, London in a calendar year.
Methods: This was a retrospective study, using audit data of adult ICH patients presenting from 01/01/2021 to 31/12/2021. Primary ICH was defined as spontaneous ICH in the absence of any underlying vascular malformations, space occupying lesions or coagulopathy.
Data included demographic details, admission medication, modified Rankin Scale (mRS), NIHSS, risk factors, size and site of ICH. Outcome was discharge mRS.
Results: The study included 139 patients of which 22 were on DOACs and 117 were not. The latter comprised the control group. DOAC patients were significantly older (79.4±6.7 v 71.8±13.7, $p<0.05$, ANOVA), had significantly worse admission mRS (median 2 IQR 1-3 v median 1 IQR 0-3, p=0.03, Mann-Whitney U), with significantly more risk factors (3.0±1.1 v 1.6±1.2, $p<0.001$, ANOVA), and medication (2.4±0.7 v 0.9±0.9, $p<0.001$, ANOVA). In particular, they had more previous stroke/TIA and AF. However, admission NIHSS, size distribution of ICH, and discharge mRS were not significantly different. One patient on a DOAC had cerebral amyloid angiopathy (CAA) compared to 16 controls.
Conclusions: DOAC patients were significantly more disabled at presentation. Our data ascribes this to greater comorbidity, including previous stroke/TIA. However, contrary to the hypothesis, DOACs did not further adversely affect outcome. The low use of DOACs in CAA suggests appropriate prescribing caution.
Disclosure of interest: No

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INFLUENCE OF DIABETES MELLITUS ON WHITE MATTER INJURY IN AN EXPERIMENTAL MODEL OF INTRACEREBRAL HEMORRHAGE

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Background and aims: The role of Diabetes Mellitus (DM) in damage after intracerebral hemorrhage (ICH) has been barely studied. We aimed to explore the impact of DM on white matter injury in an ICH experimental model.
Methods: Male and female Sprague-Dawley rats were studied. DM type 2 was induced by intraperitoneal injection of nicotinamide-streptozotocin 2 weeks prior to HIC induction. Animals with maintained blood glucose>250mg/dL were considered diabetic. ICH was induced by stereotactic injection with collagenase-IV in the striatum. Non-diabetic(n=11) and diabetic-ICH(n=11) animals were compared. Diabetic animals without ICH were studied as controls(n=10). ICH volume was measured by Magnetic Resonance Imaging (MRI) at 48h. Fiber density was evaluated by fractional anisotropy (FA)-MRI at 48h and 1 month. Myelin damage was studied by MOG and Olig-2 immunofluorescence and by CryoMyelin histochemistry at 1 month.
Results: The diabetic-ICH group developed smaller ICH (13.42 mm3 ± 23.13 vs 43.44 mm3 ± 15.08, p=0.014). FA-MRI values at 48h were similar in both groups (0.53 ± 0.19 vs 0.54 ± 0.13, p=0.970). However, diabetic-ICH animals showed higher values at 1 month (0.86 ± 0.45 vs 0.42 ± 0.13, p=0.002) and higher expression of MOG (45.08 A.U. ± 13.15 vs 25.02 A.U. ± 6.42, p=0.001) and Olig-2 (7.79 A.U. ± 2.17 vs 4.75 A.U. ± 2.29, p=0.001). CryoMyelin showed no differences between both groups (88.30 A.U. ± 13.78 vs 83.44 A.U. ± 9.31, p=0.288).
Conclusions: DM is not related to more severe acute damage. In addition, greater expression of biomarkers of white matter integrity was found.
Disclosure of interest: No

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O2L-001, AN EXTENDED-RELEASE FORMULATION OF AN OPTIMIZED TISSUE-TYPE PLASMINOGEN ACTIVATOR FOR AN EFFECTIVE AND SAFE THROMBOLYSIS OF INTRACEREBRAL HAEMATOMA

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Background and aims: Intracerebral haemorrhage (ICH) is an unmet medical need leading to the formation of an intracerebral haematoma. Updated guidelines for the management of ICH patients recognize that minimally invasive approaches for evacuation of hematoma open a new area for treatment. Here we demonstrate that O2L-001 allowing the extended-release of a new rtPA variant named OptPA, offers an improved efficacy for haematoma evacuation as well as the best safety.
Methods: OptPA was produced in CHO cell line before purification, nanoprecipitation using the NANOp2Lysis® technological platform followed by suspension in a solution of 17% poloxamer 407 to obtain O2L-001. *Ex vivo* hematoma models using human blood were used to show O2L-001 thrombolysis properties and efficacy.
Results: Although OptPA has the same thrombolytic activity than rtPA, OptPA has less capacity to activate plasminogen into plasmin in the absence of fibrin, reducing potential bleeding events. We demonstrate that long term exposure to thrombolytic agent were essential to achieve high thrombolysis efficacy. This discovery led to the development of O2L-001 allowing the extended release of OptPA in the first 6h of treatment. Interestingly, unlike rtPA, O2L-001 is able to induce the complete lyse of 5ml hematoma. On clinical size hematomas (obtain from 30 ml of human blood), a single injection of O2L-001 at 1mg/ml into the core of the hema-

toma led to an increase of thrombolysis of 44% when compared to rtPA.
Conclusions: O2L-001 is an interest candidate for ICH treatment and clinical size hematoma is relevant to move toward a First-in-Patient trial.
Disclosure of interest: No

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Intracerebral haemorrhage: improvements in acute workflow times over the past decade

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Background and aims: In patients with intracerebral haemorrhage (ICH), haematoma enlargement occurs most often within the first hours after symptom onset. With new treatment options for ICH becoming available, ICH patients may profit from the fast-expanding acute treatment options in ischemic stroke, which have led to substantial improvements in emergency stroke chains. We aimed to investigate whether pre- and in-hospital workflow has improved over the past decade and which proportion of ICH patients arrives early in the hospital.
Methods: In this single-center retrospective study, we investigated consecutive patients with ICH admitted in the acute phase (<48h) in 2006-2009 (cohort 1, n=234) and 2016-2019 (cohort 2, n=206). We compared onset or last-seen-well (LSW)-to-door time, door-to-CT scan time, and the proportion of patients with onset/LSW-to-scan time within 6 hours.
Results: Median age was 73.9 (IQR 17.6) in cohort 1 and 76.0 (IQR 19.2) years in cohort 2; 55.1 vs 52.9% male. Median onset/LSW-to-door time was 185 (IQR 533) minutes in cohort 1 vs. 169 (IQR 621) minutes in cohort 2 (p=0.33). Median door-to-scan time was 18 minutes shorter in cohort 2 (36 (IQR 59) vs. 18 (IQR 28) minutes; p=<0.001). In cohort 2, 64.6% of patients was scanned within 6 hours after onset/LSW compared to 59.0% in cohort 1 (p=0.23).
Conclusions: Patients with ICH have profited from improvements in emergency stroke chains, especially with reduction of in-hospital workflow. However, there is still room for improvements to reduce pre-hospital delays and to increase the number of patients eligible for upcoming new ICH treatments.
Disclosure of interest: Yes

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IR-CPI REDUCES BRAIN INFILTRATION OF NEUTROPHILS RELEASING EXTRACELLULAR TRAPS AND ATTENUATES NEURONAL DEGENERATION AFTER INTRACEREBRAL HAEMORRHAGE

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Background and aims: A major contributor to poor outcomes after intracerebral haemorrhage (ICH) is secondary brain injury that notably involves neuroinflammation with early activation of microglia, release of proinflammatory mediators and infiltration of inflammatory cells including neutrophils. Experimental ICH models showed that neutrophils damage the brain by producing reactive oxygen species, releasing proinflammatory proteases and neutrophil extracellular traps (NETs), affecting blood brain barrier permeability and worsening neuronal death.
In a murine model, we evaluated *Ixodes ricinus*-Contact Phase Inhibitor (Ir-CPI), an inhibitor of neutrophil-mediated thromboinflammation, on evolution of perihematomal oedema (PHO) and haemorrhage volumes, on neutrophil infiltration and neuronal degeneration.
Methods: ICH was induced by injection of bacterial collagenase into the right striatum. Mice were allocated either to PBS, Ir-CPI or enoxaparin (n = [6-8]). Treatments were administered intravenously immediately post-stroke induction as a bolus followed by a 3-day infusion.
Results: Ir-CPI did not increase PHO and haemorrhage volumes measured by magnetic resonance imaging 1 and 3 days after ICH, as compared to PBS. Ir-CPI decreased neutrophil infiltration and significantly decreased the number of neutrophil-releasing NETs at collagenase injection site ($p < 0.05$). Ir-CPI also reduced the number of degenerating neurons in the haemorrhagic zone ($p < 0.05$ at the injection site). In contrast, enoxaparin increased oedema and haemorrhage volumes as compared to Ir-CPI ($p < 0.05$) and PBS and had no significant impact on neutrophil infiltration and on degenerating neurons.
Conclusions: Administration of Ir-CPI in mice post-ICH induction is safe, reduces neutrophil infiltration including neutrophil-releasing NETs, and attenuates neuronal degeneration.
Disclosure of interest: No

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OUTCOME OF DECOMPRESSIVE HEMICRANIECTOMY WITHOUT EVACUATION OF HEMATOMA IN SUPRATENTORIAL INTRACEREBRAL HEMORRHAGE IN A TERTIARY GOVERNMENT HOSPITAL IN THE PHILIPPINES: A RETROSPECTIVE STUDY

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Background and aims: Decompressive hemicraniectomy (DC) is well-established in ischemic stroke. It is important in the management of increased intracranial pressure thus improving clinical outcomes. DC and its application to intracerebral hemorrhage (ICH) without the evacuation of hematoma remains to be unclear. This study aims to determine the outcome of Supratentorial Intracerebral Hemorrhage based on NIHSS Score and MRS who underwent decompressive hemicraniectomy (DC) without evacuation of hematoma.
Methods: This is a tertiary hospital-based, observational, review of records that used probability sampling design and enrolled 65 patients who were admitted in the Neuroscience department from January 2017-August 2022.
Results: We analyzed the clinical, radiological, and the surgical (inclusion time to DC whether it is less than 24 hours, 24-48 hours, or beyond 48 hours) characteristics. Of all the 59 patients with ICH score <3, 28 had mRS <3, none died. All of them had mild to moderate stroke based on NIHSS. Among 6 patients with ICH score 3 and NIHSS > 18, all patients died. All patients with ICH score 4 and 5 and NIHSS > 25 also died. The *P* value of mRS for ICH score and NIHSS is <0.0001 which is statistically highly significant. The increase in ICH score and NIHSS was associated with poor clinical outcome in the present study.
Conclusions: Decompressive hemicraniectomy without evacuation of hematoma does help in clots in certain locations and of a particular volume and when done at an optimal time, and is reserved for patients with large hematomas.
Disclosure of interest: No

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INTERLEUKIN-4 IS A POTENTIAL PREDICTOR OF OUTCOME IN ACUTE PRIMARY INTRACEREBRAL HEMORRHAGE

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Background and aims: M2 microglia phenotype, induced by interleukin-4 (IL-4), play a major role in ischemic stroke. IL-4 induces M2 microglia polarization associated with neuroprotective extracellular matrix composition changes and tissue recovery. Interleukin-10 (IL-10) promotes neuronal and glial cell survival during human brain injury. The goal of this pilot study was to investigate the role of IL-4 and IL-10 in primary intracerebral hemorrhage (ICH).
Methods: In 24 acute ICH patients, IL-4 and IL-10 concentrations were assessed using a multiplex immunoassay on the 1st and 14th days of the disease. 21-day outcome data was collected from medical records. The study was approved by the Local Ethics Committee.
Results: IL-4 and IL-10 concentrations were elevated compared to their normal range, indicative of IL-4 and IL-10 expression and microglial transition to M2 phenotype. There was a correlation between IL-4 and IL-10 concentrations on the 1st ($r=0.803$, $p<0.001$) and the 14th ($r=0.709$, $p=0.015$) days of disease. In univariate model, high IL-4 concentration at admission was predictive of in-hospital death [OR 1.06 per 1 pg/mL of IL-4, 95% CI 1.027–1.417, $p=0.023$]. In addition, there was a non-significant trend towards elevated IL-10 at admission in non-survivors notwithstanding its potential neuroprotective role (45.11 ± 39.59 vs. 71.78 ± 26.16 pg/ml, $p>0.05$).
Conclusions: IL-4 and IL-10 hyperexpression were most likely caused by the extent of the brain damage. Elevated IL-4 could be a potential predictor of 21-day death in primary ICH. Despite the potential neuroprotective role, IL-4 and IL-10 expression alone is insufficient to ameliorate brain damage in ICH.
Disclosure of interest: No

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HAEMORRHAGIC STROKE SEVERITY IN PATIENTS UNDER DIFFERENT OR NO ANTITHROMBOTIC THERAPY - A PRIMARY STROKE CENTER STUDY

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Background and aims: Nearly 1 to 1.5% of western population take oral anticoagulants. Little is known about the effect of antithrombotic therapy in the intracerebral haemorrhage (ICH) severity. We reviewed the ICH cases in our unit to determine severity differences among patients under antithrombotic therapy.
Methods: Descriptive, retrospective and observational analysis, including patients suffering spontaneous ICH for 11 years in a stroke unit. We devised patients in 4 groups: A - antiaggregated, B -antiaggreagated and anticoagulated, C - anticoagulated and D - no antithrombotic therapy. Severity was evaluated by the National Institutes of Health Stroke Scale (NHISS) and modified Rankin (mRankin) scale at admission.
Results: From 293 hospitalized patients due to ICH, 288 were selected. Group A included 46 (16%) patients, which NHISS mean was 11 and mRankin mean 4.3. Group C had 35 (12%) patients, their NHISS mean was 9 and mRankin mean 3.47. Group B included 5 (2%) patients, their NHISS mean was 8 and mRankin was 3.8. Group D included 202 (70%) patients whose NHISS mean was 9 and mRankin 3.46.
Conclusions: Analysis and conclusions are limited by the small size of population. Mean NHISS was similar in the different groups but mRankin scale at admission was superior in patients under antiaggreagtion. None of antithrombotic therapies seems to influence the severity of ICH, but further studies are needed. The knowledge of the antithrombotic therapy effect on ICH severity could help in the decision to initiate or stop this medication in a risk-benefit basis.
Disclosure of interest: No

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CLINICAL CHARACTERISTICS AND FORMS OF PRESENTATION OF CEREBRAL AMYLOID ANGIOPATHY RELATED-INFLAMMATION. CASE SERIES

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Background and aims: Cerebral amyloid angiopathy (CAA) is a pathological entity due to deposition of beta-amyloid protein in small cortical and subcortical leptomeningeal vessels. CAA related-inflammation (CAA-ri) represents an extremely infrequent form of CAA. For in-vivo diagnosis, clinicoradiological criteria have been proposed.
Methods: We prospectively recruited patients from our center who met the criteria for probable CAA-ri between November 2020 and February 2022. We recorded demographic characteristics, CSF analysis, neuroimaging, treatment and outcome (mRS at 3 months).
Results: 6 patients were included. Only one (16.7%) patient was female. Age ranged from 56 to 86 years. 3 patients (50%) debuted with Intracerebral Hemorrhage (ICH), two (33.3%) with epileptic seizures (one of them as status epilepticus), and one (16.6%) with rapidly progressive cognitive impairment. Two (33.3%) had history of amyloid spells. All had elevated proteins in the CSF but none of them had pleocytosis. Interestingly, the patient with a rapidly cognitive decline had low ß42 and ß42/ß40 ratio in CSF. On the MRI, microbleed pattern and cortico-subcortical hyperintensities on FLAIR-T2 were multihemispheric in 4 patients (66.6%). 5 (83.3%) patients presented punctate hyperintensities in diffusion sequences, and 3 (50%) had superficial siderosis. 5 (83.3%) received empirical treatment with corticosteroids and 2 (33.3%) started immunosuppressive treatment. One patient died due to massive ICH. The others improved partially but their functionality declined (mRS) at 3 months.
Conclusions: In our study, CAA-ri presented as ICH, epileptic seizures, or rapidly progressive cognitive impairment. Despite the relatively good response to immunosuppressive treatment, functional status worsened in the long-term.
Disclosure of interest: No

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Associations of non-contrast CT marker with long-term functional outcome in hypertensive intracerebral haemorrhage

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Background and aims: Hematoma expansion(HE) constitutes the most important treatment target in acute intracerebral haemorrhage(ICH), explicitly in hypertensive ICH with earlier HE-dynamics and with smaller volume increases profoundly influencing outcome. Various non-contrast CT(NCCT)-marker have been linked to an increasing HE risk, yet their influence on functional long-term outcome needs to be determined.

Methods: From the institutional prospective cohort-study, we retrospectively analysed patients with deep (hypertensive) ICH. All included patients received diagnostic and follow-up imaging within 48h for assessment of NCCT-marker and for volumetric analysis. The primary endpoint of the study was a modified Rankin Scale of 4-6 after 12 months. The secondary endpoint was the rate of HE, defined as relative increase of 33% or 6ml absolute increase. Multivariable analyses were conducted to address bias and confounding.
Results: We defined 322 patients eligible and NCCT-marker were frequently observed; NCCT-marker positive: 69.6% irregular shape, 55.9% heterogenous density, 52.5% hypodensities, 19.3% island sign, 11.5% black hole sign and 4.7% blend sign. Independently associated NCCT-marker with increased poor outcome were : irregular shape (aOR:2.73,CI:1.42-5.22;p=0.002), heterogenous density (aOR:2.62,CI:1.40-4.90,p=0.003) und island sign (aOR:2.54,CI:1.05-6.14,p=0.038). Independent predictors of HE were heterogenous density (aOR:5.01,CI:1.93-13.05;p=0.001) and hypodensities (aOR: 3.75,CI:1.63-8.62;p=0.002).
Conclusions: NCCT-marker provide important information for risk assessment in patients with deep(hypertensive) ICH. Specifically, density markers were associated with a 2.5-fold increased risk of poor functional long-term outcome, possibly driven by 5-fold increased risk for HE. These markers may aid clinical decision-making and could serve as selection criteria warranting prospective studies.
Disclosure of interest: No

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Non-contrast CT Markers Predict Hematoma Expansion and Long-term Clinical Outcome

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Background and aims: The aim of the study was to determine predictive associations of various non-contrast CT(NCCT)-marker with hematoma expansion(HE) and functional long-term outcome using a well-characterized study-cohort of patients with intracerebral haemorrhage(ICH).
Methods: From the institutional prospective cohort-study we retrospectively analysed all patients with primary ICH treated between 2006-2016. All patients received diagnostic- and follow-up-imaging within 48h for assessment of NCCT-marker and volumetric ICH analysis. Primary endpoint was HE, defined as 33% relative increase or 6ml absolute increase. Secondary endpoint was the rate of unfavourable outcome defined as modified-Rankin Scale 4-6 after 12 months. Doubly-robust methodology was used to address bias and confounding.
Results: We identified 1016 patients eligible and HE occurred in 17% (169/1016) of all patients. After doubly-robust adjustments three NCCT-marker were independently associated with HE; absolute increased risk in % by A) irregular shape:7.8(2.9-12.7), B) heterogenous density:10.1(5.5-14.7), C) hypodensities:8.6(3.2-14.0); with high negative predictive values(range:88-90%). The same NCCT marker were significantly associated with an increased risk for unfavourable outcome A) irregular shape:7.7(1.1-14.4), B) heterogenous density:7.8(2.3-13.4), C) hypodensities:7.5(1.9-13.1), whereas other NCCT marker (Island-, Blend-, Black hole-sign) were not significantly associated. Presence of these three NCCT-marker was associated with an early time window(0-3h), absolute increased risk for HE over 20%.
Conclusions: The NCCT-markers irregular shape, hypodensities, and heterogenous density are reliable to predict HE and unfavourable long-term functional outcome in patients with primary ICH. These results hold promise to maximize therapeutic benefits and may improve patients selection, warranting validation with enhanced study design.
Disclosure of interest: No

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Blood pressure indices and hematoma expansion in patients with intracerebral hemorrhage

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Background and aims: The relationship between blood pressure variability (BPV) and hematoma expansion (HE) in intracerebral hemorrhage (ICH) has not yet been fully established. We aimed to investigate whether BPV is associated with HE.
Methods: We conducted a prospective cohort study with ICH-patients admitted to our university hospital in Tübingen, Germany. BP was monitored invasively using an arterial line. Continuous BP values including systolic BP (SBP), diastolic BP (DBP) and mean arterial pressure (MAP) were overaged over time intervals of eight hours each from time of admission within the first 24 hours. The primary endpoint was the difference of systolic, diastolic and mean arterial BVP comparing ICH-patients with HE versus without HE after 24 hours. BPV was calculated with formulas as presented in Table 1. Secondary endpoint was the effect of BP on admission (oa) on HE.
Results: 259 ICH-patients (mean age±SD 71.9±13.7, 46.7% female, median NIHSS 6) were included. 35 (13.5%) patients had HE on follow-up brain imaging at follow-up imaging. The HE-cohort had higher NIHSS (p=0.004), ICH-score (p<0.001), ICH volume oa (<0.001), and higher prevalence of atrial fibrillation (p=0.001) (Table 2). There was no difference of BPV in ICH-patients with HE compared to those without. However, patients with HE had significantly higher DPB on admission (72 mmHg versus 84 mm, p=0.017) (Table 3).
Conclusions: Elevated DBP oa may be considered as predictor for HE. BPV within the first 24 hours was not associated with HE.
Disclosure of interest: Yes

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SURGICAL INTERVENTION FOR CEREBRAL AMYLOID ANGIOPATHY RELATED LOBAR HEMORRHAGE: A SYSTEMATIC REVIEW

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Background and aims: The risks and benefits of surgery for cerebral amyloid angiopathy (CAA) related lobar intracerebral hemorrhage (ICH) are unclear. We aimed to systematically review the literature on this topic.
Methods: We conducted a systematic review according to the PRISMA-2020 statement. Inclusion criteria were (1) randomized controlled trial (RCT), cohort, cross-sectional design, or case-series with >5 patients, (2) possible/probable/definite CAA according to the Boston criteria or autopsy, (3) surgical intervention for acute ICH, (4) data on perioperative and/or postoperative outcomes. Pooled estimates were calculated and the JBI Guidelines were used to assess risk of bias.
Results: We included fifteen case-series and four cohort studies (n=738 patients, mean age 70 and 56% women) Intraoperative hemorrhage occurred in 2/352 patients (0,6%). Pooled estimates for postoperative hemorrhage were 13,0% (30/225) for <48 hours and 6,2% (3/437) for 48-hours-14 days. Late recurrent ICH (mean follow-up time 19 months,

n=5 studies) occurred in 11% of patients. Outcome was predominantly poor with a pooled 3-month mortality of 19% and functional independence of 23%. Factors associated with poor outcome were advanced age, poor condition on admission, preexisting dementia and concomitant intraventricular, subarachnoid or subdural hemorrhage. All studies contained possible sources of bias and reporting was heterogeneous.
Conclusions: Surgery in CAA-related ICH is safe with limited intraoperative complications. Outcome, however, seems to be poor, especially in old patients, although good quality of evidence is lacking. CAA patients should not be excluded from ongoing surgery RCTs in ICH, to enable future subgroup analysis of this specific patient population.
Disclosure of interest: No

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HAEMATOMA EXPANSION IN INTRACEREBRAL HAEMORRHAGE (ICH): ABSOLUTE VERSUS RELATIVE DEFINITION AND IMPACT ON SHORT-TERM MORTALITY. DATA FROM A POPULATION-BASED STUDY

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Background and aims: Haematoma expansion (HE) after intracerebral haemorrhage (ICH) predicts poor outcome, but there is still no agreement on its definition. We sought to investigate factors associated with HE and its burden on the outcome of spontaneous ICH patients.
Methods: Patients with first-ever ICH, admitted from 2011-2020 in one of the hospitals of the district of L'Aquila, were recruited from a prospective population-based stroke registry. HE was defined as growth of $>$6ml (absolute HE) or $>$33% (relative HE) from the baseline to follow-up ICH volume. Baseline and follow-up volumes were obtained from the first and second brain CT performed within 24 hours from admission.
ICH volume was calculated according to the ABC/2 formula. Cox regression for univariate and multivariate analysis (using variables of the ICH Score) was used to test the association between HE and 30-day mortality.
Results: A total of 431 patients (61.2% men; mean age 74.7$\pm$12.8 years) had both first and second brain CT; 70 (16.2%) had absolute and 81 (18.8%) relative HE. Median ICH volume on admission was 14.0 (interquartile range, IQR 3.4-47.7) ml. Absolute HE was associated with 30-day case-fatality both at univariate (HR 2.09, 95% CI 1.43-3.06, p$<$0.001) and multivariate (HR 1.82, 95% CI 1.20-2.78, p=0.005) regression model, while relative HE was not (HR 1.31, 95% CI 0.85-2.02, p=0.222; HR 1.25, 95% CI 0.76-2.03, p=0.378).
Conclusions: According to our data, absolute HE is a better predictor of short-term ICH case-fatality than relative HE.
Disclosure of interest: No

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PREVALENCE AND ASSOCIATIONS OF CHRONIC KIDNEY DISEASE WITH CEREBRAL SMALL VESSEL DISEASE IN INTRACEREBRAL HAEMORRHAGE: A CROSS-SECTIONAL ANALYSIS

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Background and aims: The prevalence and associations of chronic kidney disease (CKD) with the cerebral small vessel diseases (cSVD) that cause spontaneous intracerebral haemorrhage (ICH) are incompletely characterised but may be helpful in improving understanding of ICH causes and prevention.
We aimed to investigate the prevalence of CKD and its associations with cSVD subtypes in patients with ICH.
Methods: We assessed SVD neuroimaging biomarkers of consecutive acute ICH patients, with available MRI, presenting to a specialist stroke centre, classifying patients into four subtypes: arteriolosclerosis; CAA (cerebral amyloid angiography); mixed SVD (i.e., likely arteriolosclerosis and CAA); and cryptogenic ICH (i.e., no evidence of a macrovascular/structural cause or SVD after extensive investigation). We estimated the prevalence of CKD (assessed from available hospital and general practice health records) in each ICH subtype using descriptive statistics, then compared these using multivariable logistic regression models with adjustment for confounding.
Results: 436 patients (mean age 67.2 years, 54.3% male) were included; 79 (18%) had CKD. The prevalence of CKD in each arteriopathy subtype was as follows: arteriolosclerosis 28/179 (15.6%); probable CAA 12/92 (13%); mixed SVD 37/129 (28.7%); and cryptogenic ICH 1/33 (3%). After adjusting for age, sex, and hypertension, CKD was independently associated with mixed SVD (OR 2.35, 95% CI 1.40–3.94, p=0.001).
Conclusions: CKD is common in ICH due to most SVD subtypes but rare in cryptogenic ICH. CKD might be a novel independent risk factor for mixed SVD-associated ICH. Further studies of the underlying mechanisms could help improve ICH prevention in people with CKD.
Disclosure of interest: No

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Management of patients with atrial fibrillation after suffering an intracerebral hemorrhage: The dilemma of restarting anticoagulation or not

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Background and aims: Management of patients with atrial fibrillation (AF) after an intracerebral hemorrhage (ICH) remains controversial. Our aim was to compare the rate of ischemic or hemorrhagic events according to the preventive treatment chosen in patients with AF after an ICH.
Methods: We conducted a single-centre retrospective study, including patients with ICH and AF admitted in a stroke unit. Patients were classified according to the preventive treatment prescribed as "not restarting anticoagulation" (NRA) or "restarting anticoagulation" (RA). Treatment decision depended on the advice of the clinicians. Primary outcome was rate of ICH, ischemic stroke (IS), any bleeding (AB) or any event (AE) (ischemic or hemorrhagic) at 3 years follow-up.
Results: 116 Patients were included. Average age was 79.6 years (SD 7.6), 72 were male (62.1%). Median baseline NIHSS was 7 (IQR 3-13). No

significant differences in baseline characteristics were observed between the two treatment groups. The median time elapsed between ICH and RA was 38 days (IQR 21-121).
In the age and baseline NIHSS-adjusted Cox regression analysis, NRA was independently associated with an increased risk of AE (Hazard ratio= 2.45 [95%CI, 1.14–5.26])
Conclusions: NRA was associated with an increased risk of IS or AE while RA did not increase the risk of hemorrhagic events in the follow-up.

	Cumulative rate % (95% CI)		p log-rank
	NRA n=62 (53.5%)	RA n=54 (46.5%)	
ischemic stroke	37.2 (11.5-62.9)	9.7 (0-20.5)	0.006
intracerebral hemorrhage	13.7 (2.1-25.3)	12.1 (1.9-22.3)	0.387
any bleeding	19.8 (5.9-33.7)	24.0 (10.5-37.5)	0.600
any event	53.1 (29.4-76.8)	31.7 (16.8-46.6)	0.019

Disclosure of interest: No

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RETROSPECTIVE EVALUATION OF 4-FACTOR PROTHROMBIN COMPLEX CONCENTRATE (4F-PCC) VERSUS ANDEXANET-ALFA (AA) FOR DIRECT ORAL ANTICOAGULANT (DOAC) REVERSAL- A COMMUNITY HOSPITAL EXPERIENCE

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Background and aims: Direct-Acting Oral Anticoagulant (DOAC) use has increased given multiple clinical trials demonstrating superiority or noninferiority to alternative anticoagulants for cardiovascular and VTE conditions. Current literature on the reversal of DOACs using AA compared to 4F-PCC is limited. The purpose of this study is to compare the safety and efficacy of 4F-PCC vs. AA for the reversal of DOAC-associated major bleeding.
Methods: This multicenter, retrospective, IRB-approved study was conducted in patients who were ⩾ 18 years and received either 4F-PCC or AA for apixaban or rivaroxaban reversal at a Cone Health facility from November 1, 2018 to November 30, 2022. The primary outcome was achievement of good or excellent hemostasis.
Results: A total of 80 patients were evaluated in the 4F-PCC group and 54 patients in the Andexanet-alfa group. Intracranial hemorrhage (ICH) was present in 40% and 44% of patients in the andexanet alfa and 4F-PCC groups, respectively. The primary outcome occurred in 59 (75%) patients and 46 (85%) patients in the 4F-PCC and AA groups, respectively (95% CI 0.73-5.57, p-value=0.19). There was no difference in mortality rates between both groups.
Conclusions: This retrospective evaluation showed AA was associated with a higher number of patients achieving hemostasis compared to 4F-PCC.
Disclosure of interest: No

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Neutrophil to leukocyte ratio and admission glycemia as predictors of short-term death in very old elderlies with lobar intracerebral hemorrhage

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Background and aims: The incidence of spontaneous intracerebral hemorrhage (SICH) is highest in very old elderlies (⩾ 75 years). The increasing use of antithrombotic drugs is shifting the epidemiology of SICH towards predominance of lobar subtype, suggesting an incremented propensity of bleeding associated with underlying cerebral amyloid angiopathy. With population aging and antithrombotic use, a parallel raise of proportion of lobar SICH is occurring. Improvement of prognostication in this specific age group and SICH type is needed. Routine blood biomarkers can contribute to prediction of short-term mortality after SICH.
Our aim was to investigate the contribution of routine blood biomarkers for short-term mortality (30-days) in elderly patients with lobar SICH.
Methods: Retrospective analysis of consecutive 130 patients with ⩾ 75 years and lobar SICH. The outcome was 30-day mortality. Logistic regression analysis was used to investigate whether admission routine biomarkers can be used as predictors
Results: The case fatality was 40.8%. Admission glycaemia level, neutrophil to lymphocyte ratio and men platelet volume were significantly different between groups ($p = 0.001$, $p = 0.024$, $p = 0.038$, respectively). There was no significant difference in all other routine biomarkers. On multivariate analysis, admission higher BG level (odds ratio [OR]: 1.010, 95% confidence interval [CI]: 1.001-1.019, $p = 0.026$) and neutrophil to lymphocyte ratio (OR: 1.070, 95%CI: 1.008-1.136, $p = 0.027$) emerged as predictors.
Conclusions: In very old patients with lobar SICH, higher BG level and neutrophil to lymphocyte ratio are associated with increased risk of short-term death.
Disclosure of interest: No

SAH, ANEURYSMS AND VASCULAR MALFORMATIONS

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THE CLINICAL SIGNIFICANCE OF PERIPHERAL BLOOD CELL RATIOS IN PATIENTS WITH INTRACRANIAL ANEURYSM

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Background and aims: Inflammation is an important factor in the development of aneurysm, and has been identified as a key characteristic

predictive of rupture of intracranial aneurysm (IA). However, the role of inflammatory peripheral blood cell ratios in patients with IA has not been well delineated.
Methods: A total of 1209 patients, including 1001 with unruptured IA and 208 with ruptured IA, were enrolled in this study. Neutrophil-to-lymphocyte ratio (NLR), platelet-to-lymphocyte ratio (PLR), platelet-to-neutrophil ratio (PNR), and platelet-to-white-blood-cell ratio (PWR) were compared between ruptured and unruptured IA
Results: Compared with the ruptured IA group, the unruptured IA group had higher PNR {median, 65.96 [interquartile range (IQR) 48.95–85.05] vs. 37.78 (IQR, 23.17–54.05); $p < 0.001$} and PWR [median, 36.89 (IQR 29.38–44.56) vs. 22.39 (IQR, 16.72–29.29); $p < 0.001$]. In multivariate analysis, PNR and PWR were independently associated with ruptured IA ($p=0.001$ and $p<0.001$, respectively). Unruptured IA subgroup analyses according to the PHASES scores showed that a higher PHASES score was associated with significantly higher NLR and erythrocyte sedimentation rate ($p < 0.001$ and $p = 0.025$) and lower PNR and PWR ($p < 0.001$ and $p = 0.007$).
Conclusions: We demonstrated that lower PNR and PWR levels are associated with ruptured IA and a higher PHASES score. Unlike many other inflammatory markers and bioassays, peripheral blood cell ratios are inexpensive and readily available biomarkers that may be useful for risk stratification in patients with cerebral aneurysm.
Disclosure of interest: No

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Investigation of Intracranial Aneurysm Formation by Comparing the Combined Influence of Haemodynamic Parameters Between Aneurysmal and Non-Aneurysmal Intracerebral Arteries

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Background and aims: Numerous studies have evaluated the effects of haemodynamic parameters on aneurysm formation. However, the reasons behind aneurysms not developing in intracranial arteries are unclear because studies have been conducted only on aneurysmal arteries without comparisons with non-aneurysmal arteries. This study aimed to investigate the influence of haemodynamic parameters, wall shear stress (WSS) and strain, on aneurysm formation.
Methods: Fifty-eight patients with paraclinoid aneurysms on one side were enrolled. In addition, two patients with paraclinoid aneurysms on both sides were registered to compare the results of arteries with paraclinoid aneurysms on one side and both sides. Based on MRA images, aneurysmal and non-aneurysmal artery models for each patient's left and right segments were constructed. After the aneurysms were eliminated to delineate the assumed original shape before aneurysm formation, computational fluid dynamics and fluid-structure interaction analyses were performed. Finally, the correlation between high WSS and strain locations was investigated for aneurysmal and non-aneurysmal arteries.
Results: In aneurysmal arteries, high WSS and strain locations were well matched with the aneurysm formation site. Also, considerable correlations between high WSS and strain locations were observed. However, there was no statistically significant relationship between high WSS and strain locations in non-aneurysmal arteries. In addition, high WSS and strain occurred in a region similar to that of aneurysm formation site in both left and right arteries for arteries with aneurysms on both sides.
Conclusions: The correlation between haemodynamic parameters and aneurysm formation is helpful for understanding aneurysm formation mechanisms and encouraging relevant research.
Disclosure of interest: No

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Association of epigenetic variants with the development of vasospasm in aneurysmal subarachnoid haemorrhage

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Background and aims: Vasospasm is a complication that affects up to 70% of patients with aneurysmal subarachnoid hemorrhage (aSAH), being a preventable cause of poor prognosis. Epigenetics might provide insight on the molecular mechanisms of vasospasm, which nowadays are not fully understood. We aimed to analyze the association between DNA methylation (DNAm) and development of vasospasm in aSAH.
Methods: We conducted an epigenome-wide association study in 282 patients with aSAH, admitted to our hospital from 2007 to 2018. DNAm was assessed with the EPIC Illumina chip (>850K CpG sites) in whole-blood samples collected at hospital admission. We firstly identified differentially methylated positions (DMPs) at the CpG level using Cox regression models adjusted for potential confounders. We subsequently used the DMP results to find differentially methylated regions (DMRs) and enriched biological pathways.
Results: A total of 145 patients (51%) experienced vasospasm. We identified one DMP (at SUGCT gene, mainly expressed in arteries) at the genome-wide level (p-value $< 10^{-8}$) in patients with vasospasm. Besides, there were 30 CpG candidates showing a nominal association (p-value $< 10^{-5}$). Region analysis revealed 30 DMRs, some of them were annotated to interesting genes such as HLA-B, HLA-DPA1, COL11A2 and COL23A1. Functional enrichment analysis showed that DMPs were annotated to genes involved in biological processes related to immunity, inflammatory response, oxidative stress, endothelial nitric oxide, and apoptosis.
Conclusions: Our results show a distinctive epigenetic profile in patients with vasospasm, suggesting a possible involvement in this complication. These findings need to be replicated in an independent cohort.
Disclosure of interest: No

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THE ASSOCIATION BETWEEN ANEURYSMAL SUBARACHNOID HAEMORRHAGE AND VITAMIN D SERUM LEVELS - AN ANALYSIS OF THE UK BIOBANK

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Background and aims: Inflammatory processes play a role in the development and rupture of intracranial aneurysms (IA). At present there is no medical treatment to reduce the rupture risk of IA. Vitamin D (Vit D) has anti-inflammatory properties and might reduce the chance of IA

development or rupture. We aimed to compare serum 25-hydroxyvitamin D [25(OH)D] levels of patients with aneurysmal subarachnoid haemorrhage (aSAH) vs. the general population using the UK Biobank (UKBB).
Methods: We included 502,411 participants from UKBB, a prospective cohort study, and analysed serum 25(OH)D levels between participants with and without aSAH during follow up. Patients with aSAH before baseline assessment were excluded.
Results: In 841 participants aSAH occurred during follow up. In the aSAH group (mean age 58 years); mean [25(OH)D] levels were 46.14 nmol/L (range 11.3 - 120 nmol/L); in the participants without aSAH (mean age 56 years), mean [25(OH)D] levels were 48.61 nmol/L (range 10 - 340nmol/L). No significant difference was observed between mean [25(OH)D] levels (p=0.42). 472 (56.1%) participants with SAH had vit D insufficiency determined by [25(OH)D] <50 nmol/L versus 248,191 (49.4%) of those without aSAH during follow up without any significant difference of proportion.
Conclusions: Shown by this large UKBB cohort, vit D levels were non-significantly lower in participants who developed aSAH during follow up, compared to those without aSAH. Next research steps are regression analysis, Mendelian randomization, and adjustment for other risk factors for IA such as hypertension, smoking and family history.
Disclosure of interest: No

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Symptomatic developmental venous anomalies

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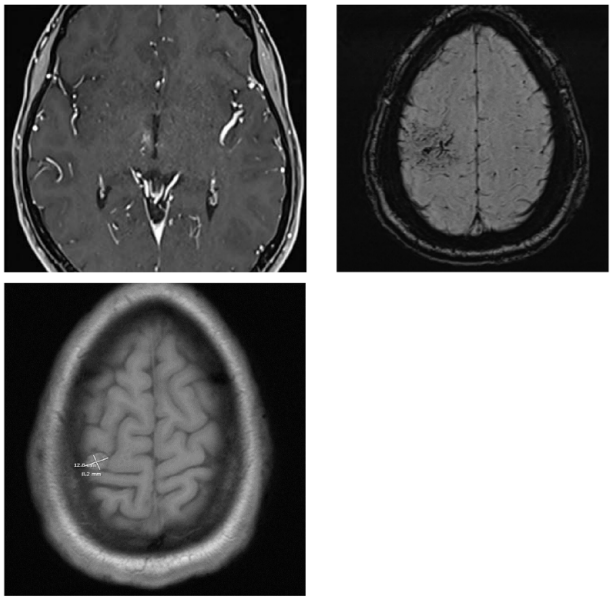
Background and aims: Developmental venous anomalies (DVA) represent rare and usually benign vascular malformations incidentally found on imaging. Symptomatic DVAs require a thorough work-up to identify the exact cause. We present two cases of symptomatic DVAs with different clinical presentations.
Methods: A 41-year-old female with a known DVA had a history of intermittent sensations in her left leg when being referred with subacute onset of vertigo, unsteady gait and worsening of hypesthesia in her left hemibody. Venous congestion of a right mesencephal DVA could be identified as the cause. The imaging did not show any arterio-venous fistula/malformation (AVM), microshunts or a major thrombosis. No procoagulatory state could be found on the lab tests. Oral anticoagulation with phenprocoumon was re-initiated as the most likely cause of the venous congestion was a recurrent partial thrombosis of the transmesencephal veins.
A 21-year-old male presented with three short episodes of focal clonic seizures in his left arm followed by a focal to bilateral tonic-clonic seizure. DVA over the right central sulcus with partial thrombosis of the venous drainage could be identified on the MR-Twist-Angiography. The preliminary results of the lab testing revealed no procoagulatory state in this case either. Oral anticoagulation and a short-term anticonvulsive therapy with levetiracetam was started.
Results: Conclusions: DVAs without an associated cavernoma can in rare cases become symptomatic. Symptoms are mostly flow-related due to reduced flow within, or outflow of the DVA. Surgical or interventional treatments are generally not warranted if an AVM or cavernoma have been ruled out.
Disclosure of interest: No



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Skin Biopsy As A Biomarker Of An Underlying Connective Tissue Disorder In Patients With Spontaneous Cervical Artery Dissection: A Systematic Review

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Background and aims: The underlying pathophysiology of spontaneous cervical artery dissection (sCeAD) remains unclear, with no validated biomarkers to identify patients at risk. Previous studies suggested that sCeAD might be the result of an underlying connective tissue disorder. We aimed to assess dermal ultrastructural aberrations of connective tissue by skin biopsy and genetic variations in patients with sCeAD.
Methods: We systematically searched the PubMed database until January 2023 with PRISMA guidelines. Original articles assessing skin biopsy in sCeAD patients were included. Two reviewers independently conducted the screening.
Results: We included 15 studies compromising 455 patients. Thirteen studies assessed ultrastructural changes and found aberrations of collagen and elastic fibers described as irregular contours and calibers of collagen fibrils, composite flower-like fibrils, fragmented moth-eaten elastin, and microcalcifications; overall, one or more of these findings noted in 50.2% patients. Seven studies showed no causative mutations in collagen type I, III, V, and elastin genes. One study showed a linkage between connective tissue alterations and chromosomes 15q2 and 10q26. Another study found significant CNV enrichments in genes involved in extracellular matrix organization and collagen fibril organization. Finally, one study showed differential expression of extracellular proteins linked to connective tissue disorder in patients with recurrent sCeAD using a quantitative proteomics approach.
Conclusions: Our review supports that an underlying, subclinical connective tissue disorder, likely genetically determined, may predispose to arterial wall weakness and sCeAD. Further studies with larger sample sizes and robust methodology are needed to better define the role of connective tissue in sCeAD pathogenesis.
Disclosure of interest: No

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Etiology of convexity subarachnoid hemorrhage: a wolf in sheep's clothing?

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Background and aims: Convexity subarachnoid hemorrhage (cSAH) is defined as nontraumatic subarachnoid bleeding localized to one or more sulci of the cerebral convexity without extension to the basal cisterns, interhemispheric sulci, or ventricles. The etiology of SAHc is highly heterogeneous and the evolution is usually favorable. The aim of this study is to describe a large case series of patients with SAHc.
Methods: We present a case series of patients admitted to the Neurology service or Stroke Unit of a tertiary hospital from 01/01/2017 to 06/15/2021, with a diagnosis of SAHc. Medical records were retrospectively reviewed and demographic, clinical and radiological variables were collected from them.
Results: N= 28. Mean age was 72 years (s= 15 years), 19(68%) women. Vascular risk factors were hypertension in 20(71.4%), dyslipidemia in 12(42.8%) and diabetes mellitus in 5(17.8%) patients. Eight(28.6%) of the patients were on antiplatelet therapy and 5(17.8%) were anticoagulated. The presentation was heterogeneous: 9(32.1%) patients presented thunderclap headache, 9(32.1%) epileptic seizures and 14(50%) neurological focal deficits. The most prevalent location was the parietal lobe (22;78.5%) cases, followed by the frontal lobe (13; 46.4%). The most frequent etiology was cerebral amyloid angiopathy(8;28.6%). Less prevalent causes were oral anticoagulant overdosage (3;10.7%), AVM (2; 7.14%) and reversible vasoconstriction syndrome (1; 3.6%). In-hospital mortality was 3(10.7%).
Conclusions: In this study cSAH was a rare and heterogeneous pathology with varied etiology. Although the clinical course is predominantly benign the underlying causes may have poor evolution. Multicenter studies could contribute to better define its risk factors and management.
Disclosure of interest: No

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Association between the cytokine concentration in cerebrospinal fluid and the severity of subarachnoid hemorrhage

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Background and aims: The early brain injury and arterial vasospasm following subarachnoid hemorrhage (SAH) directly influence its morbidity and mortality. To predict clinical course and evaluate the severity of SAH, we focused on the time course profile of cytokine concentration in Cerebrospinal Fluid (CSF) of SAH patients.
Methods: We collected clinical samples from 55 SAH cases (41 Female: 14 Male, Age: 32~85, WFNS Grade1: 24, Grade II/III :18, Grade IV/V: 12, Vasospasm case: 11, Fetal case: 4) and measured 27 cytokine concentrations in both CSF and blood serum on day 1, 3, 6 and 9 after onset of SAH.
Results: In cases which had no vasospasm, the 4 cytokines including G-CSF and IP-10 exhibited the upward trend of concentration up to day 9. However, the cases with vasospasm showed the no elevation of these cytokines. The severe cases (WFNS Grade IV andV) showed the significantly higher-level concentration of RANTES and bFGF on day 1. In all fetal cases, the extremely high concentration of G-CSF was detected on day1, and the high-level concentration of IL-6 was detected after day 6.
Conclusions: We demonstrated the characteristic association between the profiling of cytokine in CSF and severity of SAH including the early brain injury and the risk of vasospasm as vascular damage. The mechanism for the distinctive cytokine production in SAH needs to be elucidated in future.
Disclosure of interest: No

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Clinical events in patients with conservatively managed cerebral cavernous malformations: a single-center cohort study

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Background and aims: Treatment of cerebral cavernous malformations (CCM) varies between hospitals and consists of conservative management, surgery or radiotherapy. We report clinical outcomes in patients with conservatively managed CCMs.
Methods: We included consecutive adult patients with a CCM from our prospective single-center neurovascular registry, diagnosed between 2000-2022, and who were managed conservatively at diagnosis. Relevant data were extracted from medical health records. Clinical events scored during follow-up were: seizure(s), symptomatic hemorrhage(s) and new focal neurological deficits without overt hemorrhage.
Results: We included 283 patients (mean age 52 years; 46% men). The most frequent baseline clinical manifestations were symptomatic hemorrhage (113/283, 40%) and seizure (37/283, 13%). 90/283 (32%) patients were asymptomatic at diagnosis and 76/283 (27%) had multiple CCMs. During a median follow-up of 1.5 (IQR 0.3–6.3) years, 12/283 (4%) patients underwent surgery and 3/283 (1%) patients radiosurgery. Clinical events occurred in 87/283 (31%) patients: symptomatic hemorrhage 51/283 (18%) patients, seizure 33/283 (12%) patients, and focal neurological deficits 19/283 (7%) patients. A clinical event occurred more often in patients with a symptomatic presentation (6% versus 42%, $p<0.001$). During 1191 cumulative patient-years, annual symptomatic hemorrhage risk rates were 2.1% in patients who were asymptomatic at diagnosis and 4.5% in patients who were symptomatic.
Conclusions: In patients with conservatively managed CCMs, clinical events were relatively common, but annual bleeding risks were low, especially in those who were asymptomatic at diagnosis.
Disclosure of interest: No

1890

NEUROAXONAL INJURY MEDIATES THE ASSOCIATION BETWEEN HYPERGLYCEMIA AND POOR CLONICAL OUTCOME AFTER SPONTANEOUS SUBARACHNOID HEMORRHAGE

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Background and aims: Hyperglycemia during the early brain injury (EBI) period after spontaneous subarachnoid hemorrhage (SAH) is associated with poorer clinical recovery, but the physiopathological pathways underlying this association are unknown. This study assessed if hyperglycemia during EBI is associated with markers of neuroaxonal injury and whether these biomarkers mediate its association with poor clinical outcome.
Methods: Ninety-two SAH patients admitted within 24h of bleeding were prospectively included. Glucose levels were measured at arrival and every 6h for at least the following 72h. Neurofilament light chain (NFL) levels were measured at 72h in serum samples. Functional outcome was assessed with the modified Rankin Scale (mRS) at 90 days (poor outcome, mRs>2). The association between glucose metrics, NFL levels and clinical outcome was assessed with univariate and multivariate analyses. Mediation analysis evaluated whether NFL mediated the relationship between glucose and functional outcome.
Results: Both higher glucose and NFL levels during EBI period were associated with poor clinical outcome in adjusted analyses [adjusted-OR (95% CI), 1.04 (1.009-1.081) and 2.61 (1.364-5.010), respectively]. NFL levels were predicted by older age, poorer initial WFNS and higher glucose levels. In adjusted mediation analyses, the association between glucose and clinical outcome was significantly mediated by NFL levels (indirect effect, coefficient=0.01, 95%CI=0.001–0.040, $p<0.005$). The mediator NFL explained 25% of the association between glucose during EBI period and poor functional outcome at 90 days.
Conclusions: In SAH, the link between hyperglycemia during EBI period and poor clinical outcome might be explained in part through glucose-driven secondary neuroaxonal injury.
Disclosure of interest: No

1997

CLASSIFICATION OF NON-ANEURYSMAL SUBARACHNOID HAEMORRHAGE (NASAH) SINGLR CENTRE EXPERIENCE OF 450 PATIENTS

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Background and aims: The pathological causes of the10-20% NASAH patients have not detected yet. There are two known classifications of NASAH. Firstly, Rinkel et al (1993) categorized NASAH according to brain CT scan and CSF findings as perimesencephalic SAH (PSAH), non-perimesencephalic or d(NPSAH), and SAH with xanthocromic CSF findings and negative angiographic results. The second was presented by Fontanella et al (2011), as diffuse NASAH, perimesencephalic NASAH and perimesencephalic plus NASAH. The study aims were to clarify the types of NASAH and their different outcome
Methods: A retrospective review of all spontaneous SAH patients who admitted to the Walton Centre, Liverpool, UK from the 1st of January 2009 to the 1st of December 2019 was done. The initial CT scan, CSF results in-hospital and follow-up neuroimaging investigations were examined by a multidisciplinary team.
Results: During mentioned period, 1,957 patients with spontaneous SAH were treated in the hospital. In 450 (20.7%) patients, no secondary vascular etiologies were found (NASAH). Patients that included in this work were organized as five subgroups based on the initial cranial CT scan: 1) pure perimesencephalic NASAH with 180 (40%), 2) perimesencephalic-plus with 49(10.9%), 3) non-perimesencephalic with 61 (13.5%), 4) CT- negative /LP positive with 142 (31.5%), 5) superficial NASAH with 18 (4%) patients
Conclusions: One in five patients with SAH had spontaneous NASAH. Five subgroups were detected with different clinical and radiological presentation. Perimesencephalic NASAH was the most common and benign group with about 51% of the patients
Disclosure of interest: No

2092

STROKE UNIT AS A VALID AND REASONABLE ALTERNATIVE TO INTENSIVE CARE UNITS FOR LOW-GRADE NON-ANEURYSMAL SUBARACHNOID HEMORRHAGE: A SAFETY AND COST-MINIMISATION ANALYSIS

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Background and aims: Stroke Units (SU) have been suggested as a valid alternative to Intensive Care units (ICU) for initial admission of low-grade non-aneurysmal spontaneous subarachnoid haemorrhage (naSAH). We hypothesized that in-hospital complications and long-term clinical outcome in low-grade naSAH would be similar in both SU and ICU settings and that a cost-minimisation analysis would favour the SU.
Methods: Retrospective, single-centre study conducted in a third-level stroke-referral hospital, including low-grade spontaneous naSAH (WFNS 1-2). Primary outcomes were incidence of major neurological and systemic complications in the acute stage, and the functional status at three months. Additionally, a cost-minimisation analysis estimated the average costs that could be saved with the most efficient approach.
Results: Out of 96 patients, 30 (31%) patients were initially admitted to the ICU and 66 (69%) to the SU. Both groups were well balanced in demographic and radiological features except for a higher proportion of WFNS 2 in the ICU subgroup. There were no significant differences in the incidence of complications or in-hospital death between the ICU- and the SU-managed patients. Functional outcomes at 90-days were also equivalent in both groups, with more than 90% being independent (mRS 0-2). The cost-minimisation analysis revealed a significant monetary saving in favour of the straight-to-SU strategy.
Conclusions: In low-grade naSAH, initial admission into a SU might be comparable to ICU in terms of the incidence of complications and favourable clinical outcome at long-term with reduced hospitalization related costs. Further evaluation of the topic with prospective multicentre randomised designs is encouraged.
Disclosure of interest: No

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BILATERAL ANTERIOR CEREBRAL ARTERY STENOSIS DUE TO FIBROMUSCULAR DYSPLASIA: A STROKE OF UNUSUAL ETIOLOGY

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Background and aims: Fibromuscular dysplasia (FMD) is an infrequent etiology of ischemic stroke, a rare non-inflammatory and non-atherosclerotic arteriopathy of small and medium-sized arteries, affecting up to 3% of the population. The disease commonly affects renal arteries and extracranial internal carotids. Intracranial FMD is rare, often presenting with intracranial aneurysms, exceptionally presenting as intracranial stenosis.
Methods: We present a patient with ischemic stroke due to bilateral anterior cerebral artery (ACA) stenosis secondary to FMD and a brief review of the literature.
Results: A 58-year-old woman, with history of paraparesis due to Guillain-Barre syndrome and chronic migraine, presented severe headache and weakness in the left lower limb for 40 hours. Cranial CT showed an acute stroke in the territory of the right ACA without vascular occlusion on CT-angiography. Thrombophilia, autoimmunity, serological, cerebrospinal fluid and cardiologic studies showed no relevant alterations.
Brain MRI evinced infarction in right parietal lobe (Figure 1). MRI-angiography presented bilateral ACA stenosis (Figure 2). The arteriography (Figure 3) indicated signs of FMD at the level of both common ACA, carotid and vertebral arteries.
It was decided to initiate dual antiplatelet therapy for 3 months.
Conclusions: Intracranial damage appears in 2.1% of FMD, its manifestation as intracraneal stenosis is exceptional. The presence of stenosis can modify the therapeutic approach in FMD (dual antiplatelet therapy, stents, etc).
Therefore, we recommend performing an image of the intracerebral arterial circulation in FMD to exclude stenosis and potentially lethal aneurysm.

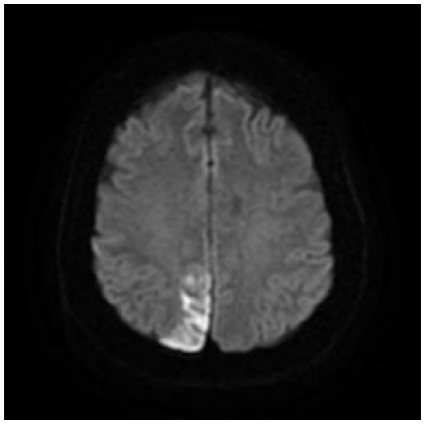
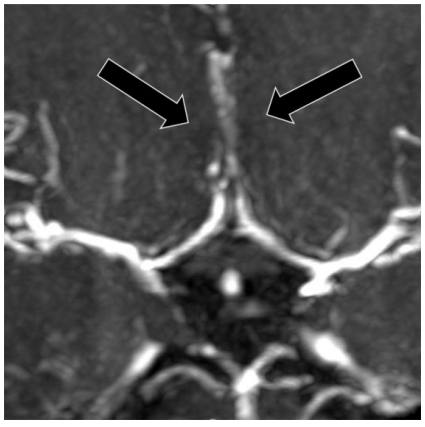


Figure 1.



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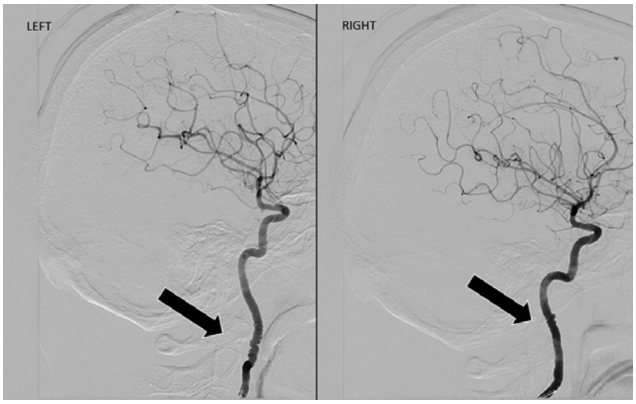

Figure 3.

Disclosure of interest: No

2318

PREDICTION OF ANEURYSMAL SUBARACHNOID HAEMORRHAGE IN COMPARISON WITH OTHER STROKE TYPES USING ROUTINE CARE DATA

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Background and aims: Aneurysmal subarachnoid haemorrhage (aSAH) can be prevented by screening for intracranial aneurysms (IA) in high-risk persons, followed by preventive treatment of IAs found. Predictions models for aSAH in the general population do not yet exist, while these are available for acute ischemic stroke (AIS) and intracerebral haemorrhage (ICH). We developed prediction models for aSAH, AIS and ICH in the general population using a large Dutch electronic health record (EHR)-derived primary care population-based cohort, and compared the performance of these models.
Methods: We selected patients >35 years without previous history of stroke and >1 year follow-up from the STIZON dataset, containing fully linked EHRs from 2007-2021. Stroke outcomes were based on ICD-codes. Predictors were based on demographics, symptoms and diagnoses. We cross-validated Cox proportional hazard's models with an elastic net penalty on a derivation cohort. We report discrimination, measured by c-statistic, on a validation cohort. Feature importance was assessed through model coefficients.
Results: During follow-up of 1,040,855 patients (mean age 54.6 years, 50.9% women, 10,173,170 person-years follow-up) 14,659 AIS, 2,083 ICH, and 723 aSAH events occurred. C-statistic was moderate for aSAH (0.61, 95%CI 0.59-0.64) and lower compared to AIS (0.78, 95%CI 0.78-0.79) and ICH (0.78, 95%CI 0.76-0.80). Age was the most important predictor for each outcome.
Conclusions: Our EHR-derived prediction model for aSAH in the general population showed lower discriminatory performance than those of the AIS and ICH models, which may be explained by the age at onset of aSAH being lower than that of AIS and ICH.
Disclosure of interest: No

2339

Development of diagnostic models for the detection of unruptured intracranial aneurysms in the general population

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Background and aims: The prevalence of unruptured intracranial aneurysms (UIA's) in the general population is 3%. Aneurysmal subarachnoid hemorrhage (ASAH) can be prevented by screening for UIA's followed by preventive treatment. We aimed to develop diagnostic models for the presence of UIA in the general population to assess whether persons at high risk of UIA's who may benefit from screening could be identified.
Methods: Using 1.5 Tesla brain magnetic resonance imaging data assessed for the presence of UIA's from the population-based Rotterdam Study, multivariable logistic regression models (for whole population, and men and women separately) with backwards predictor selection were developed. Model performance was assessed with discrimination, sensitivity, specificity, positive predictive value (PPV), and negative predictive values (NPV).
Results: 5835 persons were included (55.0% women, mean age 64.9±10.9 years) with UIA's in 130 (2.2%;68.5% women). The model for men showed the best performance, with a c-statistic of 0.70 compared to 0.65 for the whole population and 0.58 for women, and 62% sensitivity, 55% specificity, 99% PPV, and 2% NPV for UIA detection at a cut-off value of 1%. Based on the predictors age, hypertension, and smoking, UIA risk in men ranged between 0.39-1.86%.
Conclusions: The diagnostic model for men only had the best performance. Because this model could not identify men with an UIA prevalence above the average UIA prevalence in the general population, this model cannot contribute to identify individuals in the general population eligible for screening.
Disclosure of interest: No

2453

HOW SHOULD AN EVD BE CHALLENGED? A SINGLE CENTRE EXPERIENCE AND META-ANALYSIS

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Background and aims: The best way to challenge an external ventricular drain (EVD) is not clear. In general, EVD's are challenged by either clamping and removal (rapid) or raising, clamping and removal (gradual) approaches.
Methods: Data from a prospectively maintained database of consecutive SAH patients were analysed. For patients identified to have an EVD, additional data such as the method of challenge was abstracted from the clinical notes. We conducted a retrospective case-controlled study using propensity score matching to compare the effectiveness of the rapid versus gradual method of challenging an EVD in aSAH patients who survived to the time of EVD challenge. We also performed a meta-analysis of all relevant studies that compared rapid versus gradual EVD challenge.
Results: We identified 3 suitable studies from a total of 1566 initially identified articles based on our search terms. Data from our initial study, combined with these 3 papers demonstrated that gradual EVD (vs rapid weaning) was not associated with a significantly lower rate of VP shunt insertion (29% vs 33% OR 0.83 CI 0.61-1.12) or a significantly lower rate of CSF infection (14% vs 16%, OR 0.88 CI 0.64-1.23). Moreover, patients undergoing gradual weaning had a significantly longer length of stay (average 30 days vs 26 days, OR 0.30 (0.19-0.42).
Conclusions: These data suggest that the rapid wean approach is safe and does not lead to increase in increased complications such as need for VP shunt, and that it may be associated with reduced length of stay.
Disclosure of interest: No

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NIMODIPINE REDUCES MICROVASOSPASMS AFTER EXPERIMENTAL SUBARACHNOID HEMORRHAGE

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Background and aims: The L-type-calcium channel inhibitor Nimodipine is the only pharmacological treatment option for SAH-patients, however, the mechanisms of Nimodipine-mediated neuroprotection after SAH remain unclear.
It is increasingly recognized that microcirculatory dysfunction occurs early after SAH and significantly co-determines posthemorrhagic brain damage and, ultimately, neurological outcome. Prominent morphological features in the post-SAH cerebral microcirculation are microarterial constriction and microvasospasm (MVS) which have been detected in experimental as well as clinical studies. In the present study, we investigated the effect of Nimodipine on the cerebral microcirculation in a murine model of SAH.
Methods: Male C57 bl/6 mice (n=8/group) were subjected to subarachnoid hemorrhage using the middle cerebral artery perforation model. Six hours after SAH induction, mice received Nimodipine or vehicle and the cerebral microcirculation was assessed after cranial window preparation and application of fluorescent dye FITC-dextran. Microvasospasms and vessel diameter of cerebral vessels were assessed using in-vivo 2-photon-microscopy.
Results: Nimodipine significantly reduced the number of microvasospasm while having no effect on overall vessel diameter, i. e. non-constricted vessel segments, indicating that it specifically affects the formation of MVS.
Conclusions: Nimodipine reduces the formation of MVS. These results shed new light on the mode of action of a neuroprotective drug routinely used for more than 30 years for patients suffering from subarachnoid hemorrhage. Furthermore, our data suggest that L-type $Ca^{2}+$ channels may mediate microvasospasm formation after SAH thereby improving our pathophysiological understanding of this relevant process.
Disclosure of interest: No

2633

Treatment of aneurysmal subarachnoid hemorrhage over 10 years in a population-based study

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Background and aims: to evaluate trends in treatments of aneurysmal subarachnoid hemorrhage (aSAH) in the population.
Methods: Prospective population-based registry including patients with a first-ever aSAH occurring among subjects residing in the district of L'Aquila – central Italy – from 2011 to 2020. Patients were treated according to routine clinical practice and following national and international guidelines.
Results: We identified 149 patients with aSAH. Incidence rates were stable over time (P for trend=0.764). 103 (69.1%) patients with aSAH were treated with neurosurgical clipping (n=53; 35.6%) or endovascular coiling (n=50; 33.6%). Across the study period the relative proportion of patients treated with the two different approaches did not change (P for trend=0.678). Surgical treatment of aneurysms was associated with decreased 30-day (11.5% vs 58.3%; P<0.001) and 1-year (25.0% vs 70.8%; P=0.001) case-fatality compared with no surgery
Conclusions: According to our data, the treatment of aSAH remained stable over a decade; endovascular coiling and neurosurgical clipping had similar proportions over total cases. Surgical intervention was associated with a substantial decrease in case-fatality associated with aSAH.
Disclosure of interest: No

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Follow-up Imaging of Clipped Intracranial Aneurysms at 3T MRI: Comparison between 3D Time-of-Flight MR Angiography versus Pointwise Encoding Time Reduction with Radial Acquisition Subtraction-Based MR Angiography

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Background and aims: The metallic susceptibility artifact from implanted clips is a major limitation to follow-up imaging of clipped aneurysms (CAs) using 3D time-of-flight magnetic resonance angiography (TOF-MRA). Therefore, we evaluated the clinical feasibility of pointwise encoding time reduction with radial acquisition (PETRA) subtraction-based MRA for follow-up imaging of CAs comparing to TOF-MRA.
Methods: Sixty-two patients with 73 CAs were enrolled in this retrospective study. Patients underwent PETRA-MRA after TOF-MRA simultaneously at 3T MRI. Two neuroradiologists evaluated the overall image quality using a 4-point scale and the visibility of the parent artery and branching vessels near the clips using a 3-point scale. Subgroup analysis was performed according to the amount of the clips, such as less-clipped (1-2 clips) versus more-clipped (⩾ 3) aneurysms. The ability to detect aneurysm recurrences was also assessed.
Results: Compared to TOF-MRA, PETRA MRA showed acceptable image quality (3.97 ± 0.18 in TOF-MRA versus 3.73 ± 0.53 in PETRA-MRA) and had higher visibility of the adjacent vessels near the CAs (1.25 ± 0.59 in TOF-MRA versus 2.29 ± 0.75 in PETRA-MRA, p <0.0001). PETRA-MRA had higher visibility of the adjacent vessels in less-clipped aneurysms (2.39 ± 0.75 in less-clipped versus 2.09 ± 0.72 in more-clipped, p=0.014). Of 73 CAs, aneurysm recurrence in 4 cases was detected using PETRA MRA.
Conclusions: This study demonstrated that PETRA-MRA is superior to TOF-MRA in visualizing the adjacent vessels near the clips and can be an advantageous alternative to TOF-MRA for follow-up imaging of CAs.
Disclosure of interest: No

COGNITION AND VASCULAR COGNITIVE IMPAIRMENT

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DOC screen completion time: a novel marker of executive function, speed of processing and fluency

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Background and aims: The DOC screen was developed to identify Depression, Obstructive sleep apnea, and Cognitive impairment ("DOC" comorbidities) after stroke. Each component has its own score, but additional information may be gained from the time to complete the screen. We assessed the added value of using DOC screen completion time as a predictor of impairment on detailed cognitive assessments.
Methods: Consecutive English-speaking new referrals to the stroke prevention clinic were consented to participate in detailed neuropsychological testing (n=437). DOC screen scores and times were compared to cognitive test scores using multiple linear regression and receiver operating characteristic (ROC) analysis.
Results: Average completion time for the DOC screen was 3.8 ± 1.3 minutes. Completion time was a significant independent predictor of neuropsychological assessments measuring speed of processing ($p < .001$, 95% CI: -0.014 to -0.005), verbal fluency ($p < .001$, CI: -0.016 to -0.007) and executive function ($p < .001$, CI: -0.005 to -0.002). Completion time over 5.5 minutes on the DOC screen was associated with a high likelihood of having deficits in executive and speed of processing tasks.
Conclusions: DOC screen completion time is easy to collect and is independently associated with speed of processing, language and executive dysfunctions after stroke. People who take more than 5.5 minutes to complete the DOC screen are likely to have deficits in executive and speed of processing. These domains can be challenging to screen for in stroke survivors, and this measure provides a simple, clinically feasible method to screen these under-appreciated concerns.
Disclosure of interest: No

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Post-stroke cognitive impairment– prospective study in population of Georgia after stroke

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Background and aims: Vascular disorders are one of the major risk-factors for development of dementia after Alzheimer's disease. The purpose of our prospective study was to investigate the risk of dementia in patients with stroke and TIA.

Methods: The evaluation was done with neuropsychological test-battery - Vascular Impairment of Cognition Classification Consensus Study (VICCCS-2), which was renewed in 2018. Total of 335 patients were recruited with acute stroke and TIA. The detailed battery of neuropsychological assessment was completed 6 month after acute stroke.
Results: The study validated neuropsychiatric tests in Georgian language according to the international guidelines. The current study indicates the correlation between the severity of stroke and neuropsychiatric symptoms. Depending on these factors the daily activity and quality of life is poor in the group of patient with post-stroke dementia.
Conclusions: According to the further study we have first epidemiological data about the post-stroke dementia in Georgia. The vascular cognitive impairment risks were evaluated during the course of the study. Both factors are crucial for treatment and secondary prevention of stroke and dementia. Careful management of stroke and risk factors of post-stroke dementia with long-term follow up of cognition should be reinforced.
The study was performed with support of Shota Rustaveli National Science Foundation of Georgia.
Disclosure of interest: No

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ASSOCIATIONS OF NEOPTERIN, QUINOLINIC ACID, AND VITAMIN B6 RELATED BIOMARKERS (INDEXES) WITH POST-STROKE COGNITIVE IMPAIRMENT: THE NOR-COAST STUDY

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Background and aims: Neopterin, kynurenine pathway (KP) metabolites and B6-vitamines are linked to inflammation. As inflammation is proposed to be involved post-stroke cognitive impairment (PSCI), we aimed to investigate whether these biomarkers were associated with PSCI.
Methods: The Norwegian Cognitive Impairment After Stroke study (Nor-COAST) is a prospective multicentre cohort study of patient suffering from acute stroke, recruited from 2015 to 2017. Plasma samples from the index hospital stay of participants with ischemic strokes from this cohort, were available for analyses of neopterin, KP metabolites and B6-vitamines, by liquid chromatography/tandem mass spectrometry. Using mixed linear regression, adjusted for age, sex and creatinine, we investigated whether these biomarkers predicted cognitive outcome, measured by Montreal Cognitive Assessment scale (MoCA) at 3-, 18- and 36- months follow-ups.
Results: Preliminary results from 354 participants (mean age/SD 72/12 years; 57 % males; and mean NIHSS score/SD 3.7/4.4 at admittance) show that higher baseline concentrations of neopterin, quinolinic acid, an inflammatory marker based on vitamin B6 metabolites, the PAr-index ([4-pyridoxic acid]/[pyridoxal 5´phosphate + pyridoxal]) and a marker of functional vitamin B6 status, HKr ([hydroxykynurenine]/[kynurenic acid + anthranilic acid + xanthurenic acid + hydroxyanthranilic acid]), were associated with lower MoCA score at 3, 18 and 36 months post-stroke ($p < 0.01$).
Conclusions: These preliminary results support an association between systemic inflammation and poorer cognitive outcome post-stroke. Further, the results indicate that the neurotoxic effects of quinolinic acid, the KP pathway, the interferon-ɣ signalling pathway and activation of the cellular immune system may be involved in PSCI.
Disclosure of interest: No

721

IMPAIRED MUSCLE-BRAIN CROSSTALK VIA DOWNREGULATED PGC-1α/FNDC5/IRISIN/ BDNF AXIS AFTER CHRONIC STROKE IN NON-HUMAN PRIMATE

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Background and aims: Accumulated evidence has shown that skeletal muscle could crosstalk with brain via secreting irisin and exerts benefits on brain health and cognition by promoting BNDF expression. The study was carried out to investigate whether muscle-brain crosstalk was impaired via irisin due to muscle atrophy after chronic stroke and in turn impacted BDNF expression in hippocampus in a non-human primate stroke model.
Methods: Healthy male cynomolgus monkeys were randomly assigned into permanent left middle artery occlusion (MCAO) or sham group (n=3 per group). Neurological defects were assessed by NHPSS scale 12 weeks after the operation. Right tibialis anterior muscle and brain were collected 12 weeks after the operation. Skeletal muscle atrophy was confirmed via histological analysis. Impaired muscle-brain crosstalk was evaluated by analysis of PGC1α/FNDC5 expression level in right TA muscle, temporal change of serum irisin level and BDNF expression level in bilateral hippocampus CA1.
Results: Hippocampus was away from the primary infarction. Cynomolgus monkeys were remained with right hemiparesis and reduced movement 12 weeks after the stroke. In the MCAO group, fibre mean CSA was significantly reduced in the right TA muscle. PGC1α/FNDC5 expression level was also significantly reduced in right TA muscle. Correspondingly, serum irisin level was significantly lower in the MCAO group 12 weeks after stroke. BDNF expression was significantly downregulated in bilateral hippocampus CA1
Conclusions: Muscle-brain crosstalk is impaired after chronic stroke in non-human primate via downregulated PGC1α/FNDC5/irisin/BDNF axis. Further studies are needed to confirm the role of muscle-brain crosstalk in post-stroke cognitive decline.
Disclosure of interest: No

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THE CLOCK DRAWING TEST: DIAGNOSTIC ACCURACY IN SCREENING FOR EARLY POST-STROKE NEUROCOGNITIVE DISORDER IN THE NORWEGIAN COGNITIVE IMPAIRMENT AFTER STROKE STUDY (NOR-COAST)

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Background and aims: Although Montreal Cognitive Assessment (MoCA) is a valid screening test for post-stroke neurocognitive disorder (NCD), more time-saving tests could be preferred. We aimed to determine the diagnostic accuracy of the Clock Drawing Test (CDT) for post-stroke NCD and the association between CDT and MoCA.
Methods: The Norwegian COgnitive impairment After STroke (NorCOAST) study is a prospective, multicentre study of patients with acute stroke. Three months post-stroke, MoCA and a neuropsychological test battery was used to categorize patients into normal cognition, mild or major NCD. CDT scores ranged from 1 to 5. The accuracy of CDT for post-stroke NCD was examined using Receiver Operating Characteristics (ROC) curves. The association between MoCA and CDT was analyzed by Spearman's rho, and by linear regression with MoCA score as dependent variable and CDT score as covariate.
Results: We included 554 participants with complete CDT and with known cognitive status; 238 (43.0%) women, mean (SD) age 71.5 (11.8). The Area Under the Receiver Operating Characteristic curve (AUC) of the CDT for any NCD was 0.68 (95% CI 0.63-0.72) with 68% sensitivity and 60% specificity. The AUC for major NCD was 0.73 (95% CI 0.68-0.79) with 78% sensitivity and 53% specificity. Spearman's correlation coefficient between scores on MoCA and CDT was 0.50 ($p<.001$). CDT score predict MoCA score accounting for 41% of the variability in MoCA score ($p<.001$)
Conclusions: The CDT is inferior to MOCA and not sufficiently accurate for post-stroke NCD, however reasonable for major NCD.
Disclosure of interest: No

1406

Prospective Study of the association between Vascular Risk Factors, Blood-Brain Barrier Permeability, and Cerebrovascular Damage with Dementia Risk in Mild Cognitive Impairment

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Background and aims: Vascular risk factors (VRF) and cerebrovascular burden in neuroimaging are known to increase the risk of dementia conversion in individuals with mild cognitive impairment (MCI). The CSF/blood albumin ratio (Qalb) is a measure of blood-brain barrier (BBB) permeability previously associated with VRF as well. We aimed to investigate the interplay between VRF, Qalb, cerebrovascular burden (CB) and risk of dementia in MCI patients.
Methods: We conducted a prospective study in 144 consecutive MCI patients enrolled between 2017 and 2022. The study endpoint was a diagnosis of dementia (GDS $\geqslant$4). A composite vascular score (CVS) was calculated granting 1 point for the presence of several VRF (hypertension, diabetes mellitus, hyperlipidemia). CB was defined as Fazekas score higher than 1 and/or any vascular lesion. A Cox regression analysis was built adjusting for age, sex, CVS, Qalb, CB and Alzheimer's disease (AD) defined as a CSF-AD profile (aB42/pTau).
Results: Among our sample of patients with MCI, 62 cases (39.2%) developed dementia over a median follow-up of 25.9$\pm$13.9 months. The multivariate Cox analysis (Table 1) shows that only Qalb and AD were independently associated with dementia risk.
Conclusions: The only vascular factor independently related to a higher risk of dementia in our series of MCI patients is the increase in BBB permeability.

Table 1. Regression Cox analysis.

	OR (95%CI)
Qalb*	1.347 (1.191-1.524)
Alzheimer disease*	4.127 (2.210-7.706)
CVS	1.183 (0.890-1.574)
Age	.996 (0.944-1.051)
Sex female	1.631 (0.882-3.018)
CV	0.995 (0.572-1731)

*$p<0.05$.

Disclosure of interest: No

1619

Validation the Vascular Impairment of Cognition Classification Consensus Study (VICCCS) -2 battery for Georgian Language Population

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Background and aims: The prevalence of dementia is increasing last year. Over the past decades progress in understanding and management of vascular cognitive impairment (VCI) has been hampered by lack of diagnostic tools in Georgian language. The development of neuropsychological tools for the diagnosis of VCI is an important goal for health-care providers.
Methods: Translation and adaptation of VICCCS-2 battery was performed in full concordance with International Test Commission Guidelines. The patients and healthy participants were recruited from the outpatient clinic of Department of Neurology, Khechinashvili University Hospital, Tbilisi, Georgia, from January 1, 2020, March 1, 2020. Interview, neurological examination, and neuropsychological testing were conducted by board-certified neurologists.
Results: We studied 98 subjects: 50 persons without cognitive impairment, 48 patients with dementia. There was statistically significant difference in VICCCS-2 battery scores between healthy persons and patients with dementia.
Conclusions: In this study, we have shown validity of VICCCS-2 battery a diagnostic tool to VIC in Georgian-speaking population. Our data show statistically significant difference in VICCCS-2 battery scores between healthy individuals and patients with dementia. Georgian version of VICCCS-2 batter revealed good internal consistency in all groups. We were able to show validity and reliability of Georgian VICCCS-2 battery for the diagnostic of dementia in Georgian-speaking population. In conclusion, Georgian VICCCS-2 battery a valid and reliabilities, this can be used in neurological practice for evaluation of VIC.
Disclosure of interest: No

1675

Executive functions and resting-state functional connectivity in patients with frontal lobe stroke

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Background and aims: Dysexecutive syndrome, affecting working memory, planning, inhibition, and flexibility, is one of the most prevalent cognitive problems following prefrontal stroke, affecting daily life and quality of life. However, cognitive consequences of stroke have been understudied. Hence, this study aims to assess executive functions (EEFF) and resting-state functional connectivity (rsFC) in patients with fronto-striatal stroke.
Methods: Patients with chronic (6 months-5 years) frontal stroke and healthy subjects were recruited. The EEFF were assessed with Nesplora IceCream test (working memory and planning), Stop Signal Task (motor inhibition), Probabilistic Reversal Learning task (PRLT, flexibility) and Delay Discounting Task (impulsive decision-making). The rsFC of the orbitofrontal, dorsolateral prefrontal and posterior parietal cortex regions was assessed with functional near-infrared spectroscopy, which estimates brain hemoglobin concentrations. Uni-bivariate analysis was performed.
Results: Overall, 32 stroke patients (59% male) and 20 healthy subjects (50% male) were included. Age range was 21-57, 43% had right hemisphere stroke and the mean disease duration was 20.5 (IQR 11-39) months. Stroke patients demonstrated poorer planning performance in the Nesplora IceCream task ($p<0.05$) and lower cognitive flexibility ($p<0.01$) in the PRLT compared to controls. The rsFC between the left and right orbitofrontal cortex and the posterior parietal cortex were lower in stroke patients ($p<0.05$). No differences were found according to the laterality of the lesion.
Conclusions: Stroke patients presented impaired EEFF and reduced connectivity between the orbitofrontal and posterior parietal cortex compared to healthy participants. These findings could be useful in the diagnosis of dysexecutive syndrome after frontal lobe stroke.
Disclosure of interest: No

1776

Cognitive assessment instruments in randomized controlled trials of stroke from 2011 - present: A scoping review

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Background and aims: Cognitive impairments (CI) after stroke can be significant as it increases a patient's vulnerability to institutionalization, disability and decreased quality of life. Despite CI being present in majority of stroke survivors, the primary end points of most randomized controlled trials (RCT's) in stroke patients focus on physical function, with few studies using cognitive assessments. The objective of this scoping review is to identify, characterize, and summarize all RCT's evaluating cognition in adult stroke survivors from 2011-present, with the goal of determining what cognitive assessments and how frequently are they collected as an outcome.
Methods: All randomized controlled clinical trials of human participants are considered. All trials including human stroke participants (⩽18 years) published from 2011-present. The full search strategy, including all the identified relevant search terms was carried out on the following databases: Cochrane Central Register of Controlled Trials, Excerpta Medica Database (EMBASE), PsycINFO, Medical Literature Analysis and Retrieval System Online (MEDLINE).
Results: Across the 9481 articles that were screened, only 682 (7%) were RCT's that had at least one cognitive outcome as an endpoint. As an ongoing scooping review, the other additional information regarding the frequency and the type of assessments (screening vs detailed), and quality of data reporting as in pertains to completion/dropout rates will be presented at the conference.
Conclusions: The current review will provide information on the most commonly used cognitive assessment, will characterizing the trends in assessment choice, quality of reporting and completeness of outcomes.
Disclosure of interest: No

2132

CHAGAS DISEASE IS ASSOCIATED WITH LOW CEREBELLAR VOLUME BUT NOT SILENT ISCHEMIA

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Background and aims: Chagas disease (CD) is a major cause of heart failure/stroke in South America. Cognitive impairment occurs independently of heart failure severity, but pathophysiological basis is unknown. We aimed to investigate brain magnetic resonance imaging (MRI) findings in these patients.
Methods: Consecutive stroke-free patients with a diagnosis of heart failure were recruited from a university-based heart failure clinic, both with and without CD (serologic criteria - ELISA test). Patients underwent isovolumetric brain MRI and brain regions were automatically segmented using vol2Brain pipeline. Brain infarcts were counted by raters blinded to CD status.
Results: Thirty-seven patients were studied, median age 62 years, 25 (68%) with CD. Demographic and clinical characteristics were similar between groups except for more women among CD patients (80% vs 42%, p=0.029) and more preserved left ventricular function in CD patients (median left ventricle ejection fraction – LVEF=69% vs 30%, $p<0.001$). Lacunar infarcts were found in 30% of each group. In multivariable linear regression adjusted for age, sex, left ventricle ejection fraction and intracranial volume, CD was associated with lower volumes in the cerebellum when compared to non-CD patients (difference in total volume -11.5ml, p=0.050; gray matter volume -11.0ml, p=0.024; white matter volume -.44ml; p=0.847), with no difference in white matter hyperintensity volume (p=0.274).
Conclusions: Chagas disease is associated with lower volumes of cerebellum when compared with non-CD patients, independently of heart failure severity, despite similar rates of silent ischemia. In stroke-free CD patients, cerebellar involvement could be a link to cognitive impairment.
Disclosure of interest: No

2317

Sex differences in cognitive performance in patients with heart failure

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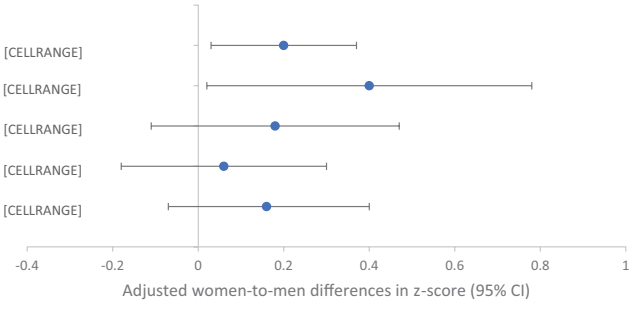
Background and aims: Cognitive impairment (CI) is common in patients with cerebro- and cardiovascular disease, including heart failure (HF). Characteristics of HF (e.g. ejection fraction [EF]) are known to differ between sexes. We aimed to investigate whether cognitive performance differs between women and men with HF, and secondly whether possible differences are modified by HF-characteristics or characteristics of vascular brain injury.
Methods: 162 patients (mean age 69.7±10.0, 33% women) with HF from the Heart-Brain Study underwent a neuropsychological assessment and brain-MRI. Results were standardized into z-scores (using a reference group) for memory, language, attention/speed, executive functioning and global cognition (the average across the four domains). With linear models we calculated age and education adjusted women-to-men differences (W-MΔ) in cognitive performance. Additional adjustments were made by adding separate covariates of HF- and vascular brain injury-characteristics.
Results: Women performed better on global cognition than men (W-MΔ in z-score 0.20, 95%CI 0.03-0.37), predominantly on the memory domain (0.40, 0.02-0.78)(Figure). These differences were largely attributable to an ischaemic HF-etiology, as they disappeared after adjustment for this. After adjustment for non-lacunar infarcts the difference in global cognition remained similar but the difference in memory performance disappeared. Adjustments for NYHA-class, EF, white matter hyperintensities and microbleeds did not change the results.
Conclusions: Women and men with HF differ in cognitive performance, these differences are related to an ischaemic HF-etiology and non-lacunar infarcts, but not to EF. These differences may result in under-estimation of CI in women, when only the memory domain is tested.



Disclosure of interest: No

2560

The association between inflammatory biomarkers with dementia after acute ischemic stroke

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Background and aims: The purpose of the study is to compare levels of inflammatory biomarkers such as neutrophil-to-lymphocyte (NLR), platelet-to-lymphocyte (PLR) and derived neutrophil-to-lymphocyte ratio (dNLR) in patients with post-stroke dementia (PSD) and without it and find the relationship between these markers and PSD.
Methods: 76 patients with acute ischemic stroke (AIS) were enrolled in this study and followed up during one month. The severity of stroke was assessed by the National Institutes of Health Stroke Scale (NIHSS) within 24h of admission. Hamilton Depression Scale (HDS) was used to evaluate depressive symptoms at a month after stroke. NLR, PLR and dNLR were calculated from the blood test at admission.
Results: 26 patients were diagnosed with PSD during one month period. Patients with PSD had higher NLR (2.41 vs 2.13, p=0.010), dNLR (1.72 vs 1.54, p=0.009), PLR (126.75 vs 112.3, p=0.015) compared to patients. The score of HDS in the patients with PSD was higher than patients without it after 1 month, 9 and 3 (p= 0.001) respectively. Values of dNLR (OR=1.833, 95% CI, p <0.05), PLR (OR= 1.828, 95% CI, p =0.05) and NLR (OR =1.732, 95% CI, p =0.05) were associated with occurance of PSD. The PSD group had a more severe stroke with NIHSS 3 and 2 (p<0.001), in turn.
Conclusions: Higher levels of dNLR, NLR and PLR were associated with an elevated prevalence of PSD and can use as prognostic marker to find early occurance of PSD.
Disclosure of interest: No

2626

PRESENCE OF COGNITIVE IMPAIRMENT AND FATIGUE IN TIA PATIENTS AND IN PATIENTS WITH LACUNAR STROKE. A PROPOSAL OF NEUROPSYCHOLOGYCAL ASSESSMENT PROTOCOL

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Background and aims: Even though CVD is the second cause of CI (cognitive impairment), there are no standardized batteries for its systematic assessment. Our objective is to describe the obtained results of a new neuropsychological assessment protocol.
Methods: We select patients with TIA or lacunar stroke in the last year, exempt from significant disability after the stroke (mRS<3). Assessment protocol: MoCA, TMT, SDMT and FDT for cognitive functions; and D-FIS, BDI-II and WHOQOL-BREF for measuring fatigue, depressive symptomatology and quality of life.
Results: We complete the study in 39 TIA (average age: 68) and 37 lacunar stroke patients (average age: 66) out of a total of 102 patients (51 per group), illiteracy being the main reason for incomplete realization. MoCA detected CI in 59% and 57%, respectively. TIA patients with CI scored worse on short-term memory recall and phonemic fluency, and lacunar patients with CI, in short-term memory recall and task switching. A greater difficulty in task stwitching (FDT) and cognitive flexibility was found in lacunar patients in comparison to TIA, although both obtained a very low score for this domain. In the remaining, scores were below population mean for both groups. TIA patients showed higher fatigue level (p=0,0039), according to DFIS. Values for mood and quality of life were typical and without differences between groups.
Conclusions: This protocol shows more than a half of TIA and lacunar patients experience CI, being memory, task switching and cognitive flexibility the most affected domains. TIA patients exhibit a greater level of fatigue.
Disclosure of interest: No

SMALL VESSEL DISEASE

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INCREASE ON ARTERIAL STIFFNESS ASSOCIATES WITH BLOOD BRAIN PERMEABILITY IN PATIENTS WITH A PREVIOUS LACUNAR INFARCT

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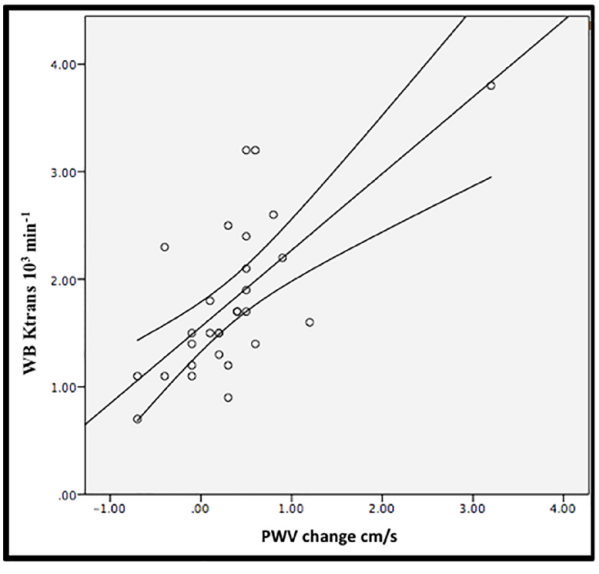
Background and aims: Cerebral small vessel disease is associated with increased blood-brain barrier (BBB) permeability. We studied the association between BBB permeability, blood pressure and arterial stiffness.
Methods: We evaluated 38 patients with Dynamic Contrast-Enhanced MRI(DCE-MRI) acquired with a 3T MRI. BBB permeability was evaluated for gray matter(GM), white matter(WM) and whole brain(WB) with the parameter Ktrans. Patients were selected after a recent lacunar infarct without cardiac or arterial sources of emboli. Brain MRI, 24h-SBP, 24h-DBP, pulse wave velocity (PWV), NT-proBNP and urinary albumin excrection(UAE) were obtained within 30 days after stroke and after 2 years of follow-up. 24h-SBP, 24h-DBP and PWV were measured with a cuff-based device. Follow-up MRI was assessed for the presence of either new lacunes or microbleeds.
Results: Median (IQR) age was 69(57-73) years and 31(81.6%) of the patients were men. DCE-MRI was acquired, median (IQR), 23(18-37) months after stroke. There were no differences on WB-Ktrans, GM-Ktrans or WM-Ktrans between patients with(n=9) or without(n=29) new lacunes or microbleeds on follow-up MRI. WB-Ktrans, GM-ktrans and WB-Ktrans were not correlated with age, 24h-SBP, 24h-DBP, PWV, NT-proBNP or UEF at inclusion or follow-up.
Follow-up was available in 29 patients. Median (IQR) ΔPWV was 3(-1-5) cm/s.WM-Ktrans($r=0.651$, $p<0.0001$) GM-Ktrans ($r=0.657$, $p<0.0001$) and WB-Ktrans ($r=0.530$, $p=0.003$) were associated with ΔPWV, but not with Δ24h-SBP, Δ24h-DBP, ΔNT-proBNP or ΔUAE.
Conclusions: The increase on arterial stiffness over the years might contribute to increased BBB permeability.
Disclosure of interest: No



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BLOOD-BRAIN BARRIER LEAKAGE IN CEREBRAL AMYLOID ANGIOPATHY – study design and preliminary analysis

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Background and aims: Pre-clinical studies suggest that blood-brain barrier (BBB) leakage may play a role in the pathophysiology of vessel rupture in CAA. Here, we apply 3 Tesla MRI to determine whether BBB leakage is increased in CAA patients compared to controls, and whether BBB leakage is associated with hemorrhagic brain injury in CAA.
Methods: Thus far, six patients with probable CAA without prior ICH and eight age-matched controls were prospectively included. Parenchymal BBB leakage rate (Ki) was assessed in the cortex and white matter with dynamic contrast-enhanced (DCE)-MRI and quantified with pharmacokinetic modeling. The number of foci of leptomeningeal enhancement was assessed visually on post-contrast heavily T2-weighted FLAIR images.
Results: We found lower K_i values in the cortex ($7.0*10^{-6}$ min^{-1} vs $10*10^{-6}$ min^{-1};Mann-Whitney U P=0.02) and white matter ($3.6*10^{-6}$ min^{-1} vs $7.1*10^{-6}$ min^{-1};Mann-Whitney U P=0.04) in CAA patients compared with controls. The presence and number of foci of leptomeningeal enhancement were higher in CAA patients (83%, median 2 foci) compared to controls (50%, median 1 focus). Within CAA, we found an association between cSS and number of foci of leptomeningeal enhancement (Spearman's $\rho=0.89$, $p=0.02$), but not between cortical BBB leakage and number of cortical CMBs (Spearman's $\rho=0.37$, $p=0.47$).

Table 1. Characteristics of the participants

	Patients with probable CAA (n=6)	Controls (n=8)	P-value*
Age, mean (sd)	70.8 (7.6)	68.6 (7.6)	P=0.66
Women, n (%)	3 (50%)	5 (62.5%)	P=0.28
Mixed type[1], n (%)	4 (66.7%)	-	
mean distribution CMB, lobar:deep	100:1.3	-	
Hypertension[2], n (%)	2 (33.3%)	2 (25%)	P=0.57
Hypercholesterolemia[3], n (%)	1 (16.7%)	1 (12.5%)	P=0.72
Overweight, n (%)	2 (33.3%)	1 (12.5%)	P=0.49
Smoking (current or stopped), n (%)	5 (83.3%)	5 (62.5%)	P=0.12
MMSE score, median (IQR)	27 (24-29)	29 (28-30)	P=0.21
MoCA score, median (IQR)	25 (21-29)	26 (24-27)	P=0.93
Intracranial volume in mm^3 10^6, median (IQR)	1.76 (1.59-1.84)	1.51 (1.48-1.68)	P=0.04
Brain/ICV ratio, median (IQR)	0.68 (0.65-0.72)	0.70 (0.69-0.71)	P=0.41
Cortical superficial siderosis (cSS)[4], n (%)	4 (66.7%)	0 (0%)	P=0.006
focal cSS, n (%)	0 (0%)	-	
disseminated cSS, n (%)	4 (100%)	-	
hemisphere score, n (%)			
3	1 (25%)	-	
4	3 (75%)	-	
Cortical microbleeds[4], n (%)	6 (100%)	1 (12.5%)	P=0.001
Amount, mean (min-max)	100 (20-249)	0.13 (0-1)	
BBB leakage rate (Ki) 10^{-6} per min^{-1}			
cortex, median (IQR)	7.0 (6.3-9.9)	10 (9.2-11.8)	P=0.02
white matter, median (IQR)	3.6 (2.5-7.5)	7.1 (5.9-10.5)	P=0.04
Leptomeningeal enhancement[5], n (%)	5 (83.3%)	4 (50%)	
number of foci, median (min-max)	2.0 (0-15)	1.0 (0-1)	P=0.08

*To compare patients with probable CAA to controls, we used Mann-Whitney U tests for nonparametric numerical variables and Chi-square tests for categorical variables.
[1]CAA diagnosis was changed to mixed-type small vessel disease due to deep bleeds previously unobserved on lower field MRI.
[2]Hypertension was defined as ≥140/90 mmHg and/or use of antihypertensive drugs.
[3]Reported in medical history and/or use of statin.
[4]Assessed by two independent experienced raters.
[5]Assessed by a single experienced rater.

Conclusions: Our preliminary results suggest that parenchymal gadolinium extravasation is lower in CAA patients compared with controls. In contrast, focal spots of leptomeningeal enhancement were more prevalent in CAA and associated with the severity of cSS. Inclusion is still ongoing (target:25 CAA patients and 20 controls) to further detail our findings.

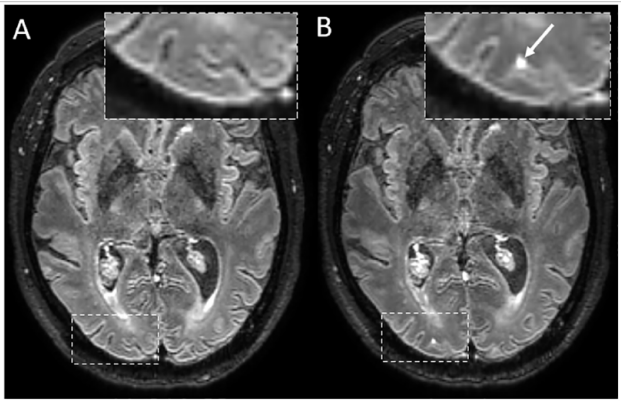

Figure 1. Leptomeningeal blood-brain barrier leakage in a patient with probable CAA.
A) Precontrast FLAIR image showing normal appearing cerebrospinal fluid. B) Corresponding postcontrast FLAIR image acquired approximately 16 minutes after contrast administration showing a focus of CSF enhancement in the occipital lobe (arrow).

Disclosure of interest: No

390

Impact of white matter hyperintensity changes on mobility and dexterity one year after mild stroke in people with small vessel disease

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Background and aims: White matter hyperintensities (WMH) worsen post-stroke functional outcomes. However, effect sizes vary and little is known about how longitudinal WMH changes relate to long-term outcomes. We assessed if WMH changes account for changes in mobility and dexterity over 1-year after mild ischemic stroke.

Methods: We assessed vascular risk factors (VRF), brain MRI, cognition (MoCA), mobility (Timed Up and Go; TUG) and dexterity (9Hole Peg Test; 9HPT) at baseline (⩽3 months post-stroke; N=229) and 1-year (N=203) prospectively. We assessed changes over time using linear mixed models with random intercepts. Predictors for TUG changes were stroke severity (NIHSS), combined VRFs, WMH volume (%intracranial volume) and occurrence of incident infarct; for 9HPT changes (dominant and non-dominant hand), we added index lesion side of brain and MoCA score.

Results: Baseline mean age=65.85, SD=11.13, 66% male. Between baseline and 1-year post-stroke, TUG time lengthened with older age (standardized B[95%CI]: 0.145 [0.022;0.268]), increasing NIHSS (0.117, [0.053;0.180]), expanding WMH volume (0.223 [0.097; 0.350]), and incident infarct (0.343 [0.038; 0.648]). Dominant hand 9HPT lengthened with increasing NIHSS (0.291 [0.187; 0.394]). Non-dominant hand 9HPT lengthened with increasing NIHSS (0.252 [0.166; 0.339]), right hemisphere lesion (0.277 [0.049; 0.504]), decreasing MoCA (-0.145 [-0.240; -0.050]), incident infarct (0.339 [0.062; 0.617]) and trend for expanding WMH volume (0.114 [-0.004; 0.233]).

Conclusions: Mobility, and probably non-dominant hand dexterity, at 1 year after stroke deteriorate with worsening WMH, independently of stroke.

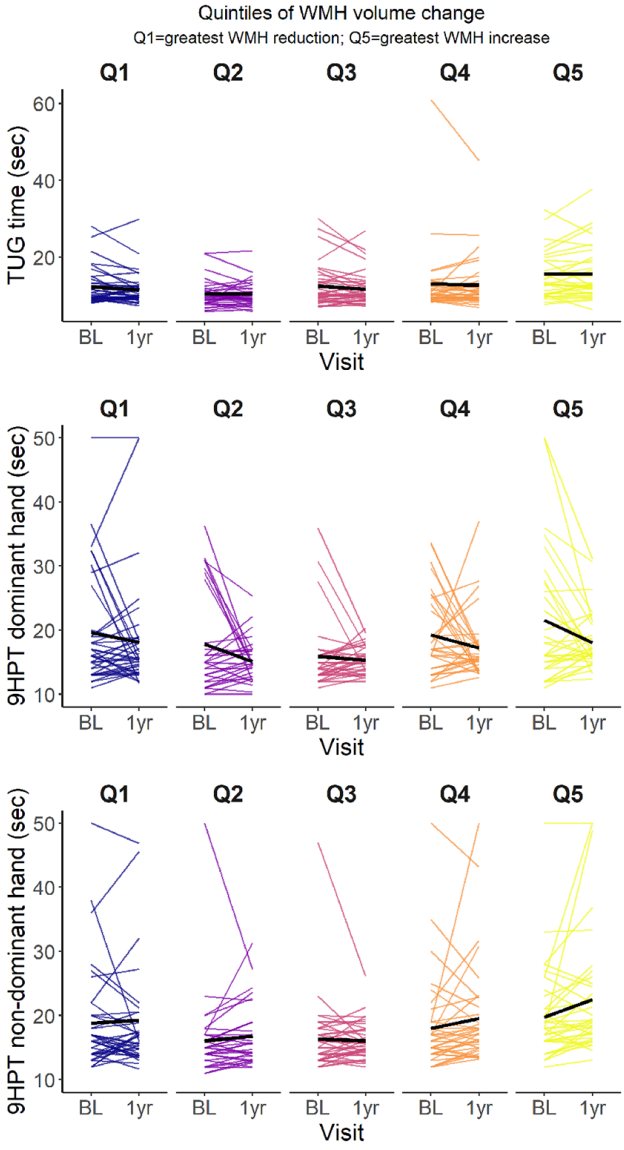

Fig 1. Change in TUG, 9HPT dominant hand and non-dominant hand per WMH volume change quintile.

Disclosure of interest: No

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THROMBOLYSIS IN LACUNAR STROKE: COMPARISON OF EARLY NEUROLOGICAL IMPROVEMENT AND FUNCTIONAL OUTCOME WITH CARDIOEMBOLIC STROKE WITHOUT LARGE-VESSEL OCCLUSION

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Background and aims: Thrombolysis is effective in the treatment of lacunar stroke (LAC). However, most studies compared the outcome of LAC to a heterogenous control group. We aimed to compare early neurological improvement (ENI) and late functional outcome following thrombolysis for LAC, with a homogenous control group of cardioembolic stroke (CE) without large-vessel occlusion (LVO).
Methods: Patient data were obtained from the national multicentre 'Stay Alive' Acute Stroke Registry. At each centre, vascular neurologists determined the TOAST classification. ENI was defined as a minimum 4-point decrease in the NIHSS score between admission and discharge or a complete resolution of symptoms. For late functional outcome, we analysed the dichotomised 30- and 90-day mRS scores (good outcome was mRS$\leqslant$2).
Results: 151 LAC and 173 CE thrombolysed patients were analysed. The percentage of ENI did not differ significantly (LAC 39.86% vs CE 46.95%, p=0.245). Multivariable analysis showed that the odds of ENI in LAC, but not in CE, were increased with pre-stroke antiplatelet treatment (aOR 2.332, 95%CI 1.097-4.958, p=0.028), and reduced in the presence of pre-stroke hypertension (aOR 0.239, 95%CI 0.072-0.794, p=0.019). LAC patients had significantly higher odds of achieving good functional outcome at 90 days (aOR 2.493, 95%CI 1.069-5.814, p=0.034) and also showed a trend at 30 days (p=0.06).
Conclusions: Pre-stroke antiplatelet treatment improved, but pre-existing hypertension worsened the chances of ENI after thrombolysis in LAC. This may have implications for primary prevention. LAC patients had better functional outcome at 90 days after thrombolysis than CE patients without LVO.
Disclosure of interest: No

550

SMALL VESSEL DISEASE IN PRIMARY FAMILIAL BRAIN CALCIFICATION WITH NOVEL TRUNCATING PDGFB VARIANTS

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Background and aims: Primary familial brain calcification (PFBC) is a neurodegenerative disease presenting with bilateral calcification in the brain, more specifically in the basal ganglia and cerebellum, leading to neurological and neuropsychiatric manifestations. Different variants in the *PDGFB* gene have been shown to present with PFBC and white matter hyperintensities (WMH), suggesting a manifest cerebrovascular process. Here we report two truncating variants in the *PDGFB* gene causing symptomatic PFBC and cerebrovascular disease with stroke episodes. Our aim is to study the possible correlation between PFBC and stroke, and to evaluate whether this condition is systemic or limited to the cerebral vessels.
Methods: Two Swedish families with novel truncating *PDGFB* variants, p.Gln140* and p.Arg191*, are described clinically and radiologically. Subcutaneous capillary vessels in affected and unaffected family members were examined in light and electron microscopy.
Results: All mutation carriers in our study showed WMH and bilateral brain calcifications. The clinical presentation differed, with movement disorder symptoms dominating in family A versus psychiatric symptoms in family B. Intracerebral hemorrhages, transitory ischemic attacks (TIA) and asymptomatic ischemic lesions were identified in both families. No classical vascular risk factors were detected. Skin microvasculature was normal in both affected and unaffected individuals.
Conclusions: Patients with these truncating variants in *PDGFB* causing PFBC, have small vessel disease in the brain but not the skin. The correlation between PFBC and stroke/TIA in our patients with no other classical vascular risk factors suggests that PFBC is associated with cerebral small vessel disease.
Disclosure of interest: No

836

BASELINE MICROSTRUCTURAL INTEGRITY ON DIFFUSION TENSOR IMAGING PREDICTS WHITE MATTER HYPERINTENSITY 'CAP' AND 'TRACK' FORMATION ADJACENT TO SYMPTOMATIC LACUNAR INFARCT

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Background and aims: Half of symptomatic lacunar infarcts develops secondary white matter hyperintensities (WMH) in the adjacent superior or inferior white matter ('cap' or 'track' respectively) and are associated with long-term dependency. However, WMH 'cap/track' pathophysiology remains unknown. We aimed to assess the relationship between baseline microstructural integrity of normal-appearing white matter (NAWM) and WMH 'cap/track' formation at one year after lacunar stroke.
Methods: We prospectively enrolled patients with a recent symptomatic lacunar infarct who underwent MRI at baseline and 1-year post-stroke. We measured baseline NAWM microstructural integrity as diffusion tensor imaging fractional anisotropy (FA) and mean diffusivity (MD). We identified WMH 'cap/track' present at 1-year on FLAIR, classified as none; 'cap' alone; 'track' alone; both 'cap' and 'track'. We performed multinominal logistic regression to assess the association between baseline NAWM FA/MD and 1-year WMH 'cap/track' presence, adjusted for demographics, vascular risk factors, infarct size and location.
Results: We included 173 patients (mean age 64). Eighty-five (49%) patients developed any WMH 'cap/track' (17 'cap' alone, 33 'track' alone,

35 both). Baseline NAWM-MD (but not FA) differed by 'cap/track' category (median 0.76 [0.74-0.78] for none, 0.77 [0.75-0.79] for 'cap' or 'track' alone, 0.78 [0.76-0.80] for both, p=0.030). Higher NAWM-MD was associated with the formation of both 'cap' and 'track' (OR=1.95, 95%CI 1.15-3.31, p=0.013).

Conclusions: Elevated baseline NAWM-MD increases the risk of WMH 'cap/track' formation adjacent to index lacunar infarcts at one year. Poor NAWM microstructural integrity may predispose to secondary white matter damage and hence worse clinical outcome after lacunar stroke.

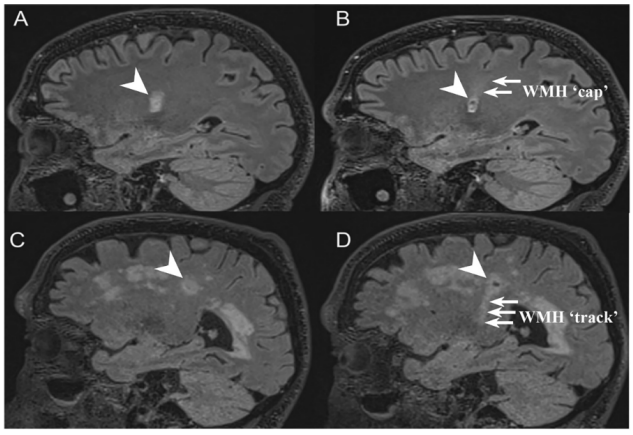

Fig 1. Two representative cases of WMH 'cap/track'. **A**, Baseline MRI 3 d after stroke onset showed a symptomatic lacunar infarct in the left internal capsule (white arrowhead). **B**, Follow-up MRI 425 d after onset, superior to the index infarct, showed an ascending WMH 'cap' (white arrows). **C**, Baseline MRI 36 d after stroke onset showed a symptomatic lacunar infarct in the right centrum semiovale (white arrowhead). **D**, Follow-up MRI 476 d after onset, inferior to the index infarct, showed a descending WMH 'track' (white arrows).

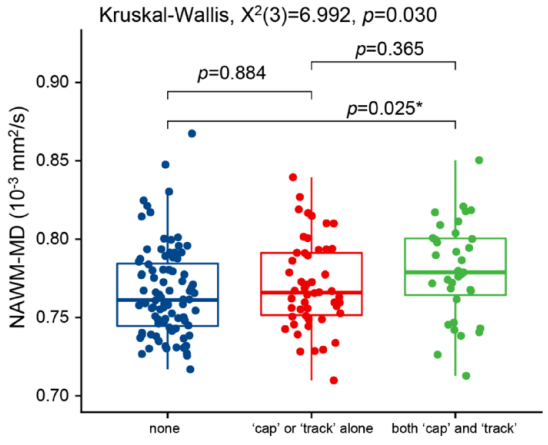

Fig 2. Boxplot of baseline NAWM-MD values by WMH 'cap/track' presence. Kruskal-Wallis test for overall comparison and post hoc multiple group comparison with Bonferroni correction.

Disclosure of interest: No

893

N3SVD-SCALE: A SIX-STAGE CADASIL AND NOTCH3-SMALL VESSEL DISEASE SEVERITY SCALE, INTEGRATING NEUROIMAGING AND CLINICAL MEASURES

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Background and aims: The spectrum of *NOTCH3*-associated small vessel disease (NOTCH3-SVD) ranges from CADASIL with mid-adult onset ischemic strokes to a much milder and later-onset small vessel disease. Currently, there is no single disease severity scale integrating cardinal neuroimaging and clinical features, precluding a uniform classification of disease severity across all disease stages. Here, we propose a 6-point scale (N3SVD-scale), capturing the full range of NOTCH3-SVD disease.

Methods: We designed a 6-point scale by integrating clinically relevant measures that are readily available in clinical practice to ensure easy use and applicability in both the clinical and research or trial setting. We tested the validity of the N3SVD-scale in four independent CADASIL cohorts (total n= 329 patients) and in a cohort of *NOTCH3*-positive individuals in UK-Biobank who also had an MRI available (n= 101).

Results: The N3SVD-scale was significantly associated with relevant disease outcome measures not included in the scale itself (global cognition, processing speed, brain volume, brain microstructural integrity, and blood levels of Neurofilament Light-chain) and outperformed conventional scales often used in CADASIL studies, such as modified Rankin scale (mRS), especially for the pre-manifest disease stages.

Conclusions: The N3SVD-scale is associated with NOTCH3-SVD and CADASIL disease severity and gave an unprecedented insight into differences in disease severity distribution between CADASIL cohorts and between CADASIL cohorts and *NOTCH3*-positive individuals in UK-Biobank. The N3SVD-scale is a simple tool to uniformly describe, compare, select or stratify *NOTCH3* positive individuals and CADASIL patients in the clinic, clinical studies and trials.

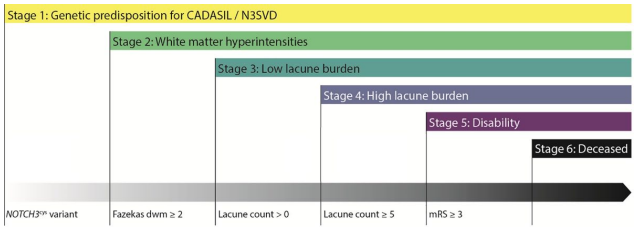

Figure. NOTCH3-associated SVD-scale (N3SVD-scale).

Disclosure of interest: Yes

912

PREVALENCE OF CEREBRAL MICROBLEEDS IN DIFFERENT VASCULAR RISK COHORTS: OBSERVATIONS FROM THE BERLIN LONG-TERM OBSERVATIONAL STUDY OF VASCULAR EVENTS (BELOVE)

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Background and aims: Cerebral microbleeds (CMBs) are a common incidental finding on blood-sensitive MRI sequences of the brain. In stroke patients, pre-existing CMBs are associated with an increased risk of

subsequent cerebral ischemic and haemorrhagic events. To date, data on prevalence and clinical significance of CMBs in patients with other vascular diseases is scarce.
Methods: We assessed the prevalence of CMBs in patients with (1) an acute ischemic stroke, (2) in patients with an acute myocardial infarction, and (3) in patients with a high risk for cardiovascular diseases (in particular: patients with type 2 diabetes mellitus) from the Berlin Long-Term Observational Study of Vascular Events (BeLOVE, recruitment period 09/2017 - 12/2020). MRI examinations were performed 103 days (median, IQR: 87 – 118 days) after study inclusion. The CMBs were detected on T2*-weighted MRI and evaluated by two independent raters.
Results: A total of 513 patients were included in this analysis. CMBs were present in 88 out of 280 patients with an ischemic stroke (32%), in 23/121 patients with myocardial infarction (20%) and in 28/112 patients with type 2 diabetes mellitus (25%). CMBs were located strictly lobar in 49% of patients with an ischemic stroke and in 57% of both patients with myocardial infarction and type 2 diabetes mellitus.
Conclusions: CMBs are a disease-overarching finding. We are currently assessing whether established risk factors for CMBs in stroke (e.g. ageing, hypertension and white matter hyperintensities) also apply to other vascular risk cohorts.
Disclosure of interest: No

996

Relationship of arterial stiffness and baseline cerebral small vessel disease score, with the occurrence of new lesions after 2 years of follow-up, independently of BP control

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Background and aims: Hypertension is a prominent determinant of cerebral small vessel disease (cSVD). The aim of this study was to assess in subjects with a recent lacunar stroke, the factors associated with the occurrence of new lesions of cSVD after 2 years of follow-up.
Methods: Patients with a recent small subcortical infarct were consecutively included in this prospective study. Clinical blood pressure (BP) was measured after 5 min of rest in a sitting position using a validated semiautomatic device. Three measurements of BP were averaged to determine values of clinical BP at baseline and at 3, 6, 12 and 24 months of follow-up. 24h-Ambulatory blood pressure monitoring was performed after hospital discharge within 30 days after stroke onset and after 2-years follow-up. Brain MRI was performed at admission and at 2-years follow-up.
Results: A total of 103 patients, aged 67.04 years, were included. Follow-up MRI was acquired in 92 patients. Backwards stepwise logistic regression analysis showed that 24h-PWV (OR 1.44 CI 95% 1.01-2,06 p=0.044) and cSVD score (OR 2.3 CI 95% 1.41-3.77, p=0.001) were associated with the presence of new lesions. Significance for 24h-PWV was lost after introducing age in de model, and only cSVD score remained significant (OR 2.33 CI95% 1.34-3.98, p=0.002). The presence of new lesions was not significantly different between patients with or without BP control.
Conclusions: In subjects with a lacunar stroke, 24h-PWV and cSVD score were associated significantly with the presence of new lesions after 2 year of follow-up, independently of BP control
Disclosure of interest: No

1190

NEUROVASCULAR COUPLING IN CEREBRAL SMALL VESSEL DISEASE: A SYSTEMATIC REVIEW

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Background and aims: The detailed pathogenesis of cerebral small vessel disease (cSVD) remains unclear however white matter hyperintensities (WMH) are associated with endothelial cerebrovascular dysfunction. Neurovascular coupling (NVC) measures endothelium-mediated vasodilatation to neuronal activity and may provide a novel index of cSVD-related cerebrovascular dysfunction.
Methods: EMBASE and PubMed were searched for studies examining the link between STRIVE-defined markers of cSVD and NVC to visual, motor, or cognitive stimuli during MRI, TCD, PET, or NIRS, from inception to November 2022.
Results: Of 29 included studies (19 case-controls, 10 cohorts), 14 reported reduced NVC with increasing cSVD, 15 reported no consistent effect and 4 reported increased NVC. WMH were the commonest marker, with reduced NVC with more severe WMH in 18 of 28 studies. Associations between NVC and other cSVD markers were less frequently reported. NVC was reduced in 5 of 10 studies with microbleeds, 3 / 5 with lacunar stroke but no associations were reported with PVS. More severe cerebral amyloid angiopathy (CAA), the commonest reported phenotype, was associated with reduced NVC in 6 / 7 studies. All 4 studies in monogenic CADASIL reported reduced NVC with increased severity of cSVD.
Conclusions: Although most studies were of limited quality, NVC was consistently reduced with increasing WMH in the majority of studies, with consistent associations in limited studies of CADASIL and CAA. NVC may be a useful marker of endothelial dysfunction in future studies of cSVD, but its utility as a marker of secondary damage versus a causal factor requires further investigation.
Disclosure of interest: No

1248

CEREBRAL SMALL VESSEL DISEASE BURDEN AS A PREDICTOR OF LONGITUDINAL COGNITION IN PATIENTS WITH TRANSIENT ISCHEMIC ATTACK

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Background and aims: Small vessel disease (SVD) is associated with stroke and cognitive decline. In this study, we aimed to investigate how SVD is longitudinally related to cognitive performance in transient ischemic attack (TIA) patients compared to controls.
Methods: We rated SVD at baseline on MRI in TIA patients (n=197) and controls (n=113) for microbleeds (CMB), lacunes, white matter hyperintensities (WMH), and perivascular spaces (EPVS). Neuropsychological

testing was administered across 5 years using the following assessments: BVMT, RAVLT, TMTA, TMTB, and WAIS-R.
Results: At baseline, TIAs were more likely to have a total SVD score⩾2 than controls, p<.001. Mixed models demonstrate that those with SVD⩾2 or basal ganglia EPVS>20 performed slower on both TMTA and TMTB across all timepoints. Those with periventricular WMH⩾2 performed slower on TMTB, as did those with deep WMH⩾2 or centrum semiovale EPVS>20. Those with centrum semiovale EPVS>20 also performed worse on WAIS-R. Lacunes⩾3 performed slower on TMTA. When stratifying results by group, associations were generally found in TIA, not controls.
Conclusions: Findings demonstrate that SVD is associated with poorer cognitive performance longitudinally, and is more pronounced in TIA compared to control.

Table 1.

Score	TMTA		TMTB		WAIS-R	
	Difference (in seconds)	95% CI	Difference (in seconds)	95% CI	Difference (score)	95% CI
Periventricular WMH⩾2			20.3	8.4-32.2		
Basal ganglia EPVS>20	10.1	4.7-15.5	21.2	3.4-39.1		
Centrum semiovale EPVS>20			27.2	10.6-43.8	-18.6	-35.0–(-2.2)
Lacunes⩾3	4.0	0.1-7.9				
SVD Total⩾2	3.7	0.4-7.0	13.9	2.9-24.9		

Disclosure of interest: No

1648

INTERNATIONAL SURVEY REVEALS LACK OF SPECIALISED CEREBRAL SMALL VESSEL DISEASE SPECIFIC CLINICS AND SIGNIFICANT INTER AND INTRACONTINENTAL VARIATION IN PRACTICE

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Background and aims: Cerebral small vessel disease (SVD) causes ischaemic stroke, intracerebral haemorrhage and vascular dementia; its clinical impact and potential need for specific assessment and treatment are now emerging. We aimed to identify any current SVD-specific services, assess general patterns of practice, and patient-reported concerns.
Methods: We sent a quantitative online survey to healthcare centres potentially treating patients with SVD. All answers were anonymised (with an option to sign). We used descriptive statistics to compare the clinical work-up for SVD patients between SVD-dedicated and non-SVD-dedicated services.
Results: From 210 invitations, we received 104 responses (rate=50%); 89 responses from 29 countries contained analysable data. Eleven centres (12%) reported having SVD-specific services, seeing a median of 150 [IQR 275.8] patients/year. Of 78 centres without an SVD-specific service, 60 (77%) believe there is a local unmet clinical need, and 88% thought an SVD-service would be useful. 80% of clinicians reported cognitive decline as the main concern of patients, and although 67% felt cognition should be assessed in SVD patients, there was significant variation in assessment (18 different cognitive tests mentioned), 25% did not assess cognition, and only 25-30% follow-up cognition, function or recurrent stroke in patients with SVD in non-SVD dedicated stroke services.
Conclusions: Most hospitals did not have SVD-specific clinical services and consider this a major unmet clinical need. Although cognition is major patient concern, assessment is varied. Standardised assessment and management would improve services, and potentially outcomes, for patients and healthcare systems.
Disclosure of interest: No

1717

Assessment of cognitive creativity in patients with cerebrovascular disease

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Background and aims: Creativity is the ability of a person to deviate from standard ideas, rules and patterns. Cognitive creativity is considered today as one of the most important criteria for functional recovery in organic lesions of the central nervous system.
The aim of the study was to evaluate cognitive creativity in patients with cerebrovascular disease.
Methods: The study was carried out during 2020-2022 in a rehabilitation center. 52 patients with cerebrovascular disease (group I) were examined. The mean age of the patients was 62.5±2.2 years. As a control, 30 persons of the same age without signs of CVD were examined (Group II). Creativity function was assessed using the Torrance Test of Creative Thinking. Overall cognitive function was assessed using the MMSE. Statistical processing was performed using Statistica 14.0 software.
Results: It was found that in patients with CVD, fluency subscales significantly decreased. Flexibility, Originality and Elaboration. The total score was 78.5±2.4 points in group I, and 93.3±3.7 points in group II (p<0.05). When assessed by MMSE, there were no significant differences between the groups (24.7±0.6 vs 24.0±0.9 scores, p>0.05)
Conclusions: Patients with CVD have a pronounced decrease in cognitive creativity
Disclosure of interest: No

2019

Prevalence of clinical characteristics, neuroimaging findings and outcomes in patients with CAA: a prospective five-year study

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Background and aims: There are scarce data regarding clinical and neuroimaging manifestations of Cerebral Amyloid Angiopathy (CAA) in Greece. We sought to assess the prevalence of demographics, clinical and radiological findings as well as outcomes among patients with CAA, during a prospective 5-year study.
Methods: A total of 65 patients fulfilling the Boston Criteria v1.5 for probable/possible diagnosis of CAA were enrolled into a prospective

cohort study and followed for a 12-month period. Magnetic Resonance Imaging was used to assess specific neuroimaging markers. Multiple logistic regression analysis was performed to identify predictors of clinical phenotypes and recurrent intracerebral hemorrhage (ICH).
Results: Focal neurological deficits (75%), cognitive decline (57%) and transient focal neurological episodes (TFNEs; 23%) were the most common clinical manifestations. Hemorrhagic lesions, including lobar cerebral microbleeds (CMBs; 92%), cortical superficial siderosis (cSS; 47%) and lobar hemorrhage (41%), as well as non-hemorrhagic markers including multispot white-matter-hyperintensities (54%) and enlarged perivascular spaces in centrum semiovale (51%) were the most prevalent neuroimaging findings. In multivariable analyses adjusting for potential confounders, cSS was independently associated with the likelihood of TFNEs at presentation (OR:4.504, 95%CI: 1.258-19.088) while multiple (>10) lobar CMBs were independently related to cognitive decline at presentation (OR:5.418, 95%CI:1.316-28.497). cSS emerged as the sole independent predictor for ICH recurrence (OR:4.846, 95%CI:1.381-20.314).
Conclusions: cSS was independently associated with TFNEs at presentation and ICH recurrence, while higher burden of lobar CMBs with cognitive decline. These findings highlight the prognostic value of neuroimaging markers, which may influence clinical decision-making.
Disclosure of interest: No

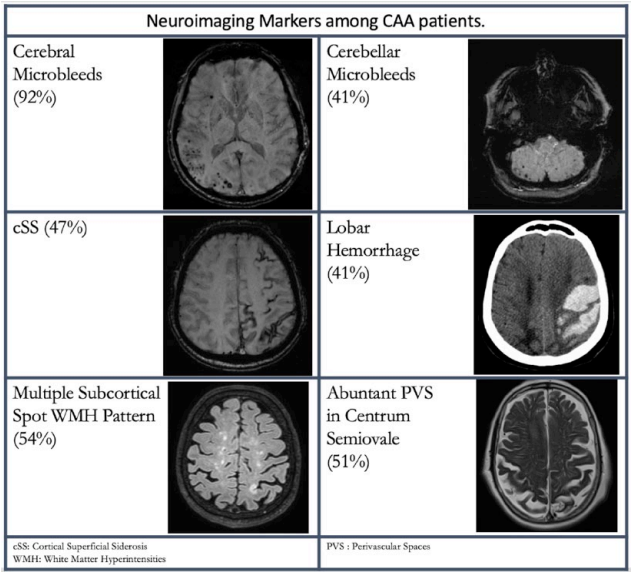

Figure. Neuroimaging findings in CAA.

2251

Early increase in ischemic burden after ischemic stroke presumably related to cerebral small vessel disease

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Background and aims: The risk of recurrent ischemic stroke after an acute ischemic stroke presumably related to cerebral small vessel disease (IS-cSVD) is approximately 2%/year. We sought to assess more globally the increase in clinico-radiological ischemic burden within 6 months of IS-cSVD.
Methods: DHU-LAC is an ongoing French cohort study aimed at delineating the clinico-radiological evolution of 500 patients with IS-cSVD. Patients without dementia or disability within 15 days of IS-cSVD (confirmed by MRI) and willing to participate are recruited in one of the 3 participating centers. Secondary prevention follows current international guidelines. Patients are systematically reassessed at 6 months, clinically and with brain MRI including 3DT1 and 3DFLAIR (FU-MRI), read according to STRIVE criteria. We identified patients with an increased ischemic burden (recurrent ischemic stroke before reevaluation, or presence on FU-MRI of an incident lesion on diffusion or a new lacune).
Results: The first data from 111 patients already reevaluated after 7.4±2.5 months were analyzed. Patients were 63±13 years old (28% female). Sixteen (14%) had an increased ischemic burden at 6 months (3 had a recurrent ischemic stroke; on FU-MRI, 2 had an incident lesion on diffusion and 12 had at least 1 new lacune - 1 had both a recurrent stroke and a new lacune in 2 distinct territories).
Conclusions: One in six patients with IS-cSVD has evidence of early clinico-radiological progression 6 months after the index stroke. Whether increased ischemic burden is a better target than stroke for future therapeutic trials will require further study.
Disclosure of interest: No

2303

AURORA: DUTCH-TYPE HEREDITARY CEREBRAL AMYLOID ANGIOPATHY NATURAL HISTORY STUDY

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Background and aims: Dutch-type hereditary cerebral amyloid angiopathy (D-CAA) is an autosomal dominant form of cerebral amyloid angiopathy (CAA) caused by a mutation in the amyloid-beta (Aβ) precursor protein gene. Because of pathological and biochemical similarities, D-CAA is considered to be a monogenic model for sporadic CAA (sCAA). Though the disease course varies widely, disease onset is approximately 20 years earlier in D-CAA than in sCAA patients. This wide variation in phenotype suggests that additional systemic factors may interact with amyloid in triggering intracerebral hemorrhage (ICH). The aim of this prospective follow-up study is to investigate the (pre)symptomatic disease course and to assess clinical risk factors and biomarkers of disease progression.
Methods: In all patients, 3T-MRI and 7T-MRI at baseline and follow-up (alternating years) will be performed over a period of 6 years. The standardized annual study protocol consists of an interview (general health and vascular risk factors), neurological examination, cognitive screening and blood withdrawal. Participants will be asked for a lumbar puncture each

study visit. Blood and cerebrospinal fluid (CSF) will be stored for future biomarker analysis. Electroencephalography and home blood pressure monitoring will be performed once during follow-up.
Results: Main study parameters: CAA markers on 3T-MRI and 7T-MRI, changes in CSF and plasma, ICH recurrence rate and clinical outcome. We will investigate disease progression in 150 (pre)symptomatic mutation carriers and compare D-CAA patients with the sCAA population (FOCAS study, analogous protocol).
Conclusions: Current status: AURORA started in May 2018, until now 113 patients have been included.
Disclosure of interest: No

2304

Risk factors of early increase in ischemic burden after ischemic stroke presumably related to cerebral small vessel disease

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Background and aims: One in six patients with ischemic stroke presumably related to cerebral small vessel disease (IS-cSVD) has an early increase in ischemic burden (abstract 2251). We sought to identify corresponding risk factors.
Methods: DHU-LAC is an ongoing French cohort study aimed at delineating the clinic-radiological evolution of 500 patients with IS-cSVD. Patients without dementia or disability within 15 days of IS-cSVD (confirmed by MRI) and willing to participate are recruited in one of the 3 participating centers. Secondary prevention follows current international guidelines. Patients are systematically reassessed at 6 months, clinically and with brain MRI including 3DT1 and 3DFLAIR (FU-MRI), read according to STRIVE criteria. We compared, using appropriate methods, vascular risk factors and imaging markers between patients with increased ischemic burden (recurrent ischemic stroke before reevaluation, or presence on FU-MRI of incident lesion on diffusion or lacunes) and those without.
Results: Sixteen of the 111 patients evaluated after 7.4±2.5 months had an increased ischemic burden. They were not older (66±14 vs 63±13 years, p=.9) but more frequently hypertensive (94% vs 59%, p=0.007), diabetic (44% vs 17%, p=0.02), and with a Fazekas score⩾2 (75% vs 42%, p=0.02). They had a higher number of microbleeds (3.5[0-8] vs 0[0-1], p<0.001) and lacunes (4[2-7] vs 0[0-2], p<0.001). All factors remained significant in multivariable analyses.
Conclusions: The risk of early increase in ischemic burden is higher in patients with cardiovascular risk factors and severe radiological cSVD. It remains unclear whether therapeutic approaches to reduce ischemic burden and recurrent stroke differ.
Disclosure of interest: No

2336

FOCAS: FOLLOW-UP IN SPORADIC CEREBRAL AMYLOID ANGIOPATHY STUDY

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Background and aims: The disease course of sporadic Cerebral Amyloid Angiopathy (sCAA) varies widely. Some patients have only one intracerebral hemorrhage (ICH) whereas other experience multiple ICH. The disease course can be characterized by rapid cognitive decline, frequent headaches or seizures whereas in others sCAA has a relatively mild symptomatology. Except for APOE genotype and hypertension, it is unknown which factors affect the disease course. The aim of this prospective follow-up study is to investigate the (pre)symptomatic disease course and to assess clinical risk factors and biomarkers of disease progression.
Methods: In all patients, 3T-MRI and 7T-MRI at baseline and follow-up (alternating years) will be performed over a period of 6 years. The standardized annual study protocol consists of an interview (general health and vascular risk factors), neurological examination, cognitive screening and blood withdrawal. Participants will be asked for a lumbar puncture each study visit. Blood and cerebrospinal fluid (CSF) will be stored for future biomarker analysis. Electroencephalography and home blood pressure monitoring will be performed once during follow-up.
Results: Main study parameters: CAA markers on 3T-MRI and 7T-MRI, changes in CSF and plasma, ICH recurrence rate and clinical outcome. We will investigate disease progression in study participants and compare with a population of (pre)symptomatic Dutch-type hereditary CAA (D-CAA) carriers (AURORA study, analogous protocol).
Conclusions: Current status: FOCAS started in May 2018, until now 67 patients have been included.
Disclosure of interest: No

2364

Psychological impact of strict COVID-19 containment in CADASIL patients

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Background and aims: The most restrictive measures of containment at the beginning of the COVID pandemic were responsible for psychological distress and alteration of quality of life in the general population. We aimed to determine the potential health impact of such an event in a sample of patients from a large cohort study of CADASIL.
Methods: Medical and psychological data were collected through personal interviews both by a psychologist and a physician just at the end of the strict containment. Both cognitive, clinical and psychological information were collected. The frequency of depression and of negative subjective experience of the containment were analysed. Also, the predictors of significant post-traumatic stress manifestations defined as an Impact Event Scale Revised version (IESR) score ⩾ 24 were identified using multivariable logistic analysis.
Results: At the end of containment, only 9% of CADASIL patients were depressed. Only 11 reported a high degree of negative subjective experience of the containment. Thirteen out 135 patients had an IESR score ⩾ 24. Both living alone outside a couple (OR: 7.86 (1.87-38.32), unemployment (OR: 4.73 (1.17-18.70)) and the presence of > 2 children at home (OR: 6.34 (1.35-38.34) were found independently associated with the

occurrence of significant post-traumatic stress manifestations during the containment.
Conclusions: The impact of the containment in a cohort of CADASIL patients was limited. About 10% patients presented with post-traumatic stress manifestations. This was predicted by the degree of isolation and living situation at home of individuals but not by the health status.
Disclosure of interest: No

2426

Parasympathetic System Impairment Is Associated with Cerebral Microangiopathy in Adults with Sickle Cell Disease

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Background and aims: White matter lesions (WML) on brain imaging are common both in children and adults with sickle cell disease (SCD). The autonomic nervous system (ANS) is involved in the homeostasis of cerebral hemodynamics. The aim of this study was to evaluate the association between ANS parameters and cerebral microangiopathy in adult patients with SCD.
Methods: We prospectively assessed adult patients with SCD from our cohort for baroreflex sensitivity (BRS), sympatho-vagal balance (High Frequency HF, Low Frequency LF, LH/HF ratio). These patients also had cerebral MRI. Patients with history of stroke were excluded.
Results: Forty-one patients (F/M:25/16) were included. Median age was 37.5 years (range 19-65). Twenty-nine (70,7%) patients had SS genotype. Among the 41 patients included, 11 patients had cerebral microangiopathy (26,8%). Patients with cerebral microangiopathy were significantly older (44.5 vs 30.6 years; $p < 0.001$) and had lower power in the High Frequency range (HF 157 ms^2 vs HF 467.6 ms^2; $p < 0.005$). Cerebral blood flow velocities in the MCA did not significantly differ between the two groups (105.3 vs 115.5 cm/sec; p=0.381).
The AUC for the model with age as a single predictor was of 0.876. For the age and HF model, the AUC was of 0,946.
Conclusions: Our study suggests that lower parasympathetic activity is associated with cerebral microangiopathy in adults with sickle cell disease. Cardiovascular prevention including non-drug treatment and physical activity could improve cerebrovascular function and parasympathetic activity. HF monitoring can help assess the cardiovascular impact of such a treatment in patients with SCD.
Disclosure of interest: No

2460

MicroRNA polymorphism and the risk of Ischemic Stroke: A meta-analysis

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Background and aims: MicroRNAs (miRNAs) can behave as potential biomarkers for stroke diagnosis. They have a significant role in the pathophysiology of ischemic stroke (IS), and their dysregulation can depict disease risk in individuals
Methods: A comprehensive literature search was performed in various electronic databases, including PubMed, Embase, Cochrane Library, CINAHL, and Google Scholar up to 10th January 2023. Pooled Odds Ratios (ORs) with 95% Confidence Intervals (CIs) helped determine the association. Sensitivity analysis and meta-regression were performed to detect the heterogeneity between studies, and Begg's funnel plot assessed any publication biases.
Results: We identified 25 case-control studies with 10536 IS patients and 13631 control subjects, involving 21 Asian and 4 Caucasian population studies. Our findings indicated a significant association between the polymorphisms of miR-146a, miR-149, miR-196a2, miR-499, and miR-126 in the recessive model and the risk of IS. Only miR-499 and miR-126 possessed risk association with IS in all the genetic models. While, miR-146a, miR-149, and miR-196a2 showed protective association with IS risk in the dominant model. The heterozygote model of miR-146a polymorphism also correlated with protective association IS risk. Subgroup analysis depicted a significant risk association of miR-146a in the Asian and Caucasian populations in the recessive model.
Conclusions: The results indicated a significant risk association of miR-146a, miR-149, miR-196a2, miR-499, and miR-126 polymorphisms with ischemic stroke. MiRNA polymorphisms can become potential biomarkers for IS diagnosis through large-scale clinical trials
Disclosure of interest: No

2512

Spontaneous vasomotion decreases with age in the APP23 mouse model of cerebral amyloid angiopathy

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Background and aims: Cerebral amyloid angiopathy (CAA) is a leading cause of intracerebral hemorrhage in the elderly. CAA involves deposition of amyloid-β (Aβ) in the leptomeningeal and cortical vasculature, a pattern which may reflect impairments in perivascular Aβ clearance. Recent studies have suggested that spontaneous vasomotion, low frequency (~0.1 Hz) oscillations in arterial diameter, is an important driver of perivascular clearance (van Veluw 2020). We aimed to examine spontaneous vasomotion with early Aβ deposition in the APP23 mouse model of CAA, a model associated with spontaneous microbleeds.
Methods: We used awake, in-vivo, two-photon microscopy to track individual blood vessels longitudinally. Briefly, chronic cranial windows and headposts were implanted in APP23 transgenic mice and wildtype littermates (n=4,4), and the same vessels in each mouse were imaged monthly from 7-12 months of age.
Results: Aβ deposition was observed in the walls of pial arteries starting at ~8-10 months of age in transgenic mice. Vasomotion significantly declined with age in transgenic mice and remained intact in wildtypes, an effect driven by age*genotype interactions and not by % Aβ coverage in the imaged vessel. In some vessels, vasomotion impairments preceded local Aβ deposition.
Conclusions: Our findings demonstrate age-related impairments in vasomotion in APP23 Tg mice and suggest that impairments are driven not only by local Aβ deposition. We hypothesize that initial Aβ deposition

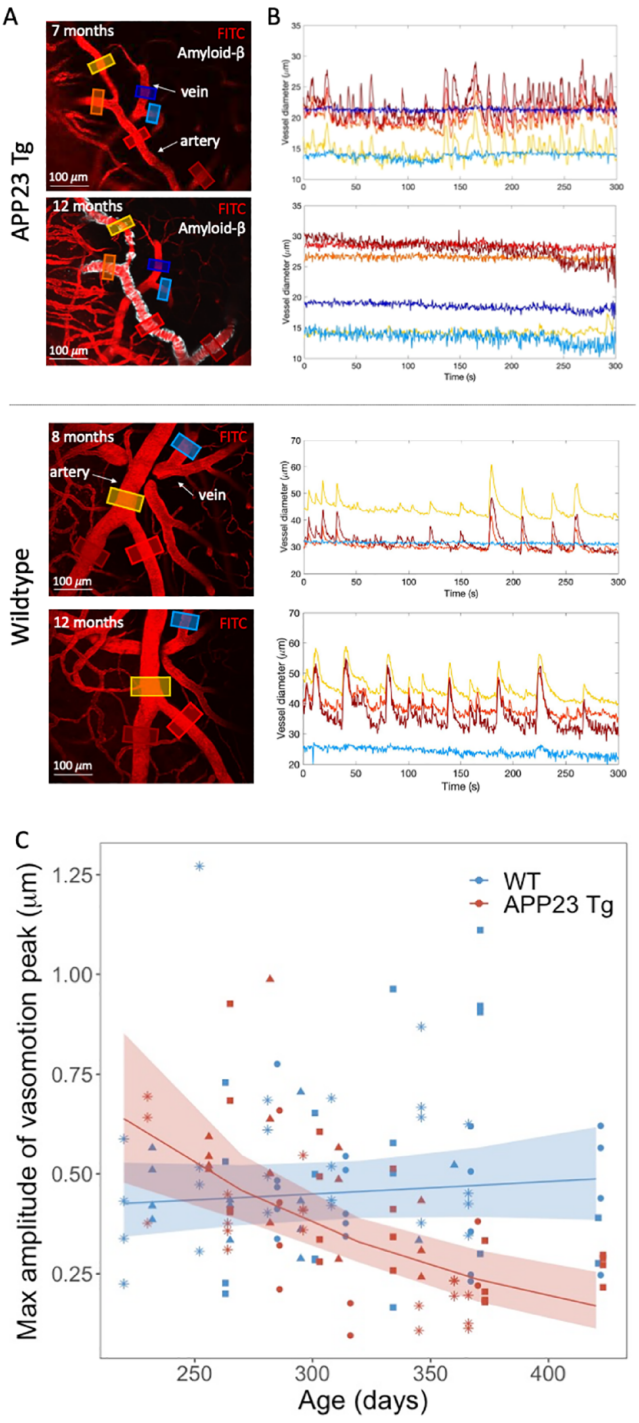

Figure 1. Vasomotion declines with age in APP23 transgenic (Tg) mice.
A) Representative imaging field of view from APP23 Tg mouse and wildtype (WT) mouse imaged longitudinally. Pial artery in Tg mouse with evidence of Aβ accumulation with age. B) Timecourses from ROIs shown in A. In the first imaging sessions, arteries in both the Tg and WT mice exhibit low frequency oscillations in vessel diameter consistent with spontaneous vasomotion (not present in veins within same field of view). These oscillations remain in the WT mouse at 12 months of age but are no longer present in the APP23 Tg mouse at 12 months. C) Maximum amplitude of the vasomotion peak in the frequency domain for each imaged field of view at multiple time points (each symbol represents an individual mouse). Curves depict linear mixed effects model predictions for WT and Tg mice (model built with fixed effects = % CAA coverage, age, genotype, age*genotype interaction | random effects = mouse, vessel), shaded areas represent 95% confidence intervals. Significant negative associations were observed between genotype and vasomotion peak ($p < 0.001$) and between age*genotype interaction and vasomotion peak ($p < 0.001$). N = 4 WT, 4 Tg mice.

within a vascular network may lead to widespread changes in vascular function, including smooth muscle cell dysfunction. These early impairments in vasomotion may be an important future therapeutic target in CAA.

Disclosure of interest: No

2586

THE AGREEMENT BETWEEN TWO CARBON DIOXIDE CONCENTRATIONS TO ASSESS CEREBROVASCULAR REACTIVTY IN PATIENTS WITH CEREBRAL SMALL VESSEL DISEASE

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Background and aims: Methods are needed to accurately assess and monitor cerebrovascular health and function in patients with cerebral small vessel disease (CSVD). Agreement between two different carbon dioxide (CO_2) concentrations (4% and 6% CO2) to estimate cerebrovascular reactivity (CVR) and the differences in calculating CVR with physiological measurements using absolute changes or percent changes were determined.

Methods: 75 patients with CSVD had CVR assessments with 2 minutes of 4% and 6% CO_2 mixed with medical air. Physiological recordings included cerebral blood flow velocity (CBFV, $cm.s^{-1}$) measured in the middle cerebral arteries and end-tidal CO_2 ($etCO_2$, %). Differences in values at baseline and at end of each CO_2 exposure in CBFV parameters and $etCO_2$ were calculated in absolute and percent changes. Wilcoxon test ($p<0.05$) and intraclass correlation coefficient (ICC) determined agreements between methods.

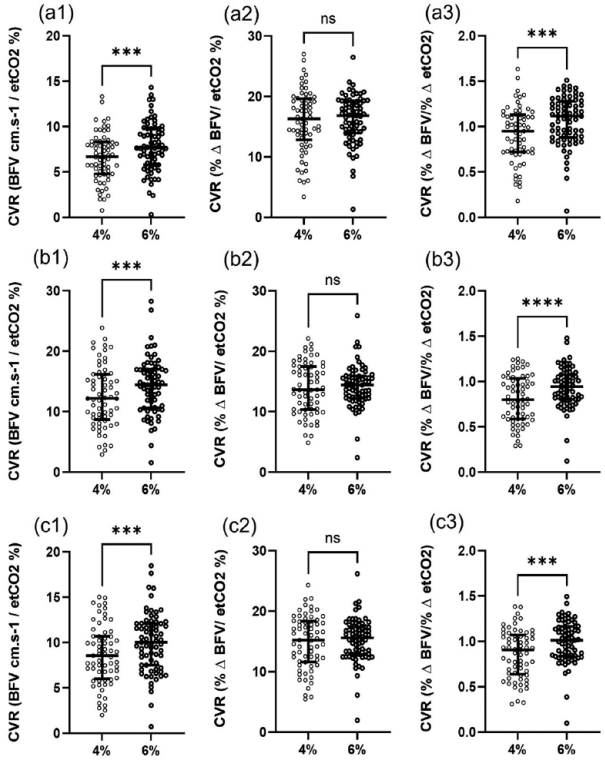

Fig. 1. CVR changes of CBFV (a, EDV; b, PSV; c, MFV) and $etCO_2$ with exposure to 4% or 6% CO_2 when calculated by absolute/percent change.

Results: Fig.1 shows the 64 participants (17% females, aged 69±8 years) with differences in CVR (median, IQR) when changes were calculated using Abs/Abs or Perc/Perc. ICC values (Fig.2) had excellent reproducibility when Abs/Abs was used for CVR with PSV, good reproducibility with other CVR estimates.
Conclusions: In CSVD patients, CVR estimates using 4%/6% CO_2 have good agreement. Perc/Abs provided less differences between the two CVR methods but using Abs/Abs changes had better agreement when CVR was assessed with PSV.

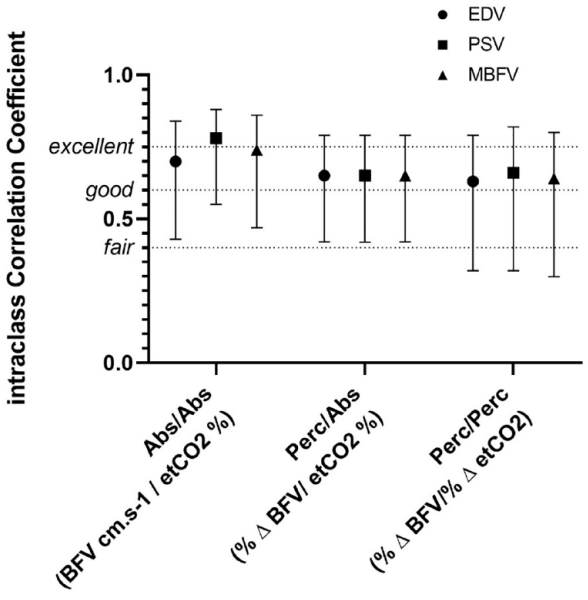

Fig.2. Agreement in CVR estimates assessed with 4% and 6% CO_2.

Disclosure of interest: No

SEX, GENDER AND STROKE

1051

Sex differences in the follow-up of stroke patients in a tele-stroke network

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Background and aims: The evolution of stroke is different according to sex, being one of the main causes of death in women. It has not yet been clarified if this difference is due to gender dimorphism or to treatment and management discrepancies. We investigated whether stroke women are attended in a similar way than men in the follow-up in a tele-stroke network.
Methods: A prospective registry of ischemic strokes attended by the Andalusian tele-stroke network (CATI) was analyzed focusing on sex differences. Demographic, clinical characteristics and treatment data were collected. Functional outcomes were evaluated using mRS at 90 days. Visits and tests performed in the follow-up were also collected.
Results: 3009 suspected stroke patients were attended in the last three years. 42.74% were women. 69.54% of men and 63.85% of women were ischemic strokes (p=0.002). Women were older (p>0.001) and less independent (p=0.006) than men. There was no difference in the treatment received and neither in the treatment intervals between groups. Importantly, there was no difference in mRS at 3 months between sexes. At follow-up, women had fewer imaging tests (p = 0.018) and fewer outpatient visits (p<0.001) than men.
Conclusions: No significant difference between men and women has been found in the acute treatment of stroke in a large tele-stroke network. However, the same is not true for the follow-up and management of patients after the acute phase. This fact supports that strict adherence to protocols, training, and specialization of care avoids sex differences by providing equal attention.
Disclosure of interest: No

1258

Sex-specific impact of arterial stiffness on the outcome after ischemic stroke

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Background and aims: Arterial stiffness (AS) is an independent predictor of cardiovascular events and associated with a poor prognosis. While AS may represent a novel therapeutic target, recent evidence showed that it is sexually dimorphic. Aim of this study was to evaluate sex differences in AS prevalence and their possible impact on the outcome of acute ischemic stroke.
Methods: We retrospectively evaluated a cohort of 334 patients (176 males, 158 females) with acute ischemic stroke who underwent 24-h blood pressure in-hospital monitoring. The following parameters were evaluated: systolic blood pressure, diastolic blood pressure, mean blood pressure, pulse pressure and arterial stiffness index (ASI).
Results: ASI was similar in women and men but there was a significant sex-dependent impact of ASI on 90-day unfavourable Rankin score as only men had a reduced likelihood of favourable outcome with increasing arterial stiffness (OR:1.54, 95%CI:1.06–2.23; P-interaction=0.023).
Conclusions: The influence of ASI on 3-month functional outcome after acute ischemic stroke is mediated by sex, suggesting that only in males higher ASI values are correlated with a worse outcome.
Disclosure of interest: No

PATHOPHYSIOLOGY OF STROKE / TRANSLATIONAL MEDICINE

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PROTECTIVE EFFECT OF DECANOIC ACID IN ISCHEMIA REPERFUSION INJURY IN MIDDLE CEREBRAL ARTERY OCCLUSION MODEL OF STROKE IN RATS

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Background and aims: AMPA is an ionotropic transmembrane receptor for glutamate. Studies have reported that AMPA receptor blockers prevent neurological damage and enhance the post stroke recovery in rats. Decanoic acid showed non-competitive AMPA receptor antagonism at therapeutic concentrations. Present study was planned to investigate the effect of AMPA receptor modulation by blocking them in an animal model of stroke in rats. The effects of decanoic acid administration before and after ischemia reperfusion injury on neurological damage and post stroke recovery were analyzed.
Methods: Middle cerebral artery occlusion (MCAo) was done by using the intraluminal method in the rats to induce focal cerebral ischemia. Decanoic acid (120 mg/kg) was administered orally one day before and immediately after ischemia reperfusion injury. Effect on neurological damage and post stroke recovery was assessed by neurobehavioral parameters, MRI, TTC staining, inflammatory, oxidative, apoptotic and neuroprotective biomarkers.
Results: Decanoic acid significantly reduced the MCAo induced neurological damage and infarct size in MRI and TTC staining study ($p<0.001$). Decanoic acid treatment increased the motor coordination and grip strength as compared to MCAo group. Furthermore, levels of inflammatory (TNFα, IL-1β and IL-6), oxidative stress (MDA), apoptotic (TUNEL positive cells) and neurological injury (GFAP) biomarkers were reduced after decanoic acid treatment ($p<0.001$). Anti-inflammatory cytokine (IL-10) and neuroprotective markers (BDNF and TrKb) were significantly ($p<0.001$) increased with decanoic acid treatment.
Conclusions: This study showed the neuroprotective effects of decanoic acid against ischemia reperfusion injury in rats via anti-inflammatory, anti-oxidant, neuroprotective and anti-apoptotic effects in ischemia reperfusion injury in rats
Disclosure of interest: No

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SHEAR-ACTIVATED NANOTHERAPEUTICS WITH NITROGLYCERIN TO SELECTIVELY INCREASE LEPTOMENINGEAL COLLATERAL BLOOD FLOW DURING ISCHAEMIC STROKE

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Background and aims: We have shown in experimental stroke, collaterals have fluid shear stress that is 3-7 times higher (100 dyne/cm2) than systemic vessels. This unique feature provides a novel way to selectively deliver vasodilators to collaterals, using nanoparticle aggregates, containing nitroglycerin (NG-NPAs), that only release drug in areas of high shear-stress.
We aim to:
Confirm the efficacy of NG-NPAs in dilating collateral vessels and enhancing perfusion during stroke.
Determine the effect of NG-NPAs on cerebral vein diameter and intracranial pressure (ICP)
Methods: Middle cerebral artery occlusion (MCAo) was induced for 70 min in male hypertensive rats (n=26). Laser speckle contrast imaging was used to measure collateral perfusion and cerebral vein diameter. ICP was measured before and during drug/control infusion. Brain injury was assessed at 24 h. 1, 2: Animals were randomized to receive blank-NPAs (control) or NG-NPAs (4μg/kg/min of NG) I.V., 25 minutes after MCAo.
Results: 1: NG-NPAs significantly increased collateral perfusion by 44% vs. 11% for B-NPAs at 40 minutes post-infusion (p=0.026), without reducing blood pressure (NG-NPAs: 161 mmHg, B-NPAs: 163 mmHg, p=0.99). NG-NPAs significantly reduced infarct volume at 24 hours (NG-NPA: 70 mm3, B-NPAs: 121 mm3, p=0.005). 2. NG-NPAs had no statistically significant effect on vein diameter at 40 minutes post-infusion ($p>0.9$) and did not affect ICP (p=0.48).
Conclusions: Shear-activated nanoparticles selectively enhanced collateral perfusion and resulted in smaller infarcts at 24 hours. Our innovative nanoparticle therapy may provide an accurate and effective way of artificially enhancing collateral perfusion.
Disclosure of interest: No

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Endovascular stem cell therapy following Ischemic stroke promotes Sirtuin-1 mediated mitochondrial transfer, protection and biogenesis

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Background and aims: One of the detrimental consequences of ischemic stroke is the mitochondrial dysfunction. Mitochondria are highly vulnerable to damage post-stroke,hence, the need of the hour is to search for agents which can limit the stroke outcomes. Stem cell therapy for stroke is promising as both preclinical and clinical studies have shown beneficial outcomes. We aim to investigate the involvement of sirtuin 1(SIRT1) and its downstream mechanism in modulating the mitochondrial protective effects of stem cells following its endovascular delivery in animal model.
Methods: Ovariectomized Sprague Dawley rats were intraarterially (IA) infused with $1*10^5$ Mesenchymal stem cells (MSCs) at 6 h post-MCAo. Following 24 h of MCAo, animals were evaluated for functional and behavioral outcomes. Brains were harvested for molecular studies and mitochondrial studies.
Results: Significant improvement in functional and behavioral outcomes and a decrease in infarct size were observed following infusion of MSCs post-stroke. An increase in average neuronal length and viability were also observed. Increased expression of SIRT1, mitochondrial fusion, biogenesis, and tunneling nanotube markers were observed with a concomitant reduction in the expression of mitochondrial fission markers in the brain cortical regions observed following MSCs treatment. Improvement in mitochondrial bioenergetics was observed post-MSCs infusion.
Conclusions: Results from this study demonstrate for the first time the role of SIRT1 in modulating mitochondrial functionality post-IA MSCs therapy in a rodent model of ischemic stroke. The IA approach for administering MSCs is highly relevant in the present clinical scenario.
Disclosure of interest: Yes

742

ENDOGENOUS TPA FROM CORTICAL NEURONS PROMOTES NEURONAL SURVIVAL AT THE ACUTE PHASE OF EXCITOTOXICITY

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Background and aims: Tissue-type plasminogen activator (tPA) is the only pharmacological treatment for the acute phase of ischemic stroke, but it is also a multifaceted mediator of brain pathophysiology. We have previously shown that exogenous tPA increases the activity of NMDA (N-methyl-D-aspartate) glutamate receptors in both excitatory and inhibitory cortical neurons, potentially leading to increased excitotoxic neuronal death. Our goal here was to determine if endogenous tPA originating from cortical neurons participate in neuronal sensitivity to excitotoxicity.

Methods: We developed an original adeno-associated virus construct, AAV9-pPlat-Cre-GFP, to unmask and/or delete tPA expression in transduced neurons. *In vivo*, AAV9-pPlat-Cre-GFP was injected in both somatosensory cortices of $tPA^{flox+/+}$ (cKO) or $tPA^{flox-/-}$ (WT) mice. After three weeks, excitotoxicity was induced by injecting 2.5 nmoles NMDA in the right somatosensory cortex, and neuronal survival after 1 and 2 hours post-injection was quantified using immunohistochemistry analyses.

Results: Knocking-down the neuronal expression of tPA decreased the total number of neurons (tPA+ or tPA-) after excitotoxicity. Interestingly, in WT mice, the number of tPA expressing neurons decreased in the lesion area, compared to the contralateral side, but to a lesser extent (+45%) than in cKO mice. Moreover, excitotoxicity did not alter the circularity of tPA expressing neurons in WT mice. By contrast, if disabled to express tPA (cKO mice), these specific neurons appeared elongated and less round after excitotoxicity.

Conclusions: We evidence the impact of endogenous neuronal tPA in neuronal survival/morphology at the acute phase of excitotoxicity. We are currently exploring this phenomenon in stroke models.

Disclosure of interest: No

1011

CEREBRAL AUTOREGULATION IN ACUTE ISCHAEMIC AND HAEMORRHAGIC STROKE: ANALYSIS OF VMCA STEP RESPONSE

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Background and aims: Analysis of the step response changes in middle cerebral artery velocity (SRV_{MCA}) to sudden changes in blood pressure offers insight into the dynamic cerebral autoregulation (dCA). Subcomponents of this relationship (including step response changes of resistance area product (SR_{RAP}) and critical closing pressure (SR_{CrCP})) may hold information about physiological changes affecting dCA. Despite this, investigation of these subcomponents has not been performed in stroke. This study compares SRV_{MCA} between healthy controls and patients with stroke. The aim is to establish a clearer understanding of dCA in acute stroke and consider how measurements may be used clinically.

Methods: Retrospective analysis of transcranial Doppler (TCD) data within the Leicester Cerebral Haemodynamics database was performed for healthy controls and patients with either acute ischaemic stroke (AIS) or intracerebral haemorrhage.

Results: 76 healthy controls (median age: 52.5 years [39,67]) and 40 patients with stroke (64.5 years [54.5, 72]) were included. The stroke cohort included 34 AIS (85%), and median NIHSS was 4 [1,6]. Significant differences were identified between disease states for SR_{RAP} ($p=0.002$) and SR_{CrCP} ($p<0.001$) at the start of the step response, Figure 1.

Conclusions: This study demonstrates differences in dCA parameters between healthy controls and patients with acute stroke. Variations are seen early in the V_{CrCP} step response, suggesting alterations in artery structure, rather than active metabolic or myogenic causes. Further investigation of the impact of early cerebrovascular tone changes are needed, with consideration for the clinical benefits of identifying specific interventions targeting vessel tone as opposed to resistance.

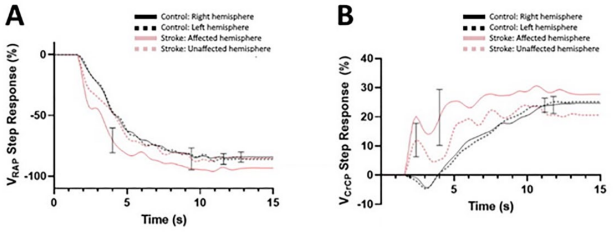

Figure 1. SRRAP (A) and SRCrCP (B) for patients with acute stroke and healthy controls. Greater early variation is seen in SRCrCP (cerebrovascular tone) as opposed to SRRAP (cerebrovascular resistance), demonstrating a change in blood flow distribution by influencing the cerebral vascular network and cerebral autoregulation. Blood pressure lowering agents affecting tone as opposed to resistance may be preferential. Error bars correspond to the largest 1 SE at the time of occurrence.

Disclosure of interest: No

1199

Relationship between reticulated platelet fraction and ex vivo aspirin responsiveness in the early and late phases after transient ischaemic attack or ischaemic stroke

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Background and aims: Reticulated Platelets (RP), young platelets recently released into circulation, may contribute to High on-Treatment Platelet Reactivity (HTPR). Data in TIA/ischaemic stroke patients are limited.

Assess relationship between %RP fraction (%RPF) and *ex vivo* Aspirin-HTPR status under high and low shear stress conditions after TIA/ischaemic stroke.

Methods: Data from two prospective observational studies were collated on %RPF in TIA/ischaemic stroke patients at 14±7days (**14d**,

N=141) and ⩾90 days (**90d**, N=68) on Aspirin alone or in combination with Dipyridamole or Clopidogrel using 'automated assay' (Sysmex XE-2100™/XN-9100™). Aspirin-HTPR at moderately-high shear stress was defined as 'closure times' ⩾176s on PFA-100® Collagen-Epinephrine (C-EPI) assays; at low shear stress as 'Aspirin Reaction Units (ARU)' ⩾550 on VerifyNow® Aspirin assays. We compared unadjusted median %RPF between patients with *vs*. without Aspirin-HTPR; Spearman rank correlation assessed relationship between %RPF and platelet reactivity.

Results: Prevalence of Aspirin-HTPR at 14d-90d, respectively, was 45.1%-33.8% on PFA-100, and 4.4%-12.3% on VerifyNow. Patients with *vs*. without HTPR on PFA-100, %RPF was not significantly higher at 14d (3.15 *vs*. 2.8%, P=0.2), but was higher at 90d (3.6 *vs*. 2.1%, **P=0.002**). There was a **negative** correlation between %RPF and PFA-100 closure times at 90d **(Spearman-ρ=-0.267; P=0.036).** There were no significant differences in %RPF between groups based on VerifyNow HTPR status (P⩾0.5).

Conclusions: Reticulated platelets contribute to Aspirin-HTPR status at high but not low shear stress conditions in the late phase after TIA/ischaemic stroke. Quantifying %RPF has potential to inform personalised antiplatelet therapy in this patient population.

Disclosure of interest: No

1348

NEUROPROTECTIVE EFFECT OF REMOTE ISCHEMIC PERCONDITIONING AND POSTCONDITIONING IN A PRECLINICAL MOUSE MODEL OF ACUTE ISCHEMIC STROKE

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Background and aims: Remote ischemic conditioning (RIC) is an endogenous procedure that reduces ischaemic injury by repeated transient mechanical obstruction of vessels at a remote limb from the injury site. It represents a new paradigm in neuroprotection with unknown mechanism of action. This study aimed to evaluate the neuroprotective effect of RIC in a preclinical mouse model of acute ischemic stroke.

Methods: A mouse model of transient focal cerebral ischemia by compressing the distal middle cerebral artery for 60 min was used. Animals were classified into: Stroke group (MCAO), Stroke+RIPerC group (RIC during MCAO) and Stroke+RIPostC group (RIC after MCAO). RIC consisted of 3 x 5 min cycles of right hind limb ischemia. Infarct volume, functional neurological score and histological examination were evaluated 72h after reperfusion. Multiple inflammatory cytokines in the peripheral blood were measured using a Multiplex Assay. The RIC-specific metabolic response was assessed in plasma and brain tissue using non-targeted LC-MS metabolomics. Light-sheet fluorescence microscopy technique was used to determine the effects of RIC on the microvascular network.

Results: RIPerC and RIPostC significantly reduced the infarction size, improved neurological function and showed a specific cellular pattern and morphological profile in the peri-infarct region, ultimately leading to cerebral ischemia tolerance. Moreover, each RIC strategy showed a specific time-dependent cytokine profile, a metabolic profile and affected the brain vasculature and neurogenesis.

Conclusions: Our results suggest that both strategies may be used as a novel neuroprotective strategy against ischemia injury.

Disclosure of interest: No

1518

MATRIX METALLOPROTEINASE-9 (MMP-9) IS EXPRESSED AT LOWER LEVELS THAN MATRIX METALLOPROTEINASE-2 (MMP-2) IN ACUTE ISCHEMIC STROKE (AIS) CLOTS, BUT EXPRESSION IS INCREASED BY THROMBOLYTIC TREATMENT

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Background and aims: MMP-2 and MMP-9 have been implicated in the breakdown of the Blood Brain Barrier following an acute ischemic stroke. MMP-2 is secreted by platelets and is involved in platelet aggregation. Furthermore, MMP-2 is known to activate MMP-9. The aim was to investigate MMP-2 and MMP-9 expression in AIS clots and to determine any effect of thrombolytic treatment.

Methods: 59 AIS clots were studied (23 cases treated with tissue plasminogen activator (tPA), 36 untreated). Immunohistochemical staining (MMP-2, MMP-9 and CD42b (platelets)) was performed on 3μm sections. Quantification analysis to determine percentage expression was performed. Data were analysed using non-parametric Mann-Whitney U-test and Pearson correlation analysis.

Results: MMP-2 was expressed at significantly higher levels than MMP-9 in AIS clots (Table 1; $p<0.0001$, U=175), this is consistent with reported levels in plasma. MMP-2 expression was mainly in platelet-rich areas, and there was a significant positive correlation between MMP-2 and CD42b expression ($R^2=0.3434$, $p<0.0001$). No significant difference in expression levels for MMP-2 was observed with tPA treatment; however, MMP-9 expression increased significantly, particularly in white blood cells (Table 2; p=0.027). Further work assessing the functional and clinical significance of these findings is ongoing.

Conclusions: Acknowledgements: Science-Foundation-Ireland/European-Regional-Development-Fund(Grant:13/RC/2073)/Cerenovus.

Table 1.

	n	Median% expression	IQR	Mean(SD)% expression
MMP-2	59	31.15	21.65-42.02	34.66(15.24)
MMP-9	59	9.09	4.70-13.44	10.56(9.45)
CD42b	59	26.73	10.50-40.38	27.82(20.67)

Table 2.

		MMP-2 tPA Y/N			Statistic
Y	23	35.77	27.08-42.47	37.33(14.52)	p=0.175,U=326
N	36	29.33	19.64-41.81	32.91(15.63)	
		MMP-9 tPA Y/N			Statistic
Y	23	10.42	6.20-14.66	14.29(12.53)	p=0.027,U=272
N	36	7.19	3.74-11.72	8.17(5.87)	

Disclosure of interest: No

1531

CHARACTERIZING AN EXPERIMENTAL MODEL OF CEREBRAL VASCULITIS USING MOLECULAR MAGNETIC RESONANCE IMAGING

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Background and aims: Primary cerebral vasculitis is a rare disease characterized by infiltration of immune cells around intracranial blood vessels leading to, multifocal stenoses that cause cerebral ischemia and weakening of the vascular wall that cause intracranial hemorrhage.
We aim to develop an experimental model of cerebral vasculitis and a non-invasive diagnostic tool based on molecular-MRI (magnetic resonance imaging).
Methods: NOD-1 ligand (1 µg) or PBS (control) were intraventricularly injected once a week for 4 weeks in mice (Figure 1a). At day 33, endothelial activation was evaluated using a 7T-MRI (T2*-weighted) combined with microparticles of iron oxide (MPIOs, i.v. 10 µg/mg) targeted against VCAM-1. Brains were stained with haematoxylin and eosin (H&E) for pathophysiological analysis.
Results: Our molecular-MRI strategy revealed endothelial activation induced by NOD-1. Specifically, MPIOs showed robust expression of VCAM-1 at day 33 as compared to controls (Figure 1b). This neuroinflammatory status was correlated with the presence of inflammatory infiltrated cells around brain blood vessels observed by H&E staining (Figure 1c), indicating that NOD-1 might induce a granulomatous-like cerebral vasculitis.
Conclusions: Our results suggest that this NOD-1 model serve as a potential platform for cerebral vasculitis experimental studies. Additionally, the use of molecular-MRI is a sensitive and non-invasive diagnostic tool capable of detecting neuroinflammation and therefore, would allow early diagnosis of cerebral vasculitis.
Disclosure of interest: No

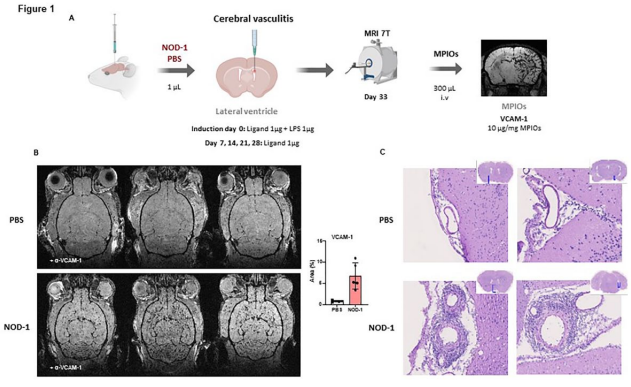

Figure 1. (A) Experimental model of cerebral vasculitis. (B) Representative T2*-weighted images after MPIO@VCAM-1 and quantification of Signal Void areas, (C) representative H&E stained brain sections at day 33 of NOD-1 and PBS treated mice.

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THE ROLE OF SPHINGOSINE-1-PHOSPHATE RECEPTOR 2 IN TREATMENT RESPONSE IN ACUTE ISCHEMIC STROKE

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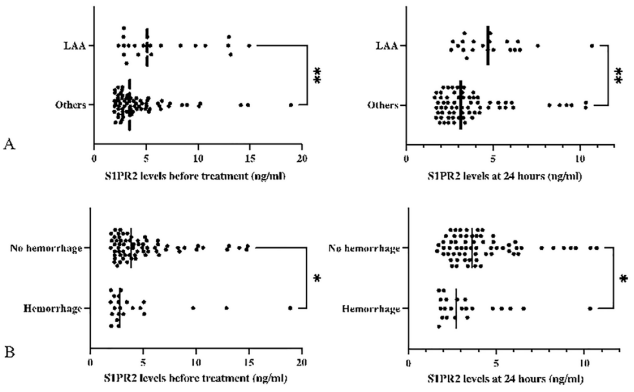
Background and aims: In this study, it was aimed to examine the role of sphingosine-1 phosphate receptor 2 (S1PR2) in the evaluation of treatment response in patients who underwent intravenous thrombolysis (iv tPA) and mechanical thrombectomy.
Methods: 101 patients with acute ischemic stroke were examined. Detailed clinical characteristics of the patients were recorded. Infarct and hemorrhage volumes were calculated from cranial imaging performed at 24 hours. The etiology of stroke was determined according to TOAST classification. Blood samples were taken from the patients before and 24 hours after treatment, and the level of S1PR2 was studied by ELISA.
Results: The levels of S1PR2 before and 24 hours after treatment were found significantly related with large artery atherosclerosis (LAA) (p=0.008, p=0.002), the patients with LAA had higher S1PR2 levels (Figure 1-A). On the contrary, the patients with cardioembolic etiology were found to have lower levels of S1PR2 at 24 hours after treatment (p=0.022). The presence of intracranial hemorrhage after treatment was found to be related with lower S1PR2 levels before and 24 hours after treatment (p=0.041, p=0.025) (Figure 1-B). In subgroup analysis, in patients without successful recanalization after mechanical thrombectomy, S1PR2 levels before and after treatment were significantly high in patients without hemorrhage (p=0.017).
Conclusions: S1PR2 was thought to be associated with disruption of the blood-brain barrier, ischemia-reperfusion injury, and intracranial hemorrhage after acute ischemic stroke. In addition, S1PR2 may have a role in large artery atherosclerosis. Further studies are needed to examine S1PR2 and to elucidate the pathophysiology in detail.



Disclosure of interest: No

1867

Expression of cellular senescence biomarkers points to a role for such an event in the pathogenesis of ischemic stroke

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Background and aims: Aging is a major risk factor for neurological disorders including stroke. Increasing evidence points to accumulation of senescent cells as a major pathogenic mechanism in aging. Therefore, we hypothesize that cellular senescence could be a pathogenic mechanism contributing to the development of stroke-induced brain damage.
Methods: Male Wistar rats underwent 60 min middle cerebral artery occlusion, and were grouped according to the following reperfusion times: 24 h, 3, 7 and 14 days. Changes in metabolic state were studied by senescence-associated β-galactosidase (SA-β-Gal) and lipofuscin staining (Sudan B Black, SBB). Expression of DNA damage, cell cycle and senescence-associated secretory phenotype (SASP) markers were assessed by RT-qPCR.
Results: SBB-positive lipofuscin granules were very scattered at the early stage of 24 h after ischemia-reperfusion (I/R), density increasing along the post-I/R period. A similar pattern was shown as to the expression of SA-β-Gal. Expression of DNA damage markers (Check1, Check2) significantly increased at 7 and 14 days after reperfusion. Similarly, cell cycle markers p16 and p21 showed significant elevation at 7 and 14 days. SASP markers TNF-α and IL-1β were significantly higher at 24 h, decreasing at 3 and 7 days and then increasing at 14 days. All changes in expression were found in the ischemic hemisphere.
Conclusions: These results show the development of brain cell senescence after ischemic injury. Based on our data, the question of whether senescence could be considered as a therapeutic target in the treatment of stroke arises obviously.
Supported by grants RD21/0006/0014(ISCIII), PID2020-119603RB-I00(MICINN) and FEDER funds.
Disclosure of interest: No

1904

ALBUMIN IS HIGHLY EXPRESSED IN A SUBSET OF ACUTE ISCHEMIC STROKE CLOTS AND IS POSITIVELY ASSOCIATED WITH THE SEVERITY OF STROKE

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Background and aims: Studies have shown that low serum level of albumin is an independent predictor of poor functional outcome following Acute Ischemic Stroke (AIS). In plasma, albumin is known to decrease platelet aggregation and has an antithrombotic effect. The aim of this study was to investigate the expression of albumin in AIS clots, its relationship with other clot components and stroke severity (NIHSS).
Methods: A total of 40 representative clot samples were cut into 3 μm-sections and stained with Martius Scarlett Blue (MSB) (10 from each group, RBC-rich, fibrin-rich, platelet/other-rich (one group confirmed as platelet-rich by CD42b and final group confirmed as other, referred to as blue clots)) from the Clotbase international registry. Immunohistochemistry was performed using Anti-Albumin antibody (1:500, ab207327, abcam). The components were quantified via Orbit Image Analysis Software. Non-parametric statistical tests were used.
Results: Albumin expression was significantly higher in blue clots compared to RBC-rich ($p=0.0024^{**}$) and platelet-rich ($p=0.0445^{*}$) but not fibrin-rich ($p=0.2442$) clots. Severe stroke cases (NIHSS$\geq$16) have higher albumin expression in clots compared to mild to moderate cases (NIHSS$<$16) ($p=0.0045^{**}$).
Conclusions: Regions identified as platelet/other-rich on MSB can contain albumin. Blue clots have most albumin content. High albumin expression in AIS clots was associated with severe stroke. Further investigation role of albumin in AIS is warranted.
Acknowledgments: Science Foundation Ireland (SFI)/European Regional Development Fund (Grant 13/RC/2073_P2)/ Sensome
Disclosure of interest: No

1929

EFFECTS OF TEMPERATURE ON NEURONAL FUNCTIONALITY AND NUMBER OF SYNAPSES IN CULTURED HUMAN NEURONAL NETWORKS EXPOSED TO HYPOXIA

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Background and aims: Mild therapeutic hypothermia has been proposed as an effective neuroprotective treatment during and after transient cerebral ischemia. This is based on studies in animal models. However, clinical trials showed divergent results, posing doubt on the effects of hypothermia. Also, working mechanisms of hypothermia treatment remain largely enigmatic. Here, we investigated the effects of hypo- and hyperthermia during hypoxia on neuronal functionality and synaptic connections in human induced pluripotent stem cell (hiPSC)-derived neuronal networks.
Methods: HiPSC-derived neurons were differentiated and cultured on micro-electrode arrays (MEAs) or glass coverslips. Controlled hypoxia proportional to penumbral oxygen levels and target temperatures (normo- (37 °C), hypo- (34 °C), or hyperthermia (39 °C)) were achieved by climate chambers and maintained for 48h. Outcome measures included spontaneous and synchronous neuronal network activity (derived from MEAs) and number of synaptic puncta (derived from microscopic assessment) during and after hypoxia.
Results: Hypothermia-treated neuronal networks showed lower spontaneous and higher synchronous activity during hypoxia than neuronal networks under normothermia. Hyperthermia-treated neuronal networks showed an initial increase in spontaneous and synchronous activity followed by a rapid decrease. After reoxygenation and re-establishment of normothermia, hypothermia-treated neuronal networks showed recovery in spontaneous and synchronous activity; there was no such recovery in untreated or hyperthermia-treated neuronal networks. Recovery after hypothermia was associated with preservation of synapses.

Conclusions: Hypothermia exerts neuroprotection during 48 hours of hypoxia in hiPSC-derived neuronal networks, yielding preservation of electrophysiological neuronal network functioning. Preservation of synapses is a possible protective mechanism. Hyperthermia exerts opposite effects.
Disclosure of interest: No

2045

POSTSTROKE LIPID DROPLET ACCUMULATION IN RESIDING MICROGLIA AND ITS INFLUENCE ON INFLAMMATION

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Background and aims: Ischemic brain damage is a frequent cause for long-lasting disability in patients affected by stroke, and inflammation is a regular bystander. Microglia are critically involved in the aforementioned process, affecting poststroke neurological outcome. Additionally, microglia with lipid droplet (LD) accumulation are dysfunctional in the aged brain and contribute to the worse outcome of neurodegenerative disorders. However, the role of this lipid droplet-rich microglia (LDRM) in cerebral ischemic stroke remains unknown.
Methods: We isolated primary microglia and subsequently detected LD formation in microglia by an in vitro oxygen−glucose deprivation (OGD) model and an in vivo mouse middle cerebral artery occlusion (MCAO) model. The inflammation levels, lipid metabolism-related gene expression and phenotypic polarization and lipid profiles of these microglia were examined.
Results: We observed substantial LD formation in microglia in both in vivo and in vitro hypoxic models. These microglia exhibited high levels of cytokines TNF-α, IL-6, and IL-1β, an M1-like proinflammatory phenotype with a high rate of reactive oxygen species (ROS) level, and high expression of Sterol regulatory element-binding protein 2 (SREBP2), which ultimately activated the NF-κB signaling pathway. Moreover, high expression of SREBP2 upregulated fatty acid synthesis, altering the lipid profile and displaying higher free fatty acid and cholesterol levels. This dysregulation of lipid metabolism further exacerbates neuroinflammation and cellular damage.
Conclusions: Our study elucidates that distinct lipid profiles lead to LD formation, microglia activation, and impaired tissue regeneration in ischemic stroke and result in the conversion of microglia to a pro-inflammatory phenotype.
Disclosure of interest: No

2047

EFFECT OF P53 ACETYLATION AT LYSINES 320 AND 373 ON APOPTOSIS IN CELLS OF PERI-INFARCT AREA AFTER PHOTOTHROMBOSIS

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Background and aims: Posttranslational acetylation of nonhistone proteins can affect their functions. We studied the effect of p53 acetylation at lysine 320 (p53AcK320) and lysine 373 (p53AcK373) on apoptosis of the cells in the perifocal region of photothrombosis in mice.
Methods: Rose Bengal was injected intraperitoneally. The skull was irradiated in the area of the sensorimotor cortex with wavelength 532 nm. Histone acetyltransferases involved in p53 acetylation were determined by co-immunoprecipitation and Duolink PLA. Apoptosis was assessed via the TUNEL method.
Results: PCAFs and, to a lesser extent, p300, but not HAT1, acetyltransferases can acetylate p53 in perifocal cells after photothrombosis. The administration of the PCAF inhibitor plumbagin reduced p53AcK320, but not p53AcK373, and increased cell apoptosis in the perifocal region. Moreover, the effect was more expressed when combined with the administration of cytoplasmic p53 inhibitor pifithrin-α. On the contrary, the administration of the p300 inhibitor embeline reduced p53AcK373, as well as apoptosis in the cells of the perifocal region 3 days after photothrombosis. The coadministration of embeline and a nuclear p53 inhibitor pifithrin-μ, enhanced the antiapoptotic effect of the p300 inhibitor.
Conclusions: Thus, the acetylation of p53 at lysine 320 is more preferably than the acetylation at lysine 320, and, probably, promotes the survival and repair of penumbra neurons after stroke. The strategies, aimed to promote p53AcK320 by increasing the activity of PCAF will be promising for neuroprotective therapy of stroke.
The work was supported by the Russian Science Foundation, grant no. 21-15-00188.
Disclosure of interest: No

2058

ACETYLATION OF C-MYC TEANSCRIPTION FACTOR IN CELLS OF PERI-INFARCT AREA AFTER PHOTOTHROMBOTIC STROKE IN RATS

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Background and aims: c-Myc protein regulates energy metabolism, protein synthesis, oncogenesis, cell cycle, and apoptosis. We studied changes in the level of acetylation of c-Myc at lysines 148 (N-terminal transactivation domain) and 323 (nuclear localization sequence) in perifocal neurons in the first day and early recovery period (7 days) after photothrombotic stroke (PTS).
Methods: After the Rose Bengal administration, the somatosensory cortex was irradiated with a 532 nm laser. Using GPS-PAIL 2.0 and UniProt database, possible acetyltransferases and c-Myc acetylation sites were sought. The acetylation level was assessed by Western-blotting and immunofluorescence microscopy.
Results: Acetyltransferases p300/CBP, PCAF, and GCN5 can acetylate c-Myc at lysines 144/148/158/317/323, 148/323/417, and 32/417, respectively. c-Myc, acetylated at K148 (c-MycAcK148) is contained in the nuclei, but mostly in the cytoplasm of rat brain cortex neurons. Four hours post-PTS, the level of c-MycAcK148 increased in the cytoplasm and after 24 hours exceeded the control level more than twice. In recovery period, c-MycAcC148 content in penumbra cells did not exceed the control values. Unlike c-MycAcK148, c-Myc, acetylated at K323, had predominantly nuclear localization in neurons. Its level did not change following PTS.
Conclusions: Thus, in the first day after PTS, in the cytoplasm of neurons, c-Myc acetylation increases at lysine 148, but not 323, which has a predominantly nuclear localization. However, further studies are needed to establish how c-Myc acetylation at K148 affects the survival and apoptosis of ischemic penumbra cells.
The work was supported by the Russian Science Foundation, grant no. 21-15-00188.
Disclosure of interest: No

2090

ASSESSMENT OF OPEN-FIELD ACTIVITIY AND GAIT IN SWINE MODEL OF SUBARACHNOID HEMORRHAGE

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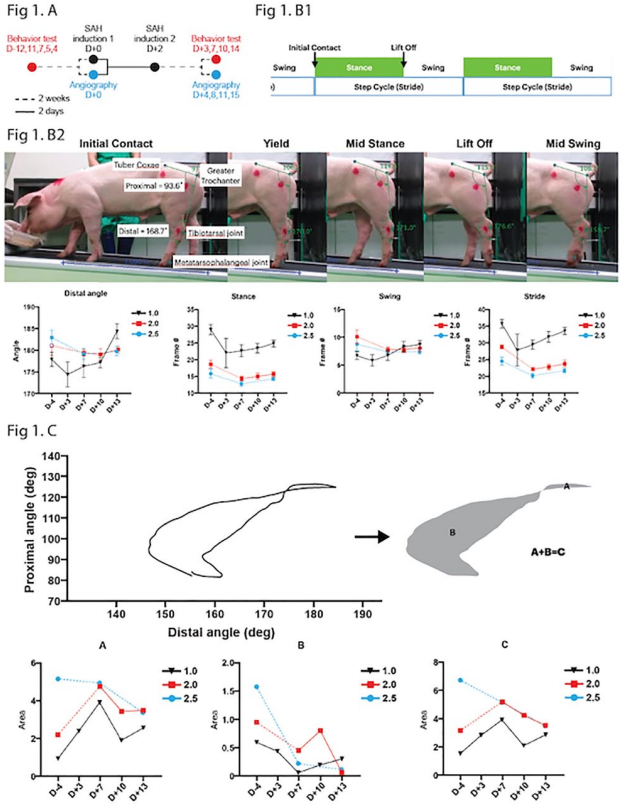
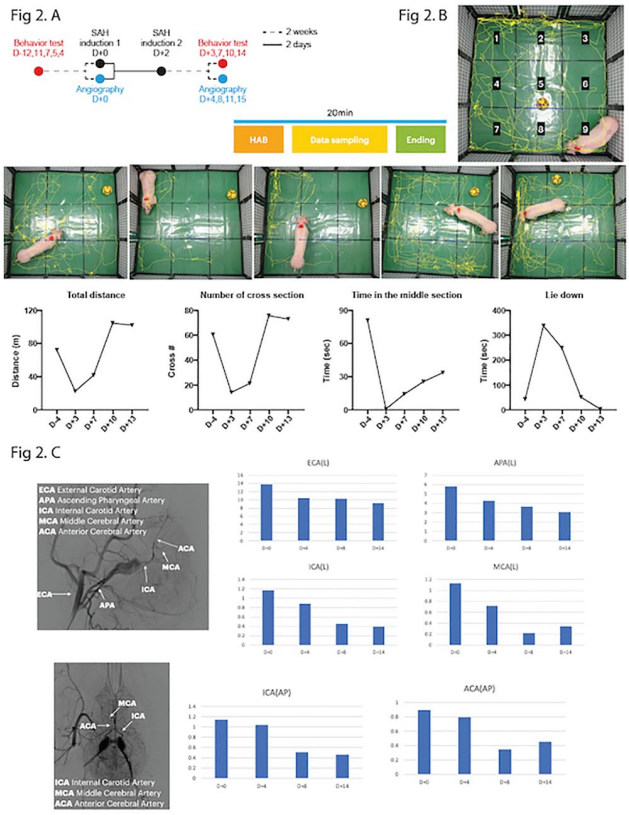
Background and aims: With regard to new drug development, subarachnoid hemorrhage (SAH) is one of the most important target diseases due to a huge burden of global healthcare. Thus, a detailed, meticulous assessment of neurobehavioral functions after SAH is of enormous value. Such tools mostly have been reported in rodent models, but rare in models of large-sized animals. Here, we developed a new assessment method of behavior using open-field test and gait analysis in a swine SAH model.
Methods: SAH model was created using autologous blood injection in 4–5-month-old Swine. After that, SAH detecting test was developed by computerized gait analyzing using a treadmill instead of the previous challenging slope runway to measure precise positions, angle, speed, and balance. An open-field test was performed for two weeks before and after SAH induction which is an intuitively understandable method by creating a Heatmap from recorded animals traces within 20 minutes in a 3x3m blocked area.
Results: As a result of gait analysis, the SAH model had lower gait function than the control group in speed, angle, and consumed time (Before SAH 177.9 ± 1.6°, After SAH 174.4 ± 2.8°). According to Open field test, SAH group showed a tendency that as active time decreased, the area of active state decreased as well.
Conclusions: We successfully established the gaiting and open field test protocols which can detect SAH and neural behavior function. Future research on neuroprotective measures for swine SAH may benefit from these findings.





Disclosure of interest: No

2133

IRON-FREE TRANSFERRIN IMPROVES SENSORY FUNCTION IN AN ANIMAL MODEL OF INTRACEREBRAL HAEMORRHAGE

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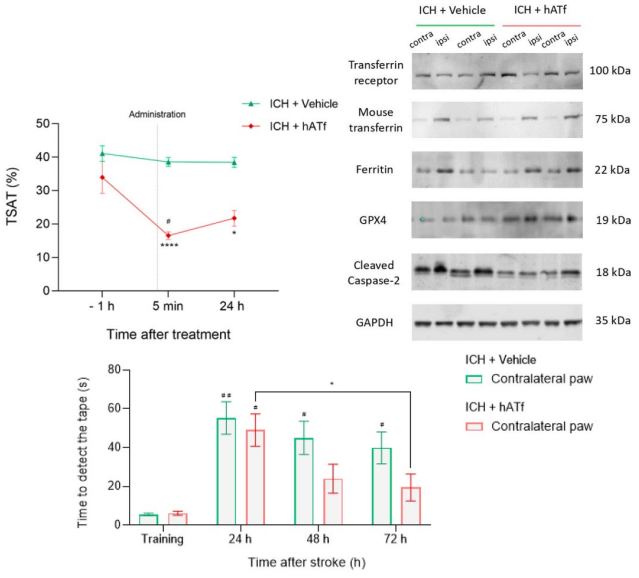
Background and aims: Excess iron is detrimental both in ischaemic stroke (IS) and haemorrhagic stroke/intracerebral haemorrhage (ICH)[PMID:35481263]. We previously demonstrated that the treatment with iron-free transferrin (apotransferrin, ATf) reduces the infarct size and improves the neurological outcome in IS animals by lowering the saturation of blood transferrin with iron (TSAT)[PMID:29248829]. This study aimed to determine the effect of ATf in an ICH mouse model.
Methods: ICH was induced by collagenase injection in the striatum, and vehicle or 230 mg/Kg human ATf (hATf) was administered intravenously 40 minutes later. Body weight and neurological status (rotarod, pole, and tape removal tests) were assessed 24, 48 and 72 hours post-ICH induction. Haemorrhage volume, brain levels of haemoglobin, active caspase-2, and iron-related mRNAs/proteins were measured 72 hours after the treatment.
Results: Collagenase induced striatal haemorrhage, oedema, body weight loss, and impaired performance in neurobehavioral tests. It also increased levels of active caspase-2, ferritin and mouse transferrin mRNA

and protein in the ipsilateral brain hemisphere. Treatment with a single hATf dose reduced blood TSAT for at least 24 hours; the hATf was still present in the brain 72 hours later. Human ATf treatment promoted a progressive sensory neurological improvement in the tape removal test and a reduction of active caspase-2 protein and of endogenous transferrin mRNA/protein in the ipsilateral hemisphere.

Conclusions: The beneficial effect of a single hATf dose shortly after the onset of ICH suggests that ATf might be a pre-hospital frontline safe treatment for IS and ICH before an accurate in-hospital differential diagnostic.



Disclosure of interest: No

2409

A surgical approach to reduce variability after filament MCA occlusion in mice

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Background and aims: The intraluminal filament middle cerebral artery occlusion (fMCAo) model is widely used for preclinical research of ischemic stroke. However, evolving infarct volumes are highly variable, especially in C57BL/6 mice, which often lack the P1 segment of the posterior cerebral artery (PCA) and therefore develop not only MCA but also PCA infarcts after fMCAo. Another factor that contributes to the variability of lesion volume is collateral flow from the pterygopalatine artery (PPA). The aim of this study was to evaluate different surgical techniques able to reduce the variability of infarct volumes in C57BL/6 mice.

Methods: C57BL/6 mice were subjected to 60 min fMCAo and the influence of CCA ligation, PPA ligation, and filament morphology on lesion volume 24 hours after reperfusion were assessed by histopathological analysis.

Results: Using filaments with appropriate coating and ligating the PPA while leaving the CCA unaffected significantly reduced the variability of infarcts.

Conclusions: Using an improved surgical technique to induce MCAo in mice, we were able to produce consistent infarct volumes with reduced variability. Our results may help to increase the reproducibility of the fMCAo model and to decrease the number of animals needed in preclinical stroke research.

Disclosure of interest: No

2578

INTRAPROCEDURAL HYPOTENSION IS ASSOCIATED WITH LARGER INFARCT GROWTH RATE IN PATIENTS WITH EXPONENTIAL GROWTH PATTERNS

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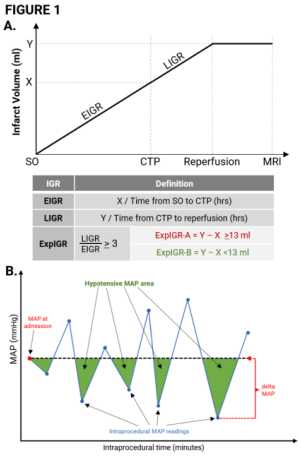
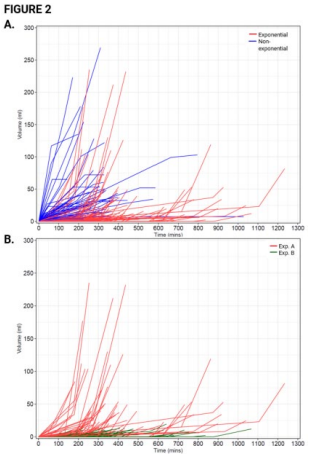
Background and aims: Infarct growth rate (IGR) differs among patients with acute ischemic stroke due to large vessel occlusion (LVO-AIS) and has critical clinical reperfusions. We explore different IGR patterns and its association with blood pressure during endovascular therapy (EVT).

Methods: This retrospective cohort includes anterior circulation LVO-AIS patients who underwent EVT and achieved mTICI 2c-3. We used admission CTP and DWI-MRI ⩽24 hours after EVT to define initial and final infarct volumes (IIV, FIV). We measured early and late IGR (EIGR, LIGR) and determined patterns of IGR as exponential (ExpIGR), and Non-exponential (NonExp). A clinically significant infarct growth increase (FIV – IIV) was stablished with ROC analysis; ExpIGR patients were categorized as ExpIGR-A (⩾13 ml) and ExpIGR-B (<13 ml) **(Figure1A)**. We measured intraprocedural hypotension as delta MAP (dMAP) and hypotensive MAP area (HMA), and hypoperfusion intensity ratio (HIR) for collaterals status **(Figure1B)**. Logistic/linear regression were used to investigate associations between variables.

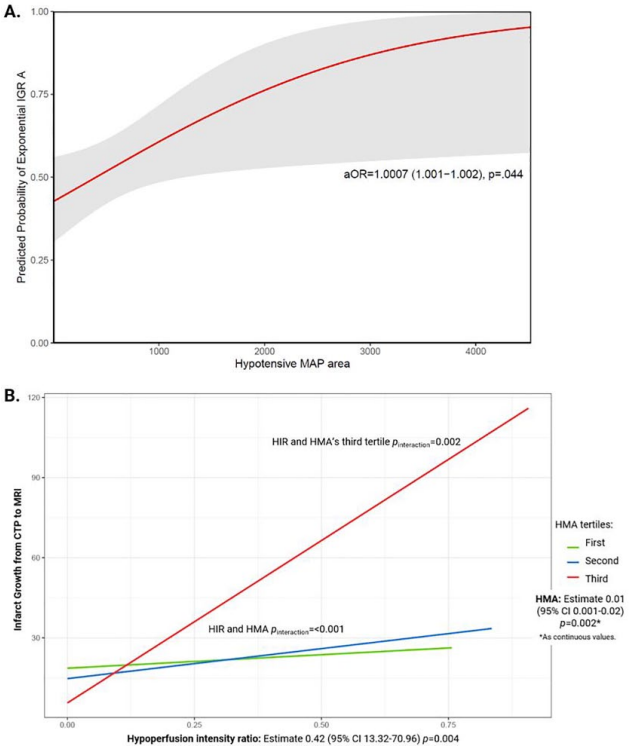
Results: Of 159 TICI 2c-3 patients 36% presented pattern ExpIGR-A, 31% ExpIGR-B, and 33% NonExp **(Figure2)**. HMA was independently associated with ExpIGR-A **(Figure3A)** and had a significant interaction with HIR. Infarct volume increased of ml per 100 units of HMA, and 4.2 ml per 0.1 units of HIR **(Figure3B)** .





Conclusions: Among patients with exponential infarct growth pattern, a subgroup will experience important increases of infarct volume during a late period, despite of showing an initial slow progression. This growth seems to be associated with greater sustained hypotension episodes during EVT.

FIGURE3



Disclosure of interest: No

GENETICS, 'OMICS AND BIOMARKERS

597

A STROKE GENE PANEL: TO DECIPHER THE PATHOGENIC VARIANTS

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Background and aims: Stroke is a complex, multifactorial polygenic disease resulting from the interplay of genetics and environmental factors. Next Generation sequencing (NGS) is a recommended and probable technique in the field of stroke genetics. Determining the variation with higher functional impact on disease risk is a challenging task as sequencing generates millions of reads. Therefore, we designed the stroke gene panel to analyze the enormous and massive data. The imperative genetic information will be contemplated for stroke research determination and for clinical practice.

Methods: We electronically searched the stroke genes in PubMed, Embase, Online Mendelian Inheritance in Man (OMIM) and Google Scholar. The search was done only for human studies with various combinations of central keywords. First, we selected the genes reported by Ilinca et al for Whole Exome Sequencing. Second, we selected the stroke associated positive genes which was reported in at least one paper. Third, we selected the genes present on the strongly associated chromosomal loci of stroke. Repeated genes were excluded from the final stroke gene panel.

Results: In the study, we have considered 470 genes for the stroke gene panel. The first segment of a stroke gene panel (SGP- A) includes 214 genes while second (SGP- B) and third (SGP- C) segment includes 76 and 180 genes respectively.

Conclusions: The designed panel can be used to analyse and interpret the enormous data generated by NGS in upcoming stroke related genetic studies. The panel will also help in assessing the pathogenicity of the novel variants.

Disclosure of interest: No

780

The immunologic phenotype of thrombi is associated with future vascular events after cerebral infarction

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Background and aims: Thrombi retrieved from patients with acute ischemic stroke may contain prognostic information. We investigated the relationship between the immunologic phenotype of thrombi and future vascular events in stroke patients.

Methods: This study included patients with acute ischemic stroke who underwent endovascular thrombectomy at Chung-Ang University Hospital in Seoul, Korea, between February 2017 and January 2020. Laboratory and histological variables were compared between patients with and without recurrent vascular events (RVEs). Kaplan–Meier analysis followed by the Cox proportional hazards model was used to identify factors related to RVE. Receiver operating characteristic (ROC) analysis was conducted to evaluate the performance of the immunologic score by combining immunohistochemical phenotypes to predict RVE.

Results: A total of 48 patients were included in the study with 13 RVEs (mean ± standard deviation age, 72.8 ± 11.1 years; 27 [56.3%] men). Thrombi with a lower percentage of programmed death ligand-1 expression (hazard ratio [HR], 5.25; 95% confidence intervals [CIs], 1.39–19.9), a lower number of high-mobility group box 1 positive cells (HR, 2.92; 95% CIs, 0.86–9.88), and a higher number of citrullinated histone H3 positive cells (HR, 6.23; 95% CIs, 1.32–29.3) were associated with RVE. The immunologic score, which consists of the three immunohistochemical phenotypes, showed good performance in predicting RVE (area under the ROC curve, 0.862; 95% CIs, 0.763–0.960).

Conclusions: The immunological phenotype of thrombi could provide prognostic information after stroke.

Disclosure of interest: No

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NEUROFILAMENT LIGHT CHAIN SERUM CONCENTRATIONS AND RENAL FUNCTIONS IN ACUTE ISCHEMIC STROKE PATIENTS

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Background and aims: Many studies have been recently published about Neurofilament Light chain (NfL) serum concentrations of ischemic stroke patients and its correlation with long-term patients' prognosis. Nevertheless, none of them have addressed so far how renal function may influence NfL levels, being this biomarker primarily eliminated from the body by the kidney. Our aim was to investigate these correlations in stroke patients.
Methods: For this longitudinal prospective observational study, inclusion criteria were: >18y, onset <24h, NIHSS >1, pre-stroke mRS=0-1, stroke at neuroimaging. Exclusion criteria: >80y, TIA, previous stroke/traumatic head injuries, other neurological disease, chronic immunosuppression, eGFR<30mL/min, pregnancy. Patients were treated as standard of care, routine blood tests done upon admission. NfL serum concentrations were determined with Ella Automated Immunoassay System on samples collected within 24h from onset (T0), after 3-5 days (T1) and 7±2 days (T2).
Results: At present, 21 patients have been enrolled (16 males, mean age 61[±17.23]); 66.7% with minor, 23.8% moderate, 9.5% severe stroke. One patient has DM2T, but without renal impairment. Median values were creatinine 0.93 mg/dL (IQR 0.93), eGFR 86 mL/min (IQR31.59), NfL=25 pg/mL (IQR 47). NfL was higher at T2vs.T0 (p=0.006). NfL concentrations positively correlated at every time-points with creatinine (T0 p=0.002; T1 p=0.006; T2 p=0.014) and negatively with eGFR (p<0.001).
Conclusions: Being primarily eliminated by the kidney, these results confirm that NfL serum levels are strictly dependent upon renal function also in ischemic stroke patients and this variable should be considered in future studies as a potential source of bias.
Disclosure of interest: No

1107

THE USEFULNESS OF FACTOR XIII CONCENTRATION ASSESSMENT IN PATIENTS IN THE ACUTE PHASE OF ISCHEMIC STROKE TREATED WITH THROMBOLYSIS

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Background and aims: In recent years, there has been a growing interest in factor XIII in stroke. The study's main aim was to assess the usefulness of factor XIII concentration determination in patients with acute ischemic stroke (AIS) treated with thrombolysis (t-PA).
Methods: The study was conducted in two groups of 84 patients with AIS: group I with thrombolytic therapy and group II without thrombolysis.
A physical examination, neurological status (using National Institutes of Health Stroke Scale, NIHSS), patients' daily activities measured with Barthel Index and Modified Rankin Scale (mRS), and blood tests were carried out on the 1st and 7th day. CRP, fibrinogen, D-dimers, NLR index, and the concentration of factor XIII A in the blood were assessed.
The statistical analysis was performed using the STATISTICA v. 13.3 computer program by TIBCO. p-value < 0.05 was considered statistically significant.
Results: In group I, the concentration of XIII A decreased significantly between 1st and 7th day (p < 0.001). In group I, the concentration of XIII-A on 7th day in TACI was significantly lower than in another stroke. XIII-A concentration in group I was significantly lower with ASTRAL < 31. A greater decrease in XIII-A between the first and second sampling was associated with worse patient's neurological state in I group.
Conclusions: XIII-A concentration decreases after t-PA.
XIII-A concentration in group I with TACI was significantly lower than in another stroke, which is associated with worse prognosis.
A more significant decrease XIII-A was associated with worse condition on 7th day.
Disclosure of interest: No

1195

Aβ 1-40, Aβ 1-42, t-tau and α-synuclein as a putative serological biomarker in Cerebral Amyloid Angiopathy

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Background and aims: Cerebral amyloid angiopathy (CAA) is a cerebrovascular disorder characterized by the deposition of β-amyloid protein within brain blood vessels and just a probable or possible diagnosis can be done in vivo with the Boston Criteria.
The aim of the study is to detect the concentration of serological biomarkers ($A\beta_{1\text{-}40}$, $A\beta_{1\text{-}42}$, t-tau and α-synuclein) in both red blood cells (RBCs) and plasma of CAA patients and cognitively healthy controls (HC), evaluating their role as peripheral biomarkers for CAA.
Methods: A total of 40 participants were examined, 20 CAA patients and 20 HC enrolled from volunteers. Patients and HC were matched for age and sex. All participants underwent a blood sample to quantify proteins' concentrations in RBCs and plasma by immuno-enzymatic assays.
Results: The results highlighted in CAA patients a significant increase of all biomarkers in RBCs and a higher $A\beta_{1\text{-}40}$ and α-synuclein levels in plasma. Moreover, it was found an increased $A\beta_{1\text{-}42}/A\beta_{1\text{-}40}$ ratio in RBCs and decreased ratio in plasma of CAA patients.
Conclusions: In conclusion, our study provides evidence concerning the possible use of blood biomarkers for contributing to CAA diagnosis, although it is essential to confirm this preliminary data in larger studies.

		HC=20	CAA=20	P value
RBC	$A\beta_{1\text{-}42}$	5,84±2,70	29,89±8,41	< **0.0001**
	$A\beta_{1\text{-}40}$	10,92±6,59	39,33±9,72	< **0.0001**
	t-tau	2,71±2,74	10,79±6,07	< **0.0001**
	α-syn	4,54±3,95	14,19±2,80	< **0.0001**
	Ratio $A\beta_{1\text{-}42}/A\beta_{1\text{-}40}$	0,53±0,35	0,85±0,59	**0.0121**
Plasma	$A\beta_{1\text{-}42}$	1,01±0,51	0,76±0,45	0.1124
	$A\beta_{1\text{-}40}$	4,13±1,39	5,93±1,56	**0.0067**
	t-tau	0,06±0,02	0,08±0,04	0.0994
	α-syn	1,26±0,33	1,87±0,65	**0.0295**
	Ratio $A\beta_{1\text{-}42}/A\beta_{1\text{-}40}$	0,37±0,15	0,19±0,05	**0.0011**

Disclosure of interest: No

1355

WHOLE-EXOME SEQUENCING FOR THE IDENTIFICATION OF GENETIC VASCULOPATHIES AMONG A COHORT OF PRIMARY CNS VASCULITIS

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Background and aims: Genetic vasculopathies can mimic systemic vasculitis including predominant CNS involvement. We aim to identify whether there is a significant subgroup of genetic vasculopathy among a group of probable Primary CNS Vasculitis patients, PCNSV (without brain biopsy) using singleton whole-exome sequencing (WES).
Methods: We included patients from the ongoing AIIMS PCNSV registry who satisfy the criteria for probable PCNSV. All patients underwent singleton WES. Virtual diagnostic panels were applied to exome data and ACMG criteria was applied to classify identified variants. Cases were considered solved where pathogenic or likely pathogenic variants consistent with the phenotype were identified, likely solved where suitable VUS were identified and unsolved where no suitable variant were found.
Results: We have recruited 28 probands including 8 trio samples out of planned sample size of 60 probands. All 28 probands underwent singleton WES. After analysis, five patients (18%) were solved or likely solved. Two patients were solved (*NOTCH3, TGFB3*), three patients were likely solved (*NLRP3, KRIT1, XYTL1*), VUS was identified in one patient (*SQSTM1*) and 23 (82%) probands did not show any tiered variants. Results of singleton WES in 32 probands are pending followed by segregation analysis of likely solved and VUS cases.
Conclusions: The diagnostic yield of 18% of genetic vasculopathies in a cohort of probable CNS vasculitis is unique in understanding the phenotype and genotype of PCNSV. Larger studies using multicentre and multinational collaboration are needed the validate the results of this ongoing study.
Funding: AIIMS Intramural Research Grant, India
Disclosure of interest: No

1605

Plasma CGRP levels are not associated with collateral flow and outcome after stroke

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Background and aims: The selection of stroke patients for endovascular treatment currently depends on advanced imaging. A blood-based biomarker for collateral flow might support patient selection in the absence of advanced imaging. Calcitonin gene-related peptide (CGRP) mediates cerebral blood flow autoregulation as a potent vasodilator.
Methods: We determined the kinetics of plasma CGRP levels after stroke and their association with collateral flow, and both imaging and 90-day clinical outcome in 54 randomly selected patients from the ongoing CIRCULAS study. Regional leptomeningeal collaterals, penumbral and infarct core volumes were measured using baseline multimodal CT. Final infarct volumes were manually segmented on follow-up scans. The relation between CGRP levels and imaging and clinical data was explored using univariable regression models.
Results: CGRP levels of stroke patients (age 78 [70-86] years, 37% female, NIHSS score 13 [7-18], time from onset 4.7 [2.5-7.0] hours) upon hospital admission ranged from 33.5 to 1050 pg/ml and followed a normal distribution. CGRP levels did not change from hospital admission to the next morning (admission: 186 [129-239] vs. next morning: 184 [124-307] pg/ml, p=0.44). No associations were found between admission CGRP levels and CTA collateral scores or severity of ischemia on CT perfusion. Admission CGRP levels did neither predict final infarct volume nor clinical outcome at 90 days (all $p>0.05$).
Conclusions: Stroke patients present with largely varying but stable plasma CGRP levels, which are neither associated with collateral flow nor clinical outcome. Future studies might need to utilize hypothesis-free 'omics' approaches to identify biomarkers for collateral flow.
Disclosure of interest: No

1690

Genome-wide association (GWAS) study in cervical artery dissection patients with stroke

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Background and aims: Cervical Arterial Dissection (CeAD), a major cause of stroke in young people, is considered a multifactorial disease associated to environmental factors and genetic susceptibility. Stroke in CeAD is a consequence either of embolism originating from the injured intima or of hemodynamic compromise. The impaired ability to provide adequate cerebral blood flow during ischemia might be associated to genetic factors. We aimed to compare genetic variants in patients with CeAD with stroke versus CeAD patients without stroke, using genome-wide association study (GWAS).
Methods: A prospective registry of Chilean population ⩾ 18 years old with clinical and radiological diagnosis of CeAD was performed. Genome-wide genotyping data was processed in PLINK v.1.9. The threshold for significance after applying Bonferroni correction was set at $P<5x10-8$. The data obtained were visualized using the packages *data.table; fastman; qqman* for Manhattan plots and quantile-quantile plots in R.v.4.2.2.
Results: 93 CeAD patients were registered. Nineteen (20%) patients with CeAD related acute stroke were identified. Both groups had similar characteristics. The GWAS of CeAD patients with stroke compared to those without stroke identified rs12425189 on chromosome 12, located within an intron of the Rabphilin-3A (RPH3A) gene (P=0.006).
Conclusions: These findings suggest that there may be a potential novel regulatory mechanism for RPH3A, a synaptic vesicle protein significantly involved in the pathophysiology of reperfusion injury in animal models, or other genes in the nearby genomic region with potential functional implications in stroke in association with CeAD. More studies in this population are needed.

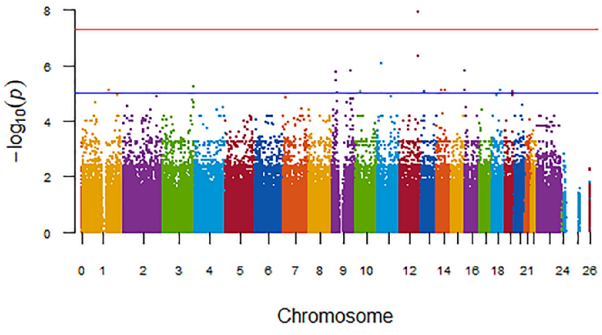

Figure 1. Manhattan Plot.

Disclosure of interest: Yes

1770

DECREASING PLASMA MID-REGIONAL PRO-ADRENOMEDULLIN LEVEL AS A PREDICTOR OF THE FAVORABLE NEUROLOGICAL OUTCOMES IN ACUTE ISCHEMIC STROKE

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Background and aims: Adrenomedullin (ADM) is a neuroprotective peptide secreted as a compensatory response to brain ischemia. Recently, we have reported plasma mid-regional proADM (MR-proADM), a stable peptide fragment of the ADM precursor, as a biomarker of the ischemic penumbra in acute ischemic stroke (AIS). In this study, we investigated the association between decreasing plasma MR-proADM levels and neurological outcomes in AIS.
Methods: Consecutive AIS patients within 4.5 hours of the onset were prospectively enrolled between 2017 and 2019 and were divided into the decrement group and non-decrement group, based on whether the plasma MR-proADM levels decreased from day 1 to 3 or not. The NIH Stroke Scale (NIHSS) scores were compared between the two groups.
Results: Among 86 patients (median age, 76 years; male, 59%), NIHSS scores on day 1 were comparable between the two groups (median [IQR], 6 [3–8] vs. 9 [5–16], P=0.24). However, NIHSS scores at discharge were significantly lower in the decrement group than the counterpart (0 [0–2] vs. 3 [0–7], P=0.001), even after adjusting for age, sex, premorbid modified Rankin Scale, NIHSS on day 1, eGFR, and reperfusion therapy (β= −3.11 [95%CI, −5.96–−0.263], P=0.033). The changes in the levels of MR-proADM from day 1 to 3 were significantly correlated with the changes in the NIHSS scores from day 1 to discharge (r=0.231, P=0.032).
Conclusions: The decrement of plasma MR-proADM levels, indicating the early recovery of the penumbra, could be a potential predictor of favorable outcomes in AIS.
Disclosure of interest: No

1789

GENETIC ETIOLOGY OF CEREBROVASCULAR DISEASE, EXPERIENCE IN A THIRD LEVEL CENTER IN MEXICO

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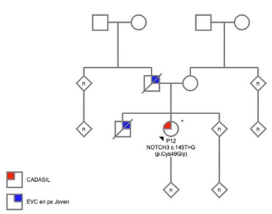
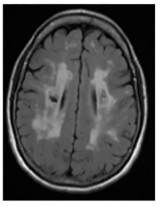
Background and aims: Stroke is one of the most important causes of disability in the world. Environmental risk factors are very well identified. 30% of cases of cerebrovascular disease remain of undetermined origin. In 2022 our neurological centre treated 900 patients of which 20% did not find the cause of the stroke.
Methods: Retrospective, transversal, descriptive study of patients treated at the National Institute of Neurology from January 2021 to December 2022, 30 patients with neurological alterations and MRI imaging patterns suggestive of vascular disease of genetic aetiology were recruited, who had been completely protocolised without evidence of stroke aetiology, the patients were evaluated in the neurogenetics clinic and as part of the diagnostic approach, a study was conducted Invitae Leukoencephalopathy Panel, Test code: 55002.
Results: Of 30 patients analyzed, 11 (36.67%) presented pathogenic genetic variants corresponding to leukodystrophies and 3 (10%) presented genetic variants corresponding to vascular leukopathies: COL4A2 (small vessel disease type 2), NOCHT3 (CADASIL) and TREX1 (retinianine vasculopathy as leukoencephalopathy) that explained their clinical picture. In all cases, phenotype-genotypic correlation was performed, both clinically and by MRI.
Conclusions: The diagnostic approach of stroke patients of uncertain aetiology with complete protocols and suspected genetic aetiology should include new generation molecular studies as an approach, avoid delay in diagnosis, establish timely treatment and provide genetic counselling to the patient and family. It is necessary to design studies that allow us to know the epidemiology and to plan an approach strategy and include these tests in their study protocol.

Case	Molecular diagnosis	Zygocity	Variant Classification	Final Diagnosis
2	NOTCH3 c.145T>G (p.Cys49Gly)	Heterozygous	Pathogenic	CADASIL

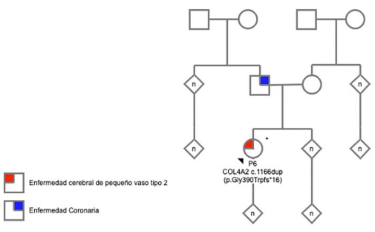


The subject in whom the presence of a variant in the heterozygous state in NOTCH3 has been confirmed is marked with an asterisk. They call the attention of a brother and father deceased due to repeated CVD in a young patient.

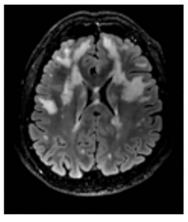


Axial Flair MRI with predominantly periventricular leukoencephalopathy and multiple areas of hemorrhage

Case	Molecular diagnosis	Zygocity	Variant Classification	Final Diagnosis
1	COL4A2 c.1166dup (p.Gly390Trpfs*16)	Heterozygous	Pathogenic	Brain small vessel disease type 2



The subject in whom the presence of the pathogenic variant in COL4A2 has been confirmed is marked with an asterisk. In blue, the patient with a clinical diagnosis of coronary disease, a possible manifestation of the same clinical picture as the index subject, is marked.



MRI FLAIR weighted images of a CADASIL patients showing ischaemic lacunae and frontal and temporal

Disclosure of interest: No

1963

PROTEOMICS-BASED CLASSIFICATION OF TRANSIENT ISCHAEMIC ATTACKS, MIMICS AND HEALTHY CONTROLS USING MACHINE LEARNING

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Background and aims: A transient ischaemic attack (TIA) acts as a warning sign for an ischaemic stroke. Accurately differentiating TIAs from TIA-mimics (e.g., migraines, seizures, etc.) can significantly reduce the risk of stroke. Our pilot study in 2021 (n=18) (Milton, 2021) identified candidate protein biomarkers. We aim to expand on the pilot by using our larger sample set to classify TIAs, TIA mimics and healthy controls (n=65) using plasma proteomics and machine learning models.
Methods: Patients with suspected TIA were enrolled from a COMmunity-Based rapid Assessment TIA clinic (COMBAT) and a hospital-based Rapid Assessment Clinic (TQEH-RAC) in addition to healthy controls. Patients were classified retrospectively as TIA, or TIA-mimic by a neurologist and a GP with Special Interest in Stroke (GP-SIS). Clinical data and blood samples were collected at time of enrolment. The samples underwent proteomic processing using updated DIA-PASEF methodology on a Tims*TOF* Pro Mass Spectrometer. Machine learning models, including a support vector machine classifier and decision trees, are being trained and optimised on the data and validated using cross-validation.
Results: The sample cohort consisted of 65 participants (29 TIAs, 13 TIA-mimics, 23 healthy controls). Proteomic data was processed using DIA-NN and analysed using the MetaboAnalyst platform. A total of 390 proteins were identified.
Conclusions: Previously we identified protein subsets that differed significantly ($p<0.02$) between groups (Milton, 2021). The newly identified proteins and combinations on the full sample set (n=65) are undergoing further refinement using machine learning to develop an optimal multivariate classifier for use in future large-scale studies.
Disclosure of interest: No

2028

APOPTOSIS BIOMARKERS DYNAMICS IN ISCHEMIC STROKE

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Background and aims: This exploratory study aimed to assess the dynamics of blood concentration of apoptosis biomarkers in acute ischemic stroke (AIS) and to search for their potential associations with neurological deficit and lesion volume.
Methods: 62 anterior circulation AIS patients and 40 small vessel disease (SVD) patients with no history of AIS were recruited. Neurological status was assessed using the National Institutes of Health Stroke Scale (NIHSS). Magnetic resonance imaging (MRI) was used to verify the diagnosis. ELISA assay was used to assess pro-apoptotic (p53) and anti-apoptotic (Bcl-2) factors concentrations at baseline and on the 10th day after admission. The Local Ethics Committee approved this study.
Results: In AIS, p53 and Bcl-2 concentrations were higher than in SVD (19.03±13.94 vs. 3.12±3.00 ng/ml, $p<0.05$ at baseline, 15.91±11.76 vs. 3.76±4.00 ng/mL, $p<0.05$ on the 10th day). Baseline p53 concentration was higher in patients with higher NIHSS score (⩾10) than in patients with lower one (3.30±2.08 vs. 19.82±16.90 ng/mL, $p<0.05$). Additionally, baseline p53 concentration was higher in patients with larger (⩾50 mL) DWI lesion at admission (17.97±13.55 vs. 0.38±0.25 ng/mL, $p<0.01$) and on the 10th day (20.65±14.97 vs. 0.50±0.37 ng/mL, $p<0.01$). On the 10th day, Bcl-2 concentration was higher in patients with larger (⩾50 mL) DWI lesion (5.07±5.49 vs. 0.12±0.08 ng/mL, $p<0.01$).
Conclusions: The delayed apoptosis activation in ischemic brain could be associated with stroke severity and lesion volume. Additional studies are needed to improve the understanding of the prognostic value of apoptosis biomarkers in AIS.
Disclosure of interest: No

2445

BRAINCHECK: A RAPID POINT-OF-CARE BLOOD TEST FOR THE MANAGEMENT OF CEREBROVASCULAR DISORDER PATIENTS IN THE AMBULANCES

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Background and aims: ABCDx DUOCheck™ is a rapid test for the concomitant quantitative measurement of NT-proBNP and H-FABP in human blood samples with the ABCDx BRAINCheck™ App software. Individually, NT-proBNP or H-FABP concentrations are not sensitive enough for stroke diagnosis in routine clinical practice. However, their combination has been described as key tool for the triage of LVO patients. This device may help in earlier patient management in ambulances.
Methods: DUOCheck™ is a duplex lateral flow assay method based on a unique combination of monoclonal dye conjugate and solid phase antibodies to identify NT-proBNP and H-FABP. After the addition of 50µL whole blood, intensities of the test lines were quantified at 15 min with BRAINCheck™ smartphone reader. Linearity and low limit of quantification (LLOQ) were assessed using serial dilution of standardized samples and blood patient samples. BRAINCheck™ was compared to classical ELISA assays (MSD).
Results: The dose response fitted a linear regression within the range of 450 to 6500 pg/mL for NT-proBNP and 3 to 120 ng/mL for H-FABP. LLOQ in blood was fixed as 450 pg/mL for NT-proBNP and 3 ng/mL for H-FABP. Strong Spearman correlation was found for H-FABP ($\rho=0.77$, $p<0.001$) and NT-proBNP ($\rho=0.82$, $p<0.001$) when MSD and DUOCheck™ concentrations were compared.
Conclusions: The quantification of both NT-proBNP and H-FABP using the DUOCheck™ and BRAINCheck™ smartphone App may lead to a rapid triage decision of LVO patients, already in ambulances. This may improve patient's management and assist medical doctors to provide earlier the most appropriate treatment to patients.
Disclosure of interest: Yes

CLINICAL PRACTICE, MANAGEMENT AND CARE

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MOLDOVIAN EXPERIENCE ON RES-Q REGISTRY FOR MONITORING THE QUALITY OF STROKE CARE FROM 2017 TO 2022 YEAR

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Background and aims: RES-Q Registry is the first stroke database in Republic of Moldova. The aim is to map key performance indicators for quality of stroke care and to improve stroke management.
Methods: Each center registers all stroke patients hospitalized in march, yearly.
Results: The number of participated centers has increased from 4 in 2017 to 15 in 2022. In six years we have registered 2785 patients. The median age was 68 years, median NIHSS at admittance was 9 points. Our results showed improvement of revascularization procedures: intravenous thrombolysis increased from 1,12% in 2017 to 9,4% in 2022, and mechanical thrombectomy from 0,49% in 2019 to 3,1% in 2022, the door-to-needle time decreased from 85 to 51 minutes and door-to-groin time from 228,5 to 108,5 minutes in the investigated period. Median Modified Rankin Score at discharge did not change significantly and mortality has decreased (from 24,52% in 2017 to 12,4% in 2022). Most of the patients received secondary prevention therapies that were level-1 evidence-based processes of care; antihypertensive agents (93,15%-95,6%), antiplatelets drugs (91,1%-98,89%), anticoagulants for patients with atrial fibrillation (34% in 2018 vs 70,5% in 2022), but cholesterol-lowering medication was prescribed to less than a half of the participants (34,73%-42,3%). Secondary stroke prevention might be improved by increasing the usage of statins.
Conclusions: For a better prognosis of stroke we need to increase the number of stroke units, the educational activities, and to elaborate and implement a national stroke plan.
Disclosure of interest: No

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Investigating Quarterly Stroke Unit Admission Rates from the Irish National Audit of Stroke

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Background and aims: Care within a stroke unit (SU) improves outcomes in stroke patients. Admission rates of stroke patients to an SU is a national key performance indicator collected by INAS. 2020 and 2021 showed a reduction in SU admission rate. We performed an analysis to see if hospital overcrowding is associated with SU admission rate.
Methods: Quarterly data on proportion of stroke patients admitted between Q1 2013 and Q4 2021 were analysed against the Irish Nurses & Midwives Organisation (INMO) data on hospital Trolley Count; the number of patients awaiting admission to a hospital bed. Proportions were compared using Chi Square statistic.
Results: SU admission increased from 65.2% in 2013 to 72.7% in 2018 (Chi Sq 41.5, $p<0.0001$), subsequently reducing to 69.8% in 2021 (Chi Sq 8.83, $p=0.003$). Annual Trolley Count increased from 42954 in 2013 to 90497 in 2019 (111% increase) reducing to 44565 in 2020 and 60546 in 2021. Between 2013 and 2021, SU admission rate was highest in Q2 (69.8%) and Q3 (70.7%) compared with Q1 (67.2%) and Q4 (66.2%). There were significant differences in Q3 and Q4 SU admission rates (Chi Sq 39.4 $p<0.0001$) and Q1 and Q2 (Chi Sq 14.4, $p=0.0001$). Trolley count was highest in Q1 followed by Q4.
Conclusions: SU admission rates are lowest in Q1 and Q4 corresponding with maximum trolley count. The fall in SU admission rate 2020/21 was associated with a drop in trolley count and is more likely due to infection control measures than overcrowding.
Disclosure of interest: No

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Comparison of Complications of Carotid Artery Stenting among Consecutive Patients above and below age 70 at The Ottawa Hospital, a Comprehensive Stroke Centre in Ontario, Canada

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Background and aims: Stroke prevention guidelines recommend carotid endarterectomy (CEA) over carotid artery stenting (CAS) for patients above age 70 with symptomatic extracranial carotid stenosis. We compared complications among patients above and below age 70 undergoing CAS at The Ottawa Hospital in Ontario, Canada.
Methods: We retrospectively identified consecutive patients who underwent CAS from June 2019 to May 2021. We captured baseline characteristics, imaging details, and Vascular Surgery's involvement. We calculated Odds Ratio (OR) using R (version 4.2.2) to compare complications in the first 24 hours post-CAS.
Results: We included 140 patients; 93% were symptomatic and 61% were male. The average age was 70.4 years; 54% were above age 70. Most (73%) patients above age 70 underwent CAS without prior assessment by Vascular Surgery. There were no differences in intraprocedural complications (OR 0.76, 95% CI 0.37-1.54, p=0.45) and post-procedural complications among those above and below age 70. One patient above and one below age 70 experienced perioperative myocardial infarction; none had a stroke or died. We did not assess outcomes at 90 days or beyond, or among patients undergoing CEA.
Conclusions: Although most patients in our study were above age 70, they were not assessed by Vascular Surgery for endarterectomy prior to stenting. Periprocedural and post-procedural complications and serious adverse events within the first 24 hours of CAS were similar between patients above and below age 70.
Disclosure of interest: No

571

Predictors and Outcomes of CTP Utilization in the Drip-and-Ship Model

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Background and aims: Computerized tomography perfusion (CTP) determines thrombectomy eligibility in the late window and after thrombolysis (IV tPA) in the early window. We characterize differences in patients with large vessel occlusion (LVO) who received IV tPA selected to go to CTP vs. angiography.
Methods: 160 patients who received IV tPA and were transferred for the intention of thrombectomy were retrospectively evaluated from January 2020 to June 2022. Baseline characteristics, time efficiencies, and clinical and radiographic outcomes were compared between the groups that transferred to CTP vs. no CTP using two sample t test and Mann Whitney U test.
Results: Comparing the CTP and no CTP groups, door-to-needle time (median in minutes [IQR]: 62 [47] vs. 54.5 [32], p=0.995), mean age (71.52±11.62 vs. 70.13±14.78, p=0.871), location of occlusion (% anterior: 97.7% vs. 82.4%, p=0.127), and time of day (% day time: 79.5% vs. 71.6%, p=0.131) were not statistically significant. However, the CTP group had a lower presenting median NIHSS (8.00 [13] vs. 14.00 [13], p=0.006). Of those receiving thrombectomy, there was no significant difference in median door to groin time between the groups that went directly to angiography vs. CTP (25 [18] vs. 39 [34], p=0.996). Median mRS at 90 days was similar (3 [4] vs. 3 [3], p=0.435).
Conclusions: Presenting NIHSS may predict whether LVO patients who receive thrombolysis get additional imaging upon transfer. Employing CTP in those ultimately receiving thrombectomy does not seem to lead to significant delays in groin puncture times or clinical outcomes in this population.
Disclosure of interest: No

910

Reducing Door to Needle Time through Simulation-Based Education

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Background and aims: Many medical specialty trainees report a lack of confidence in hyperacute stroke management, contributing to inefficient patient care. We identified a lack of knowledge of our pathways, as well as difficulty managing human factors, particularly communication and teamwork. We hypothesised that the implementation of a simulation-based education programme could address these issues and lead to improvements in our door-to-needle (DNT) times.
Methods: We organised a scenario-based simulation education session for our trainees led by a multi-disciplinary faculty. We addressed the management of acute ischaemic stroke, intracerebral haemorrhage, and basilar artery occlusion, as well as thrombolysis complications. Learners were surveyed before and after each session to gauge improvements in knowledge and confidence using a Likert scale. Free text feedback was sought from both learners and faculty to identify areas for improvement. We measured the mean DNT 3 months before and after our session.
Results: We improved both the knowledge and confidence of trainees in managing hyperacute stroke presentations and the human factors involved in a stroke pathway. We received feedback regarding the staffing of our on-call team and improving communication, including the use of lanyard cards and single point of contact devices. We also noted an improvement in our mean DNT amongst trainees who attended our training from 51mins to 34mins. Our simulation programme is expanding locally and regionally to improve training across all healthcare trusts.
Conclusions: Simulation education is beneficial in improving knowledge and confidence in the management of hyperacute stroke and can contribute to reduced DNT.
Disclosure of interest: No

992

TRANSIENT GLOBAL AMNESIA: THE IMPORTANCE OF A MULTIDISCIPLINARY EVALUATION

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Background and aims: Transient global amnesia (TGA) is characterized by the presence of an amnestic period, with a length of no longer then 24h. It can mimic some life-threatening conditions, like a vascular event. The aim of this study is to characterize these patients.
Methods: From January 2004 to December 2022, 76 patients were diagnosed with TGA and were eligible for this study. A comprehensive analysis of the clinical data, including neuropsychological evaluation and follow up period was performed.

Results: 61 patients were women (age ẋ=60±12y). Prevalent vascular risk factors were dyslipidemia and HBP. For most patients, the event lasted less than 8 hours. An apparent emotional trigger was present in 67. At ER admission, more than half presented a systolic >140mmHg. In MRI study hyperintensive signal in hippocampus was observed in 21 patients (either bilateral or unilateral). During follow up period (3 to 6 months), control MRI showed no abnormalities, 4 patients had a vascular event, and in neuropsychological evaluation was observed slow processing speed, impairment in verbal fluency and severe anxiety symptoms.
Conclusions: TGA was prevalence in women, with dyslipidemia and HBP as the most common vascular risk factors, no abnormalities observed on control MRI, slow processing speed, impairment in verbal fluency and anxiety symptomatology were observed on neuropsychological evaluation. Can TGA be a vascular response to stress? Or a neuropsychiatric condition? Nevertheless, it is important to reassure these patients that their prognosis is usually good and reassures clinicians that these patients do not need more extensive testing.
Disclosure of interest: No

1057

Impact of High-intensity Statin on Early Neurologic Deterioration in Patients with Single Small Subcortical Infarction

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Background and aims: Atherosclerosis process is hypothesized as one of the major mechanisms of early neurologic deterioration (END) in single small subcortical infarction (SSSI). However, the association of statin therapy, particularly high-intensity statin therapy, with reduced END incidence remains unclear during the acute phase of SSSI. This study aimed to investigate the influence of high-intensity statin therapy compared to moderate-intensity statin therapy during the acute phase on the incidence of END in SSSI.
Methods: The records of 492 patients with SSSI who received statin therapy within 72 h of symptom onset from a prospective stroke registry were analyzed. The association between END and statin intensity was evaluated using multivariable regression analysis for adjusted odds ratios (aOR).
Results: Of the 492 patients with SSSI (mean age 67.2 years, median NIHSS score on admission 3), END occurred in 102 (20.7%). Older age (aOR, 1.02; 95% Confidence interval [CI], 1.00–1.05; $p = 0.017$) and branch atheromatous lesion (aOR, 3.49; 95% CI 2.16–5.74; $p < 0.001$) were associated with END. Early high-intensity statin therapy was associated with a lower incidence of END than moderate-intensity statin therapy (aOR, 0.44; 95% CI, 0.25–0.77; $p = 0.004$). Patients with END had less favorable outcome at 3 months (aOR, 0.18; 95% CI, 0.09–0.35; $p < 0.001$).
Conclusions: We identified an association between the intensity of early statin therapy and END in patients with SSSI. Early high-intensity statin therapy (⩽72 h) is associated with a reduced incidence of END in patients with SSSI.
Disclosure of interest: No

1297

Changes in Processes of Stroke Care Following the Covid-19 Pandemic from the Irish National Audit of Stroke

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Background and aims: The Covid pandemic resulted in substantial challenges to delivery of care in hospitals. The Irish National Audit of Stroke collects data on patient processes and outcomes from Irish hospitals. We reviewed data from the two years before the pandemic 2018-2019 with the two subsequent years 2020-2021 to look for changes in care.
Methods: Data for four years from January 2018 to December 2021 were analysed. Proportional data related to key performance indices were compared used Chi Square statistics.
Results: Population demographics were unchanged (M:F 57% : 43%. Median Age: M 72 years, F 78 years). Proportion admitted <3hours decreased (50.4% to 47.6%. Chi sq 6.78, p=0.009) but reflected a continuous drop from 61% in 2014/15. Proportions reviewed <10minutes from admission increased (40.1% to 48.9% Chi Sq 107.5 p<0.0001) and imaged <1 hour from admission increased (39.0% to 47.5% Chi Sq 124.1, p=0.0001).
Proportion admitted to stroke unit reduced slightly (72.1% to 70.2%, Chi Sq 7.73 p=0.006) but admission restriction due to infection control increased significantly (3.7% to 10.1%. Chi Sq p<0.0001) and the proportion admitted from nursing homes dropped (3.7% to 3.2%. Chi Sq 4.8 p=0.028).
Thrombolysis rate of ischaemic stroke declined non-significantly (11.2% to 10.3%. p=0.07) but those thrombolysed after arriving <4 hours from onset dropped more profoundly (29.1% to 24.8% p=0.0006). Thrombectomy numbers increased by 31.5% (610-802).
Conclusions: Quality of stroke care has largely been preserved since the pandemic with some small improvements. Delay to presentation with stroke represents a continuing and worsening problem.
Disclosure of interest: No

1312

PATIENT FLOW ANALYSIS WITH FAST TRACK STROKE MRI IN THE EMERGENCY DEPARTMENT

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Background and aims: Early detection of stroke is essential for good treatment outcomes, and the superiority of magnetic resonance imaging (MRI) is already established. Triage by a stroke specialist in the Emergency Department (ED) may also facilitate this process. Reduced length of stay (LOS) in hospital may improve prioritization of resources. However, the effects of these combined measures upon LOS remains to be determined. We aim to evaluate LOS before and after implementation of a front-line stroke specialist with access to fast-track stroke MRI in the ED.
Methods: We used retrospective data of patients admitted to the neurologic ED at Herlev Hospital, extracted from the electronic health records. We calculated the average LOS and the percentage of patients who were discharged within 24 hours, and compared between two time periods, i.e., before and after implementation of front-line stroke neurologists with fast-track stroke MRI. The periods were January 1st to December 31st, 2019, and January 1st to December 31st, 2020, respectively.
Results: 13851 patients (55% women) were admitted to the neurologic ED, 6650 before and 7201 after implementation of frontline stroke specialists and fast-track stroke MRI. Before implementation, the geometric

average LOS was 0,94 days (0,91-0,98 95% CI), which post-implementation was reduced to 0,66 days (0,64-0,68 95% CI). The percentage of patients who were discharged within 24 hours increased from 50,4% to 64,0% ($p < 0,001$), after implementation.
Conclusions: Front-line stroke specialists with access to fast-track stroke MRI in ED was associated with reduced average LOS in hospital.
Disclosure of interest: No

1596

Patient-centered priorities associated with ischemic stroke and cancer

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Background and aims: Comorbid cancer and stroke creates a complex situation with multiple factors affecting quality of life (QoL). No specific questionnaire exists to measure patient-centered preferences and outcomes in patients with cancer-related stroke.
Methods: After developing a structured survey instrument, we interviewed patients with recent ischemic stroke and active cancer to assess their views about their condition, factors currently impacting QoL, concerns for the future, and their preference regarding antithrombotic treatment.
Results: At two quaternary-care stroke and cancer centers, we surveyed 50 patients with cancer-related stroke (mean age 70 years, 42% women). Most patients (87%) had solid cancers, while 13% had hematologic cancers. The most frequent adverse feelings were sadness and anxiety about another stroke. Disability/dependency from stroke and pain from cancer were the items rated to have the highest current effect on patients' QoL; bleeding was the lowest (Figure a). Cognitive/memory impairment, dependency on others, and speech disturbance were the highest ranked future concerns; bleeding and pain were the lowest (Figure b). When questioned about antithrombotic preferences to prevent further stroke, 50% favored a more aggressive approach with anticoagulant therapy, 16% favored a less aggressive approach with antiplatelet therapy, and 34% were neutral/unsure.
Conclusions: Patients with cancer-related stroke reported that stroke disability and cancer pain were their most concerning current issues, while long-term cognitive impairment, functional dependence, and speech disturbance were their most
Disclosure of interest: No

1705

Dilational vs. Surgical Tracheostomy in Patients with Severe Stroke - a SETPOINT2 post hoc-Analysis

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Background and aims: The SETPOINT2 randomized trial assigned 382 mechanically ventilated patients with severe stroke to early tracheostomy or standard procedure including tracheostomy. Six months after stroke onset no significant difference of functional outcome was observed between both treatment groups. Dilational tracheostomy (DTT) was the preferred method, however, surgical tracheostomy (STT) was performed in 41 of 307 tracheotomized patients. We aim to compare 41 patients treated with surgical tracheostomy and patients treated with dilational tracheostomy.
Methods: We will describe and compare DTT and STT groups of the SETPOINT2 trial. Frequency of decannulation at 6 months after stroke onset was chosen as primary endpoint, as unaided breathing and vocalization are important goals of rehabilitation after severe stroke. Secondary outcomes include duration of mechanical ventilation, complications, and functional outcome at 6 months.
Results: Tracheostomy was performed 7 (+/-4.5) days after intubation. A first analysis of the frequency of decanulation at 6 months revealed no significant difference in surviving DTT patients (158/264; 59.9%) and in STT patients (24/41; 58.5%). In a second step, we are currently performing competing risk analyses to assess the role of death and missing data on the primary outcome. Further results will be provided with the final presentation.
Conclusions: The preliminary results of this our analyses of SETPOINT2 data suggest that frequency of decannulation in both groups may not differ. Our analysis is based on one of the largest, prospectively collected datasets of tracheotomized patients with severe stroke and will further inform on subgroups with dilational and surgical tracheostomy.
Disclosure of interest: No

1836

Occupational therapy practice in assessing and treating people with stroke who wish to return to work

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Background and aims: Approximately 100,000 people in the UK experience a stroke each year, one in four being of working age. One third of these do not return to work due to the effects of stroke. Occupational therapists frequently provide return to work services. This study aimed to describe current occupational therapy practice in the UK when working with people with stroke who wish to return to work, and the experience of occupational therapists providing these services.
Methods: A mixed methods study was completed. A survey explored current practice patterns and a focus group explored the experience of occupational therapists. Participants were occupational therapists in the UK who have worked with individuals with stroke for a minimum of six months.
Results: Sixty-eight occupational therapists completed the survey (51% outpatient/community and 49% inpatient). Four people took part in the focus group. Traditional stroke rehabilitation interventions were reported more frequently than practices which specifically address work. Overall, participants felt confident working with this population, but less confident liaising with employers. Lack of resources (wait lists) and flexibility in stroke rehabilitation services were challenging, as was lack of specialist training in vocational rehabilitation.
Conclusions: Occupational therapists can focus on completing more work specific practices when working with this population. More training, specialist occupational therapy roles and flexibility in return to work stroke rehabilitation services are recommended.
Disclosure of interest: No

1847

Comparison of pharmacological induced hypertension and anticoagulation for rescue therapy of early neurologicaldeterioration in lacunar stroke

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Background and aims: Although pharmacologically induced hypertension (PIH) and the anticoagulant, argatroban, have been studied in several clinical trials for the treatment of the early neurological deterioration (END), the efficacy and safety of these treatments remained still unclear. Here, we investigated which would be better as a rescue therapy for the lacunar stroke patients with END.

Methods: Among the prospective stroke registry of Inha University hospital between April 2014 and August 2021, we reviewed the subjects with lacunar stroke who received the PIH or intravenous infusion of argatroban for rescue therapy of END within 3 days of symptom onset. We compared the END recovery defined as the improvement of NIHSS down to the ones on admission, the excellent outcomes (0 or 1 on mRS at 3 months).

Results: Among the 4818 patients with the lacunar stroke, END occurred in the 147 patients. Seventy-nine of END patients received the PIH and 68 patients took the anticoagulation therapy, respectively. Two groups had no difference in age and gender. Compared to the anticoagulation group, PIH group had the higher incidence of the END recovery (77.2% vs. 51.5%, $P < 0.01$) and excellent stroke outcome (34.2% vs.16.2%, $P = 0.04$). Safety outcomes, like hemorrhagic conversion and mortality, did not significantly differed between the two groups.

Conclusions: As rescue therapy for the stroke progression-related END in the lacunar stroke patients,

PIH was more effective with similar safety, compared to the anticoagulation therapy using argatroban.

Disclosure of interest: No

1986

DOES MY DIZZY PATIENT HAVE A STROKE? EVALUATING THE ACCURACY OF REFERRING CLINICIANS TO NEURO-OTOLOGY SPECIALIST SERVICE

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Background and aims: Acute vertigo is a common presenting complaint with a broad differential, including stroke.[1] Here, we analyse and compare the assessment and diagnosis of referring clinicians (emergency care, GP and specialist clinics) with neuro-otology physicians, with a focus on central causes of vertigo.

Methods: Single-centre, retrospective casenote analysis of patients referred to acute neuro-otology clinic over 12 months at the National Hospital for Neurology and Neurosurgery

Results: A total of 112 patients were referred to the neuro-otology specialist clinic from the emergency department (54%), GP (8%) and specialist neurology clinics (38%) with acute vertigo. Referring clinicians assessed for nystagmus in 66% of patients, vestibulo-ocular reflex (VOR) in 27% and performed a dix hall pike test in 15%. In the neuro-otology clinic these examinations were performed in 95%, 81% and 73% of patients, respectively.

There were clinical features of central vertigo in 46% of patients in neuro-otology clinic and of these, 58% were mischaracterised by referring clinicians. The eventual diagnoses were migraine (8%), vestibular migraine (61%), stroke (13%) and other, non-stroke cerebellar syndromes (18%). Only 43% of referring clinicians correctly identified a stroke prior to neuro-otology review.

Conclusions: Our findings highlight the need for better diagnostic tools for acute vertigo aimed at the non-specialist.

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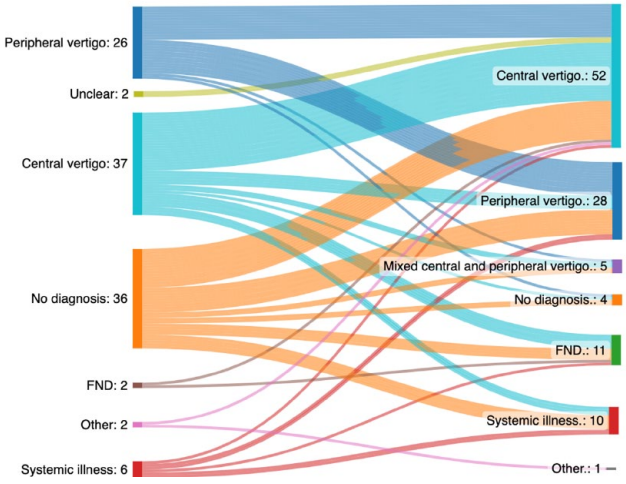

Figure 1. Sankey diagram showing how the diagnosis of referring clinicians (left) compare to neuro-otology specialists (right).

Disclosure of interest: No

2141

EFFICACY OF CEREBROLYSIN ON FUNCTIONAL RECOVERY AFTER MILD AND MODERATE ACUTE ISCHEMIC STROKE IN VIETNAMESE PATIENT

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Background and aims: Cerebrolysin, a brain-derived neuropeptide, has been shown to improve long-term neurological outcomes in patients with acute ischemic stroke (AIS) in previous studies. We investigated cerebrolysin effects on functional outcome after mild and moderate AIS in Vietnamese patients.

Methods: We performed a single-center retrospective analysis of a prospectively collected database from June 2022 to November 2022. AIS patients who presented within 72 hours of onset, NIHSS scale range from 4 to 20 were included. Patients were divided into two groups according to whether they received intravenous Cerebrolysin (20 ml daily for at least 3 days) plus standard therapy or standard therapy alone. The primary outcome was 90-day functional independence (modified Rankin

Scale 0 – 2). Secondary outcomes included early neurological improvement (7-day NIHSS change) and 90-day mortality.
Results: Of the 103 patients included, 51 (49.5%) patients were in Cerebrolysin group and 52 (50.5%) patients were in controlled group. There were no significant differences between two group in baseline NIHSS (median 7 in both groups, p = 0.864), proportion of receiving recanalize therapy (17.2% vs 27.4%, p = 0.217). Compared to standard therapy group, patients in Cerebrolysin group were more likely to achieve functional independence (72.5% vs 51.9%, p = 0.03). No significant differences were observed between two group in early NIHSS change (p = 0.452) and mortality rate (3.9% vs 9.6%, p = 0.437).
Conclusions: In our study, Cerebrolysin shown beneficial impact in functional recovery after mild and moderate AIS in Vietnamese patients.
Disclosure of interest: No

2161

PREDICTION OF PROGNOSIS IN PATIENTS WITH ISCHEMIC STROKE BY PLATELET FUNCTION DETERMINED BY PLATELET FUNCTION ANALYZER (PFA)-100

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Background and aims: The relative risk reduction of prevention of recurrent ischemic stroke by antiplatelet agents is 20-30%. Clinically, it's difficult to identify non-responders until the next vascular events. This study is aimed to test whether the point-of-care measurement of platelet function would be associated with clinical outcome in the acute stage of ischemic stroke.
Methods: We prospectively recruited the participants with acute ischemic from June 2009 to November 2010. The platelet function tests of each patient were scheduled at arrival, within 2 weeks and one month after admission, determined by the closure time of epinephrine (CEPI) cartridges of Platelet Function Analyzer (PFA)-100®. The primary outcome was the modified Rankin Scale (mRS) scores at one month, three months and one year. Univariate analysis and repeated measures of analysis of variance will be used to evaluate the changes in outcome measures.
Results: Totally 212 eligible participants were enrolled, with 135 males (63.7%), mean age 65.1±14.2, median National Institutes of Health Stroke Scale (NIHSS) 3 (interquartile range 1–7), 1st measurement by CEPI cartridges were not associated with independent mRS state (P=0.67). The middle-aged participants and NIHSS less than 16 and difference between 1st and 2nd CEPI cartridges was found a significant association with mRS at three assessment, both in univariate and repeated measures analyses (P < 0.05).
Conclusions: The results supported the difference of sequential PFA-100 measurements in antiplatelet naive participants with ischemic stroke could be served as an indicator for the favorable outcome in acute stage.
Disclosure of interest: No

2188

Attitude towards COVID-19 vaccination in stroke patients

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Background and aims: COVID-19 pandemic has impacted our lives for the last 3 years. Stroke patients were among the most affected category of patients because of the limited access in outpatient clinic, rehabilitation facilities and general stroke care during pandemic. Aim of the study: to assess the knowledge, attitude and factors that influence their decision regarding vaccination in stroke patients.
Methods: Prospective study on 91 patients (53.84% males), with a mean age of 64.45 ± 13.34 years with stroke and 91 sex and age-matched controls. We used a standardized anonymous questionnaire applied to evaluate the attitude of stroke patients regarding COVID-19 vaccination in the period 01.01.2022 – 30.06.2022.
Results: A total of 21 (23.07%) stroke patients were vaccinated against COVID-19 in comparison with 46 (50.55%) in the control group. Regarding the intention to vaccinate in the future: 17.58% of the patients with stroke in comparison with 37.36% in the control group. Factors that influence their hesitation, 31.66% in stroke group and 15.38% in the control group ($p<0.05$) consider that they are worried about the possible adverse events. Vaccine insufficient tested was reported as concern in 37.36% vs 15.38% ($p<0.05$). In both groups (62.64% vs. 56.04) the main source of information was mass-media followed by social-media. Persons with lower education were more reluctant towards vaccination in comparison with persons with higher education.
Conclusions: Patients with stroke are more hesitant regarding the decision of vaccination. Lower education and source of information have a high impact on the decision.
Disclosure of interest: No

2387

RISK FACTORS OF CEREBRAL HYPERPERFUSION SYNDROME AFTER CAROTID ARTERY REVASCULARIZATION IN A PROSPECTIVE COHORT OF PATIENTS

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Background and aims: Cerebral hyperperfusion syndrome (CHS) is a rare but potentially severe complication of carotid artery revascularization. The underlying mechanism is still not fully understood, although impaired cerebrovascular autoregulation plays a major role in its pathophysiology. Our aim was to determine which risk factors affect the development of CHS after carotid revascularization
Methods: This prospective observational study enrolled 371 consecutive patients admitted to the stroke unit of our center with carotid stenosis who were treated either with carotid artery stenting (CAS) or endarterectomy (CEA). Differences on clinical, radiological and peri-procedural data between patients who developed CHS and those who did not were assessed. Risk factors for CHS were analysed by multivariate binary logistic regression.
Results: 297 (80%) patients were treated with CEA and 74 (19,9%) were treated with CAS. 5 (1,3%) patients, all of whom were treated with CEA, developed CHS. Sustained postoperative hypertension requiring intravenous treatment (p: 0,00), and the combination of watershed acute infarcts in the neuroimaging performed at admission together with a blunted or dampened blood flow in the middle cerebral artery on transcranial doppler (p: 0,01) were independently associated with the development of CHS.
Conclusions: The presence of both watershed acute infarcts and a blunted or dampened blood flow in the middle cerebral artery on transcranial Doppler, could serve as a simple tool to identify patients at risk of developing CHS, who would benefit from an intensive blood pressure management in the stroke unit after carotid revascularization.
Disclosure of interest: No

2402

TIA's DIAGNOSTIC SPECTRUM: MOST FREQUENT MIMICS IN THE EMERGENCY DEPARTMENT

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Background and aims: There is a wide range of pathologies that mimic a transient ischemic attack (TIA) in an Emergency Department. Accurate diagnosis is often quite difficult. We hereby present the commonest mimics found after the implementation of a fast-acting protocol (RUN-TIA).
Methods: We included the patients who visited the Emergency Department throughout 2021 with the initial suspicion of TIA. They were assessed by a Neurologist and a MRI was done within the first 24 hours. Hence, we expose the final percentage with real diagnosis of TIA and describe alternative pathologies.
Results: We included 136 patients (mean age: 75 years old, 74 men (54.41%), ABCD2 median: 4), of whom 125 attended the third-month clinical review follow-up.
Diagnosis was finally established by a vascular neurologist: 91/125 (72.8%) presented a real TIA. 34 of them (37.36%) had a positive-DWI lesion in MRI, so they were coded as minor strokes. The remaining patients (34/125: 27.2%) were mimics.
By frequency, seizure was the commonest alternative diagnosis (12 patients: 17.64%), closely followed by neurofunctional diseases (7: 8.82%) and migraine with aura (2: 2.94%).
Anecdotical alternative diagnoses would be: 1 amyloid spell, 1 myasthenia gravis, 1 hypoglycemia, 1 IV cranial-nerve mononeuritis, 1 peripheral-facial palsy, 1 radiculopathy or 1 medication poisoning, each representing 1.47% of the cohort.
Conclusions: In an Emergency Department, almost one third of the episodes identified initially as TIAs are finally other pathologies. Among those, seizures represent the most frequent diagnosis. Therefore, knowing the alternative pathologies is paramount to provide the correct treatment.
Disclosure of interest: No

2457

QUALITY OF TREATMENT FOR STROKE PATIENTS DURING WORKDAYS AND WEEKENDS - CLINICAL EXPERIENCE FROM BULGARIA

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Background and aims: Treatment of acute ischemic stroke means immediate administration of intravenous thrombolysis /IVT/ and subsequent endovascular treatment. This requires rapid assessment and effective team organization 24/7 in every stroke center. Different challenges arise before the medical personnel during and after regular working hours.
Methods: Our team performed a retrospective analysis of some essential indicators of the quality of treatment in stroke patients. Parameters such as door-to-needle time, mRS at hospitalization and discharge, and stroke severity (assessed with NIHSS at admission and discharge) were compared between patients admitted during regular working hours and after them. Data was collected and analyzed for a total of 83 cases treated with IVT for the period from July to September 2022. Only 20 patients arrived during working hours and 63 patients-after.
Results: Results showed a mean door-to-needle time 34 minutes for regular working hours and 32 minutes for cases after working hours. The rest of the indicators, such as stroke severity at admission and discharge, as well as mRS, were similar (Table 1).
Conclusions: The presented results show that effective and quality treatment of patients with acute ischemic stroke can be provided 24/7, but it is necessary to adapt the organization and deal with the specific work difficulties.

Table 1.

	mRS admission	mRS discharge	NIHSS admission	NIHSS discharge
Regular working hours	4.10	2.87	11.78	4.45
On-call times	4.30	3.01	13.06	4.60

Disclosure of interest: No

2491

ISCHEMIC STROKE DESPITE ANTICOAGULATION IN PATIENTS WITH ATRIAL FIBRILATION. A DESCRIPTIVE STUDY IN A TERTIARY CENTRE

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Background and aims: Oral anticoagulants reduce the risk of ischemic stroke in pacients with atrial fibrilation (AF). There is a proportion of patients that suffer a stroke while taking them. Therapeutic decision afterwards may be controversial due to lack of clinical guidelines.
Methods: Study of 112 patients treated in our hospital between 04/2018-10/2021 with acute ischemic stroke while being anticoagulated for AF. We analysed the etiology of stroke using TOAST clasiffication by dividing it into competitive mechanism (lacunar, atherosclerosis. . .) vs cardioembolic. We clasified patients into those who were treated with AVK, in whom we considered infratherapeutic dosage an INR below 2, and those who were on DOAC we considered infratherapeutic treatment patients with low adherence or incorrect dosage. Patients were classified into change of drug, increase dosage, addition of antiplatelet, and atrial appendage closure (AAC) based on posterior decision.
Results: Median age was 77,9 (11). In 26,8% we identified a competitive mechanism, in wich the most common action was to continue treatment (44%). Those with cardioembolic origin (73'2%) who were treated with AVK (60%) there were 63'3% with infratherapeutic dose; therapeutic decision was to continue with AVK in 22'5% and in 42% switching to DOAC. Patients with DOAC were 35,3%, 36'2% were incorrectly anticoagulated and all continued the same treatment. Only 1 patient underwent AAC in addition to DOAC.

Conclusions: Cardioembolic stroke remains the main etiology in patients despite oral anticoagulats. AVK anticoagulated patients are more prone to be undertreated while more than half on DOACs referred correct adherence.
Disclosure of interest: No

2598

Timing of Oral Anticoagulation for Atrial Fibrillation After Acute Ischaemic Stroke: A Survey of Irish Practice

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Background and aims: Equipoise exists regarding the optimal time to commence oral anticoagulation (OAC) for atrial fibrillation (AF) after acute ischaemic stroke (AIS), and the duration of AF requiring anticoagulation. The "1-3-6-12-day rule" or more recently published "1-2-3-4-day rule" have provided useful guidance while we await the publication of randomized trials such as OPTIMAS, ELAN and START. We aimed to describe the opinions and usual practice of Irish stroke clinicians via a survey.
Methods: An online survey was distributed to stroke physicians in Ireland. We asked respondents about their preference of anticoagulants, and to outline their decision-making process for commencing OAC after stroke using 4 standardized clinical vignettes.
Results: Thirty-six Irish physicians replied – 72% were geriatricians and 25% were neurologists. The majority (66%) indicated a preference for DOAC over warfarin. Of the DOACs, apixaban was the most frequently prescribed (69% first-preference). Size of infarct was the most-commonly mentioned factor influencing decision to start OAC. 75% of respondents would commence OAC on day 0 for TIA, but most waited at least a week for a more disabling stroke (NIHSS>9), consistent with European guidelines. Respondents employed various methods to screen for AF after stroke.
Conclusions: Prescribing practices of OAC for AF after AIS in Ireland vary among clinicians. Results of randomized trials will help provide clarity. In the meantime, we should refer to European guidance to direct practice.
Disclosure of interest: No

SERVICE ORGANISATION/QUALITY IMPROVEMENT AND PATIENT CENTERED OUTCOMES

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UNMET NEEDS IN STROKE AFTERCARE – A SURVEY OF STROKE SURVIVORS IN GERMANY

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Background and aims: Stroke is a severe illness with different long-term impairments. Little information is available regarding the unmet needs of stroke survivors in Germany years after their stroke. This survey tried to close some information gaps.
Methods: The German Stroke Foundation developed an unmet needs questionnaire in German based on three different stroke assessment tools and covering different domains of life after stroke. The questionnaire was tested and finalized including stroke survivors' expertise (focus groups). It was sent out in May 2021 to 3,375 stroke survivors included into the database of the German Stroke Foundation.
Results: 979 completed responses could be included in the evaluation (response rate 29%). The majority was male (56%) and on average 56 years old at the time of their stroke. 73% of the respondents had one and 27% more than one previous stroke. The respondents were differentiated according to the time of their previous stroke. 443 respondents had their stroke during the last four years, 450 five or more years ago. Approximately 70% of the respondents in those two groups had at least one unmet need. Unmet needs were primary found in the following topics: further rehabilitation measures, remembering and concentrating, further therapeutic measures, and stiffness in arms, hands and/or legs.
Conclusions: The survey offers an overview of needs of stroke survivors in Germany. Via focusing on the stroke survivor´s perspective, the German Stroke Foundation tries to shed light on unmet needs and to improve stroke aftercare in these areas.
Disclosure of interest: No

303

How good are we at assessing and treating fracture risk in patients after stroke?

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Background and aims: In patient with hemiplegia after stroke the bone mass reduces in the affected side and risk of fractures increases. The aim of this audit was to review if a bone health assessment was completed, and bone protection prescribed in stroke patients deemed at high risk of a fragility fracture.
Methods: Data was collected retrospectively for stroke patients admitted in Royal Cornwall Hospital from July 2022 to August 2022. The stroke admission proforma containing a fracture risk assessment using the Frax (UK) score was reviewed.
Results: From 159 patients admitted only 124 were included in the audit. The mean age was 75.6 years (SD 13.3) and 90 patients were male (56.6%). 124 patients had an ischemic stroke (78%) and 35 patients had a hemorrhagic stroke (22%). 22 patients died (13.8%) and 13 were palliated during admission (8.2%) and were excluded. The mean NIHSS score was 6.5 (SD 6.7) indicating moderate stroke. Notable risk factors were: 24 patients were smokers (42.1%), 20 had recurrent falls (35.1%), 14 had high alcohol intake (24.6%) and 12 patients had a previous fracture (21%). Only 5 patients had the FRAX completed (4%) and 14 patients had bone protection prescribed (11.3%).
Conclusions: The results show that bone health assessment and prescription of bone protection requires significant improvement. We plan to develop an educational intervention for the admitting medical team to improve adherence to clinical guidelines and improved bone health and reduce fracture risk in patients after stroke and reaudit to show its effectiveness.
Disclosure of interest: No

348

PAOLI (People with Aphasia and Other Layperson Involvement) reporting checklist: a guidance for reporting on Patient and Public Involvement in Stroke and Aphasia Research

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Background and aims: Good design of aphasia research protocols requires researchers to include people with aphasia (PWA) as research partners from the onset. Yet the quality of reporting on the level and type of involvement of PWA in the process is poorly documented in the absence of a guideline to measure contribution. This study aims to develop the People with Aphasia and Other Layperson Involvement (PAOLI) reporting guideline based by involving aphasia research experts and PWA after stroke using a co-design approach.
Methods: The EQUATOR toolkit for developing a reporting guideline was followed. The PAOLI guideline was built from: (1) evidence obtained from a scoping review; (2) statements identified from a thematic analysis of in-depth interviews from PWA and stroke survivors without aphasia; (3) the results of a Delphi survey; and (4) the report from the expert consensus meeting.
Results: In total, 66 statements reached consensus following two rounds of the Delphi survey (i.e., with an agreement rate ⩾80%). Consensus levels were the highest in relation to the need to document several aspects on involving PWA in the research team. This included establishing collaborations with aphasia organizations, preparing aphasia-friendly research materials, providing training sessions on research design and processes, and identifying topics most important to PWA.
Conclusions: The PAOLI guideline is the first international consensus guideline for reporting PPI in stroke and aphasia research. Researchers are encouraged to adopt the guideline to improve the quality of their research by documenting the active involvement of PWA within the research team.
Disclosure of interest: No

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How can the UK's National Stroke Audit drive quality improvement in post-hospital care?

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Background and aims: National registries or audit programmes are recognised methods of assessing quality of healthcare delivery. The Sentinel Stroke National Audit Programme (SSNAP) in England has historically focused on acute and hospital-based care. Whilst evidence suggests SSNAP has been successful driving improvements in hospital-based care, this has yet to be established in the community setting. This study explores how SSNAP is perceived by community stakeholders and what factors determine whether it leads to quality improvement.
Methods: An online survey was used to inform in-depth interviews. Participants included individuals working in, commissioning or managing community stroke rehabilitation.
Results: The survey achieved a national sample from a broad group of stakeholders(n=206). Participants described using SSNAP to support diverse improvement activities, including funding for additional staff, resources and service reorganisation. However, several limitations were highlighted and subsequently explored using in-depth interviews (n=20).
Factors enabling SSNAP to be used for quality improvement in community services are underpinned by organisational culture. These include a data-orientated stroke Team Lead, an audit-champion to facilitate team participation and dedicated administrative support. Barriers included lengthy feedback reports without clear "headlines" and doubts regarding accuracy of inputted data such as variations in reporting practice.
Conclusions: Stakeholders are engaged with the post-acute audit and report using data to support a variety of service improvements. Further investigation of the barriers identified are required in order to realise the potential of national clinical audit as a tool for quality improvement in the post-acute stroke setting.
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Disclosure of interest: No

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Improving oral hygiene through using suction toothbrushes leads to reduced incidence of oral thrush and pneumonia in acute stroke

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Background and aims: Substantial evidence links poor oral hygiene to pneumonia. Studies revealed nursing barriers to completing mouthcare including lack of knowledge, equipment and time. Through addressing these barriers, this project aims to improve staff knowledge/confidence and protocol compliance to improve the quality of mouthcare and reduce the incidence of associated infections.
Methods: Multi-Disciplinary-Team training was delivered alongside a trial of suction toothbrushes. The quality of mouthcare was audited using local tools. Anonymous survey was used to measure staff knowledge/confidence. Local protocol and Electronic Patient Records (EPR) system were updated; EPR was audited to assess compliance. Prescription of Nystatin and antibiotics to treat Hospital Acquired Pneumonia/aspiration pneumonia were reviewed to compare the six-month trial period with the previous year.
Results: Of the survey of 5-10 staff members, 100% demonstrated adequate knowledge and average self-rated confidence levels were 4.4/5 after training. Compliance with assessments doubled from 39% to 81% and care plans increased from 52% to 72%. Improved quality of oral health ("Good" increased by 14%) and reduced level of risk ("High risk" decreased by 21%). 25% decrease in prescriptions to treat pneumonia and 65% reduction in Nystatin prescriptions. Overall predicted potential return on investment of £97,200.
Conclusions: Using suction toothbrushes alongside targeted training is both clinically and cost-effective: led to improved quality of mouthcare and reduced incidence of pneumonia and oral thrush. Training effectively improved staff knowledge/confidence.
Disclosure of interest: No

687

Stroke Group Network in the UK

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Background and aims: Stroke Association's vision is to create a vibrant and sustainable network of stroke support groups across the UK. Groups offer support to stroke survivors, carers, family and friends. They are a safe and supportive space to try things again, learn more about stroke and self-care and build confidence. The network supports hundreds of volunteer group leaders, from structured sessions to informal café meet ups, to share experiences, learning and ideas, and get help with practical resources and information.

Methods: A central Group Networks Team ensures systems and processes are in place, develops resources and shares information to help volunteers run groups.
Engagement Officers share local opportunities and bring together groups to learn from and help each other.
Local and national partnerships to create opportunities for people affected by stroke to gain new experiences and reengage in community life.
Results: Stroke Association's Stroke Group Network consists of 379 stroke support groups run by over 1,000 volunteers. This includes 146 Stroke Association support groups, with a membership of over 3,000. Through the network, we also work with 233 independently run stroke support groups, providing them with a benefits package.
Conclusions: Our central team ensures the organisation is consistent, efficient and effective in our work with groups at scale, while supporting staff and groups to be agile and able to respond to opportunities in their communities. Through our programme of engagement events at local and national level, we are building a stronger and more self-sustaining stroke support group community.
Disclosure of interest: No

703

IMMEDIATE IMPACTE OF NURSING PARTICIPATION IN CLINICAL STROKE AUDIT IN CATALONIA

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Background and aims: In 2007 the Catalan Stroke Programme (PDMVC) started Stroke Audit as a tool to assess the quality of acute stroke care. Since 2010 nurses were involved in Stroke Audit data collection. In the 5th edition (ACI5, 2019) and for the first-time, nurse impact and experience were evaluated. Aims: to analyse and describe the nursing experience and to identify elements to improve future stroke audits.
Methods: The quantitative perspective based on the survey's research strategy was selected. An exploratory questionnaire was designed, identifying 5 topics, generating a total of 32 closed and opened questions.
Results: An online questionnaire was sent to 118 health professionals participating in ACI5, obtaining a 33% response rate. The 56% interviewed nurses carry out their professional activity in Neurology and Stroke Units; 30% with an average of 11 years in stroke care and 79% with specific training in stroke care. Almost all the nurses (97%) improved patient care and protocols skills and 82% improved their level of stroke knowledge. Nurses declared (68%) that participating in ACI5 have contributed on the improvement of team communication, professional involvement, workforce development and stablishing new professional networks.
Conclusions: The Stroke Audit is considered as an assessment tool with an immediate positive impact. Nurses perceived as positive the experience and the support received by the coordination team. The participation of nurses in ACI5 improved the knowledge, the team relationship and new professional networks has been created. All these factors contribute to improve the stroke patient care quality.
Disclosure of interest: No

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Indirect impact of COVID-19 on incidence, work-up, readmission and mortality of ischemic and hemorrhagic stroke: a region-wide time trend analysis

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Background and aims: The indirect impact of the COVID-19 pandemic on stroke care is still elusive, particularly regarding in-hospital work-up and mortality. Here we report region-wide data on variations in epidemiology and care of transient ischemic attack (TIA), ischemic and hemorrhagic stroke (IS, HS).
Methods: This population-based interrupted time series study was based on Emilia-Romagna Administrative Healthcare Database. A negative binomial modelling approach to estimate expected values in 2020 based on 2015-2019 data observed was used. Expected 2020 values were compared to observed ones for: number of hospital admissions, type/rate of diagnostic in-hospital work-up (computerized-tomography-angiography, CTA; cardiac-ultrasound, CUS; ECG-monitoring; carotid ultrasound/TCCD), rate of IS reperfusion treatments, re-admissions and 30-day mortality rates.
Results: TIA decreased by up to 46% in the first pandemic wave (95%CI=-51 to -40%), while HS admissions were stable. IS had a relative 28% reduction in the first pandemic wave, with contraction in thrombolysis (-22%,95%CI=-0.36 to -0.18, November 2020) and thrombectomy (-33%, 95%CI=-65 to -25) peaking in the second pandemic wave. CTA use increased during pandemic waves (57%, 95%CI=57-175 in April), as well as CUS (32%, 95%CI=18-36 in April). No significant changes in rates of readmission after IS and HS emerged, while 30d-mortality rates significantly increased (21%, 95%CI=10-58% in November for IS; 7%, 95%CI=1-29% for HS).
Conclusions: COVID associated with indirect 30-day excess mortality, despite standards of care and diagnostic work-up were maintained for patients with cerebrovascular events in the Emilia-Romagna region.
Disclosure of interest: No

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EDUCATING ELDERLY RESIDENTS IN A NURSERY HOME ABOUT STROKE USING FAST HEROES

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Background and aims: FAST Heroes is a health education program that teaches children and their extended family (i.e parents/guardians, grandparents) about stroke symptomatology and the appropriate response to stroke. Previous literature suggests that grandparents can be successfully educated by their grandchildren (Proios et al., 2022). This study examines the possibility to educate elderly people in a nursery home who do not have often contact with their grandchildren using FAST Heroes.
Methods: Fifteen elderly residents (11 women, 4 men; ages 78-92, mean age: 86.67±4.40) took part in this study. With regards to residents'

neurological condition, six of them have dementia, one has mild cognitive impairment, one has suffered a stroke in the past, and one has blood pressure. The residents participated in the program through a specifically designed training plan by a health-care professional using stroke-related material (e.g. PowerPoint presentation, animated videos, story book, semi-structured discussion). The residents completed the Stroke Preparedness Questionnaire (SPQ) (Tsakpounidou et al., 2022) before and after their participation in the program.

Results: Data is being collected at the moment and will be presented. Results will confirm the possibility of educating grandparents who do not have often or close contact with their grandchildren about stroke.

Conclusions: Since older people are prone to suffering a stroke (Gorelick, 2019) we aimed to establish a pathway in order to educate residents in a nursery home who do not have external sources of information about stroke. Visual-audio aids were used in order to foster elderly people's cognitive and perception abilities.

Disclosure of interest: No

949

EDUCATION INTERVENTION TO REDUCE CAREGIVER BURDEN IN NEUROLOGY-INTENSIVE CARE SURVIVORS (ENABLE)

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Background and aims: Patients with neurological diseases like stroke are associated with increased disability requiring prolonged recovery times. This translates to high caregiver burden, which remains largely unmet especially in LMICs. Mobile application (mApp) is a cost-effective tool to empower caregivers with knowledge regarding management of simple medical complications thereby improving care and reducing stress. This study aims to assess the effect of mApp mediated training to caregivers of neurological disease survivors in improving quality of care as well as reducing caregiver burden.

Methods: Randomized open blinded end-point trial conducted in three tertiary care hospitals in India. (Figure 1) Recruited patients and caregivers will be randomized 1:1 into intervention and control arms. (Figure 2)

Inclusion criteria:

- Adult patients admitted to Neuro-ICU, planned for discharge
- Minimum ICU stay of 3 days, regardless of ventilator requirement
- Minimum expected survival of 6 months
- Caregiver has working smartphone with internet availability

Exclusion Criteria:

- Pre-morbid patient dependancy (mRS>2) or life expectancy <3 months
- Caregivers with physical/cognitive deficits
- Unwillingness to provide consent

Results:

Primary outcome

Assess pre-and-post training caregiver burden using validated scales:

- Hospital Anxiety and Depression Scale (HADS)
- Impact of event scale - revised (IES-R)

Secondary outcome:

- Assess pre-and-post training quality of life of caregivers using EQ-5D (EuroQol 5 level version)
- Incidence of readmission to hospital within 3 months of discharge

Conclusions: Through this study we aim to provide an accessible, cost-effective mApp tool to empower caregivers of neurological patients to improve quality of patient care as well as reduce caregiver burden.

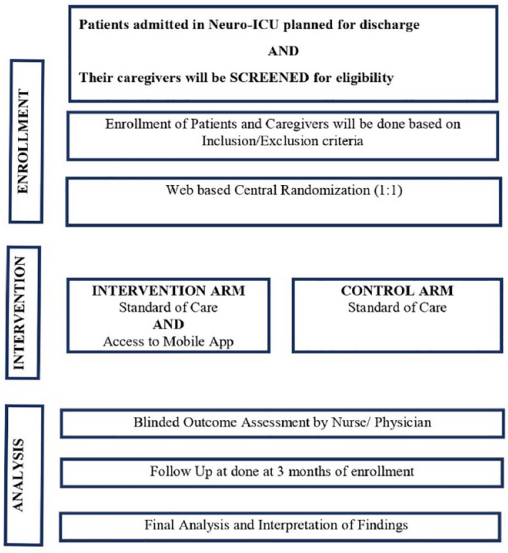

Figure 1: Methodological workflow of the study

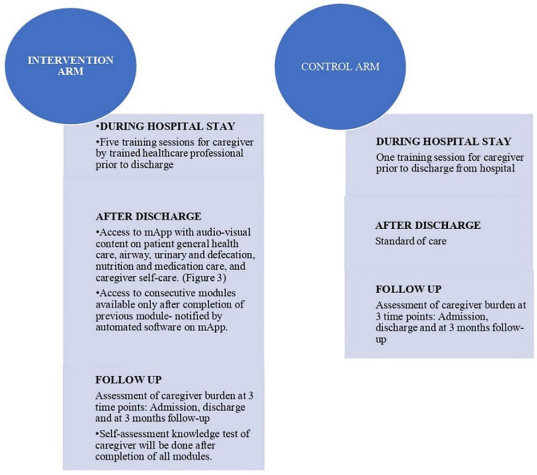

Figure 2: Process Outline in the Two arms

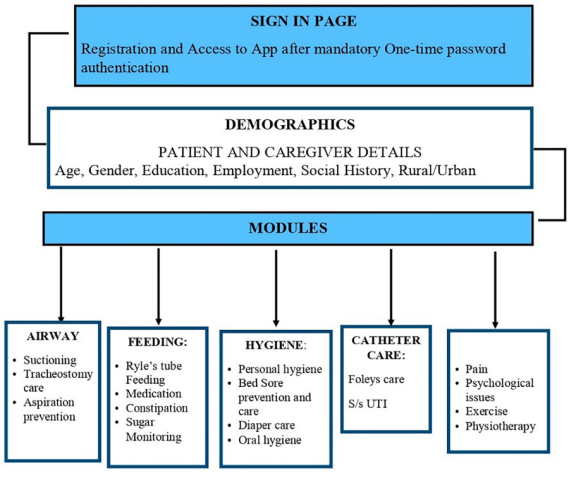

Figure 3: UML Diagram depicting the functioning flow of the mApp

Disclosure of interest: No

1127

A Re-Audit of the Ward Based IT Infrastructure of the University Hospital of Limerick

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Background and aims: IT systems play key roles in doctors jobs. Accessing imaging, blood results and discharge programmes are essential to support NCHDs in performing their daily tasks managing patients. The purpose of this re-audit was to measure accessibility of various computer programs in UHL, following identification of multiple deficits in 2021.
Methods: 91 computers were investigated across 19 wards of UHL. Nimis RIS, Nimis Pacs, iLabs, Dart, EPMS and eDischarges were programmes identified as essential by NCHDs and analysed in this re-audit cycle.
Results: 91 computers assessed, Initially 78% of computers opened nimis with only 20% opening images, this increased to 95% of computers being able to open Nimis with 95% of computers also opening imagining. 19% rose to 95% of computers accessing to Nimis Pacs. 80% rose to 94% for iLab,of which, only 16% were capable of opening DART. Only 6 out of the 19 wards surveyed had access to Pacs high resolution monitors, being no change since the previous audit. eDischarges rose from 81 to 90%, this reflected iHub with the same numbers, as access to iHub granted access to eDischarge. EPMS initially 17% rising to 20%. Additionally, unique to this audit, 18% of computers accessed to printers.
Conclusions: IT systems are essential to providing high quality, safe patient management and efficient workflow. The inability to access all necessary programs on each ward, leads to unnecessary time wasting for NCHDs. Printer connectivity and access to EPMS have significant deficits impeding NCHD efficiency and warrant dedicated ICT input.
Disclosure of interest: No

1180

IMPACT OF THE COVID-19 PANDEMIC ON THE FREQUENCY OF CONSENSUS DECISIONS, ADHERENCE TO ADVICE AND TIME TO INTERVENTION FOLLOWING A NEUROVASCULAR MULTIDISCIPLINARY MEETING

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Background and aims: Data are limited on the influence of the COVID-19 pandemic on consensus decision making at a neurovascular multidisciplinary meeting (**MDM**) in patients with extracranial carotid/vertebral stenoses.
Methods: This prospective audit/quality improvement project compared proportions of extracranial carotid stenosis patients in whom 'consensus management decisions' were reached at a weekly Neurovascular/Stroke Centre MDM in the **COVID-19 'pandemic**' (March 2020-September 2022) *vs*. **'pre-pandemic'** period (September 2017-Febuary 2020). Adherence to MDM decisions was analysed in asymptomatic carotid stenosis [ACS], symptomatic carotid stenosis [SCS] and 'indeterminate symptomatic status stenosis [ISS]' patients, including intervals between symptom onset to MDM discussion +/- intervention.
Results: Consensus regarding management was reached in 98% (97/99) of pandemic *vs*. 96.5% (111/115) of pre-pandemic patients overall (P=0.59); i.e. 98% (51/52) with SCS, 100% (23/23) with ACS, and 98% (23/24) with ISS during the pandemic. Adherence to MDM advice was observed in 91% (90/99) of pandemic *vs*. 96.4% (107/111) of pre-pandemic patients overall (P=0.10); i.e. 88% (46/52) with SCS, 96% (22/23) with ACS, and 92% (22/24) with ISS during the pandemic. In the pandemic *vs*. pre-pandemic period, the median interval from index TIA/stroke to revascularisation in 50-99% SCS patients was 11 days (IQR: 8.8-15.8d) *vs*. 12.5 days (IQR: 9-18d; P=0.30), and from MDM to revascularisation was 3 days (IQR: 1-7d) *vs*. 5.5 days (IQR: 1-7d; P=0.58).
Conclusions: The COVID-19 pandemic did not adversely influence the high frequency of inter-speciality consensus regarding management or adherence to treatment advice for carotid stenosis patients, or time intervals to revascularisation at our centre.
Disclosure of interest: No

1212

Predictors Of Discharge Against Medical Advice In Stroke Patients

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Background and aims: Stroke patients discharged against medical advice (DAMA) encompass a substantial proportion of the high-risk population in the Neurovascular Department. Regardless of their presentations and can pose a serious risk to themselves and hospital. This study examines the prevalence, demographics, stroke characteristics and clinical outcomes of a small sample of DAMA patients in a teaching university hospital.
Methods: A retrospective, descriptive cross-sectional study was conducted in the Neurovascular Department of Promedica Toledo Hospital with 7124 patient admissions. It identified confirmed stroke based on brain imaging prior to discharge during a 5-year period from July 2017 to July 2022.
Results: Of all the admitted patients, 84 patients left AMA (1.1%). 21 of these patients had confirmed stroke based on brain imaging (0.3%), with a mean age of 56.5 years. The majority were male (81.0%), Caucasian (57.1%), active smokers (69.1%). History of substance use was reported in 28.6% of the patients. Ischemic stroke was found in 85.7% of the patients, 14.3% had

hemorrhagic stroke. Neurological procedures were done in 19.0% of the patients; mechanical thrombectomy (14.2%), carotid endarterectomy (4.8%). The mean length of the hospital stay was 3.9 days. Follow-up of DAMA patients revealed that 3 (14.3%) had 90-day readmission.
Conclusions: The results serve as a pilot study to examine a relatively small sample of DAMA patient's characteristics, diagnosis, and readmissions. Facilities need further studies of the DAMA population on a larger scale to utilize this knowledge to prevent DAMA and to improve healthcare outcomes.
Disclosure of interest: No

1255

COST SAVING OF AMBULANCE SERVICE FOR SECONDARY TRANSFER OF EMERGENCY STROKE PATIENTS

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Background and aims: Endovascular Treatment (EVT) is the gold-standard treatment for Acute Ischemic Stroke (AIS) with large vessel occlusion. Prior to December 2019, when patients with AIS arrived at Changi General Hospital (CGH) Emergency Department, ambulance would be called to standby for EVT transfer as CGH does not provide such service. However, not every standby resulted in patient transfer.
From Jan to Dec 2019, 159 ambulance standbys during office hours. Base charge of S$32.10 is applied for each standby. Out of 159 cases, 24 cases (15.1%) utilized the ambulance service. Low ambulance utilization rate resulted in cost wastage.
The aim of this project is to reduce unnecessary ambulance standbys and achieve cost saving by increasing ambulance service utilization rate from 15.1% to 80% by June 2021.
Methods: PDSA cycle was used for this quality improvement project. The work process was streamlined to standby ambulance when patient was potentially eligible for EVT transfer as compared to the initial blanket standby for AIS cases.
Data were extracted from Research Electronic Data Capture from January 2019 to June 2021. Outcome measures were ambulance utilization rate and cost saving for ambulance service.
Results: Ambulance utilization rate increased from 15.1% (Jan-Dec 2019) to 81.5% (Jan-Jun 2021) and prevented 292 unnecessary ambulance standbys from Jan 2020 to Jun 2021. This resulted in a minimum cost saving of S$9373.20.
Conclusions: With the implementation of the new work process for ambulance standby, the ambulance utilization rate increased fivefold, resulting in cost-saving and resource optimization without compromising patients' care.
Disclosure of interest: No

1320

THE NEW TARGET POPULATION OF STROKE AWARENESS CAMPAIGN: KINDERGARTEN STUDENTS

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Background and aims: Thrombolysis and/or thrombectomy have been proven effective in the treatment of acute ischemic stroke, but the number of patients suitable for these treatments is low. The main limitation is the pre-hospital stage. One reason of it the loneliness of the population most prone to stroke. Among the latter, there are many grandparents who spend considerable time with their grandchildren. This gave rise to the idea of educating even younger children about the symptoms of a stroke, enabling them to call an ambulance if necessary. To this end, we adapted the Angels Initiative project previously tested in Greece. The Hungarian pilot study took place in Budapest.
Methods: We prepared with a parent meeting in the selected "test kindergarten". to engage supportive family members. The brochures for children and family were demonstrated. NAS was a collaborative partner to solve the special difficulties in prehospital transport. Due to the COVID pandemic, we reevaluated the original, live role-playing form and developed our own online version in kindergartens using the Hungarian storybook and take-home workbook.
Results: The main result was the children's emotional reaction, which took shape in spontaneous drawings of ambulances, the recurring representation of the 112 number.
Conclusions: We highly believe in this kindergarten stroke awareness campaign. The online Hungarian "Stroke Ovi" program can be an additional version of FAST Heroes project. The key of the success is the social and multidisciplinary cooperation involving neurologists, psychologists, kindergarten teachers, and parents.
Disclosure of interest: No

1433

Model-based economic evaluations in the field of stroke: a meta-research analysis

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Background and aims: Meta-research (research on research) studies help to ensure that research findings are reliable and can be used to adequately inform decision-making. Numerous economic evaluations use modelling techniques to account, among others, for the long-term effects and expenditures associated with stroke. We aimed to conduct meta-research on economic evaluations in the stroke field that use modelling techniques, by assessing the quality of the methods used.
Methods: This meta-research study examined model-based economic evaluations in the stroke field, published until 12th September 2022. Two independent reviewers assessed criteria related to methods quality and reporting practices (or lack of them).
Results: We analysed 105 model-based economic evaluations stemming from 94 manuscripts. 76 were Markov state transition models, 19 were decision tree models alone, 4 were discrete event simulation models, and 6 were other types. Although 62% of Markov models assumed a lifetime horizon, only 49% considered different stages (e.g., acute phase, long-term phase) for this condition. By accounting for different phases, it is possible to more accurately capture costs and health outcomes associated with stroke over time. Less than 5% of publications performed an external validation of their model.

Conclusions: This meta-research project provides a thorough review of modelling economic evaluations in the stroke field. Overall, we discovered that essential methods-related details are often not reported in economic evaluations and chosen methods are not always consistent. Given the importance of evaluating cost-effectiveness of medical interventions, our results are relevant for clinicians who develop clinical guidelines.
Disclosure of interest: Yes

1461

Implementing a new 12-week multi-modal education and exercise programme for TIA and non-disabling stroke

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Background and aims: Following a TIA or non-disabling stroke, previously reported support programme with a focus on feedback and motivational interviewing strategy (x8 outpatient visits over 2 years) improved secondary prevention targets but not clinical outcome. Better ways of empowering the patient through physical and mental health education, lifestyle modification and improving exercise habits are needed.
Methods: We implemented a new multi-modal programme which focused on 1) improving the understanding of stroke and its physical and mental health impact, 2) education on stroke risk factors and lifestyle modifications, and 3) exercise programme to enhance physical activity. It is a 4-way partnership between Imperial College Healthcare NHS Trust, Chelsea Football Club Foundation, The Stroke Association, and MIND Mental Health Charity. All 4 stakeholders jointly designed and delivered this programme, which takes place at the Chelsea Football Club Stadium in London. Participants with a history of TIA or non-disabling stroke were referred from the local TIA clinic.
Results: We designed a 12-week multi-modal education/exercise programme. Each week consisted of a 15-minute sharing session, followed by a 30-minute educational seminar (topics include e.g. stroke presentation, modifiable risk factors, lifestyle modifications, psycho-cognitive issues), and finally a 45-minute structured therapist-led exercise class. This holistic programme encourages a self-management approach to lifestyle change and improved physical activity. It is fun, educational and peer-supported. Patients are signposted to other community services that may help improve their function and quality of life.
Conclusions: The content, implementation and initial evaluation results of this new pilot programme will be presented.
Disclosure of interest: No

1625

LESSONS LEARNT FROM 10 YEARS OF TIA CLINIC IN A DISTRICT GENERAL HOSPITAL: OLDER PATIENTS WITH TIA SYMPTOMS PRESENT LATER TO THEIR GP

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Background and aims: The risk of early recurrent stroke in the week following a transient ischaemic attack (TIA) is 10%. Early presentation and intervention can reduce this risk by 80%. This study analysed over 10 years of data from a district general hospital TIA clinic aiming to identify barriers that patients may face in accessing care.
Methods: Data was analysed for 4,464 patients, between the ages of 16.88 and 100.71 (mean = 65.58), who attended the TIA clinic between 2011 and 2022. Multivariate linear regression was used to analyse the relationship between patient age and time to primary care presentation from TIA symptom onset.
Results: This study demonstrates a positive association between increasing patient age and the time to presentation in primary care with TIA symptoms.
Conclusions: Given the risk of early recurrent stroke following a TIA and the proven importance of early intervention in minimising this risk, the finding that older patients present later to primary care with TIA symptoms has important implications. A review of public health measures and education should be made to ensure that this age demographic is aware of the need for early presentation and prevention of delays in initiating treatment.
*Authors DR. Hannah and PR. Brian contributed equally to this work.
Disclosure of interest: No

1727

IMPACT OF THE SARS-COV2 PANDEMIC ON THE PERFORMANCE OF A REGIONAL TELESTROKE NETWORK

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Background and aims: Regional telestroke networks (RTN) have shown efficacy in acute stroke treatment. Well-organized networks may respond better to periods of crisis, such as the SARS-COV2 pandemic. Our aim was to assess the response of a RTN to the first year of this pandemic by comparing performance metrics and functional outcomes of patients admitted in different moments of pandemic activity, measured by the regional reproduction number (Rt).
Methods: We performed a retrospective multicentric cohort study including the eight hospitals of a RTN during the first year of the pandemic (24/02/2020 to 19/03/2021). For the patients transferred for endovascular treatment, we obtained performance time metrics and determined functional outcome at 90 days using the modified Rankin

Scale (mRS). The periods when Rt<1 were compared to those when Rt⩾1. Univariate and multivariate analysis using ordinal regression were performed and adjusted for confounders. Statistical significance was set for p<0.05.
Results: 262 patients were included in the analysis, with mean age of 75.2±12.29 years, 49.6% female. There were no statistically significant differences between both groups in the last-know-well-to-door interval (267.5 vs 234.9,p=0.39), in the time between admission to primary and tertiary hospital (217.9 vs 227.6,p=0.53), or in the tertiary hospital door-to-reperfusion interval (77.26 vs 76.20, p=0.89). Functional outcomes were also similar in both groups(OR1.309 [95%IC: -1.956 to 1.153,p=0.200]).
Conclusions: During the first year of the pandemic, higher Rt values were not associated with differences in the performance metrics or the functional outcomes, suggesting the importance of a pre-existing well-organized RTN.
Disclosure of interest: No

1764

The benefits and costs of good methods: a methodological appraisal of trial-based economic evaluations in stroke research literature

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Background and aims: Health economic evaluations support evidence-based decision-making. It is important that methods used in these evaluations are rigorous, or they can cause misguided resource allocation decisions, which can have negative consequences for patients and the overall healthcare system. To shed light on the methods used in study-based economic evaluations in stroke, and better understand current practices in this domain, we conducted a systematic methods review.
Methods: We carried out a systematic literature search in the databases MEDLINE and EMBASE on the 12th September 2022. Results were screened by two reviewers in a two-stage approach. Relevant information from included manuscripts was extracted using a standardised template and synthesised thematically
Results: We analysed 78 study-based economic evaluations stemming from 51 manuscripts. Among observational studies (n = 16), 44% did not report adjusting for confounding, which may result in biased estimates of the cost-effectiveness of the studied intervention. Numerous economic evaluations of all studies (45%) did not report how they handled missing data. Among the studies that specified using multiple imputation (n = 17), 35% did not report which variables were used in the imputation model.
Conclusions: We identified multiple methodological problems and a lack of transparency in the methods reporting of economic evaluations in stroke. It is critical to apply proper methods when performing health economic evaluations to guarantee that the results are credible and can be used to guide proper decision-making. Our research is an essential first step to inform recommendations on global standards for economic evaluations in stroke.
Disclosure of interest: Yes

1769

Accessibly to Thrombectomy for Acute Ischemic Stroke Patients in the UnitedStates: Mapping Acute Stroke Care Project-USA

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Background and aims: One of the key domains identified by Healthy People 2020 initiative is the relationship between people's residence and access to health care. The issue is most important in regards to acute stroke care such as thrombectomy due to time-sensitive aspects of care delivery.
Methods: We identified all acute care hospitals with >=100 from Cecil G. Sheps Center for Health Services Research (2020). We contacted all hospitals to determine if whether they provided thrombectomy for acute ischemic stroke. The population and characteristics residing in each zip code was identified. The geodesic distance between zip codes of population and that of thrombectomy performing hospitals were calculated using Haversine formula using python code.
Results: We found that 656 acute care hospitals provided thrombectomy among US hospitals with ⩾100 beds (n=1929) (1 hospital for 540,000 persons aged>20 years) with distribution of population from an MT-providing center as follows: <2 miles (36.8 million), 2-5 miles (74.1 million), 5-10 miles (61.5 million), 10-20 miles (49.9 million), 20-50 miles (59.8 million), 50-100 miles (20.4 million), and 100-200 miles (4.2 million). There are prominent differences in access for population residing in rural areas with 59% of rural and 97% of urban residents residing within 50 miles of a thrombectomy providing center.
Conclusions: There was a prominent mismatch between population needs and availability of hospitals performing thrombectomy in the US. New hospitals providing thrombectomy in selected areas and/or expedient transfer strategies are required to provide greater accessibility to thrombectomy in US.
Disclosure of interest: No

1827

EVALUATION OF STROKE QUALITY IN KYRGYZSTAN: DATA FROM RES-Q REGISTRY

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Background and aims: The Registry of Stroke Care Quality (RES-Q) in Kyrgyzstan starting from 2016 till present time implemented in Stroke Roadmap. Aim was to evaluate the quality of care provided to the stroke patients in hospitals.
Methods: For the period of January 2021- December 2022, information about 1281 patients from 8 hospitals in Kyrgyzstan has been entered in the RES-Q.
Results: The median age of patients was 64 years. Among all patients-65.4 % had ischemic stroke, 23.8% — transient ischemic attack, 13.46 % — intracerebral hemorrhage, 1.53 % — subarachnoid hemorrhage. The patients treated in stroke units -69.76 %, the rest — in intensive care units, wards of general neurology. Neuroimaging was performed in 72.56 % of patients. National Institutes of Health Stroke Scale was used to assess the severity of stroke in 92.7% of individuals (median score — 10).

In 87.2 % of patient's dysphagia test was performed. Recanalization was carried out in 3 patients- 0.23 % of persons with ischemic stroke (thrombolytic therapy).
Conclusions: Completing the RES-Q made possible to collect statistical data and reveal gaps for in-hospital stroke care: lack of CT/MRI performing, very low accessibility of thrombolytic therapy and thrombectomy and to admit that it required a significant improvement and changes in the care organization.
Disclosure of interest: No

1839

Establishment of the Stroke Center Accreditation by the Korean Stroke Society and the Current Performance Status of Stroke Centers

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Background and aims: The establishment of a well-organized care system in emergency transportation and optimal stroke center is essential for the application of scientific advances such as recanalization therapy in clinical practice. The Korean Stroke Society (KSS) began accrediting stroke units in 2008 and primary stroke centers (PSCs) in 2018. To reflect recent advancements in endovascular treatment, thrombectomy-capable stroke centers (TSCs) have been accredited since 2021.
Methods: As of November 2022, 71 TSCs and 7 PSCs have been accredited. Prior to hospital inspection, clinical performance data for the most recent year were obtained from hospitals and reviewed by two stroke expert physicians during inspection. Obstacles to establishing a stroke center in certified hospitals were also surveyed.
Results: All certified TSCs and PSCs performed an average of 41 intravenous thrombolysis and 43 thrombectomy procedures annually (Table 1). The average door-to-needle time was 50.1 minutes and door-to-puncture time was 130 minutes. The median number of beds in a stroke unit was five and median number of stroke interventionists was three. The biggest barrier to establishing a stroke center in Korea, according to 87% of certified TSCs and PSCs, was low stroke unit reimbursement by the government.
Conclusions: The successful accreditation system of PSCs and TSCs by the KSS and recent performance data of certified stroke centers suggest excellence in stroke practice in Korea. Adequate stroke unit charges are needed to promote the optimal stroke care system in Korea. In the near future, the KSS also plans to develop comprehensive stroke center accreditation.
Disclosure of interest: No

1850

STROKE SURVIVOR, FAMILY CARER AND PROFESSIONAL PRIORITIES FOR IMPROVEMENT OF STROKE SERVICES IN IRELAND: PRELIMINARY RESULTS OF A STAKEHOLDER SURVEY

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Background and aims: Exploring the views of those impacted by stroke is important for service improvement. This survey examined care priorities among stroke survivors, family carers, and professionals working across community and inpatient stroke care, and stroke advocacy, in Ireland.
Methods: A survey was carried out with three stakeholder groups - stroke survivors, family carers and professionals working in stroke care. Participants selected five priority improvements to stroke care, from a list of 45 potential service improvements. This list was based on results from an earlier qualitative study, which involved in-depth semi-structured interviews and a qualitative survey, with the same stakeholder groups. Qualitative results were combined with policy document review and consultation with a stakeholder advisory group, to generate the list of potential improvements.
Results: Preliminary survey data was collected from stroke survivors (n=30), professionals (n=39) and family carers (n=14). Three priorities were common to professionals and the survivor/carer group: (1) specialised community neuro-rehabilitation (29/83, 35%), (2) long-term community support for meaningful and beneficial activities (26/83, 31%), and (3) improved information and support for system navigation (19/83, 23%). Survivors and carers also prioritised exploring ways to improve speed of access for atypical presentations (12/44, 27%), and improved access to high-quality specialist acute care (11/44, 25%). Professionals also prioritised specialist staff recruitment and retention (11/39, 28%), and specialist inpatient rehabilitation (10/39, 26%).
Conclusions: Stakeholders consistently prioritised community-based services and long-term support for life after stroke. This likely reflects the importance of these services to survivors, and the current gaps in provision.
Disclosure of interest: No

1860

Stroke network and telemedicine: experience of the Lazio Region

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Background and aims: Telemedicine (TM) is the use of telecommunication technologies to provide medical information and service. Telemedicine has been used to improve access to care by allowing a neurologist at a remote location to interact with physicians, patients and their family member.
Telemedicine, and in particular teleconsultation, have a fundamental role in the development of the Lazio Ictus Network.
This study aimed to investigate the diffusion of TM in Lazio Stroke network and to evaluate the efficacy and safety of implementation of telemedicine in treating acute ischemic stroke patients with intravenous thrombolysis.
Methods: From 01/08/219 to 01/12/2022, 3,484 teleconsultations were requested for the Lazio Stroke Network, which resulted in 569 transfers (16.33%), 1679 no indications for transfer (48.19%), with diagnostic-therapeutic support to the requesting team and 1,070 closures of the procedure without the need for transfer (30.71%).
Results: Telestroke implementation was associated with an increased rate of thrombolytic use in remote hospitals within the telemedicine network.
Conclusions: It is essential that all possible actions are taken so that patients and health professionals can really consider telemedicine an opportunity to improve and make treatment easier and not a simple solution to limit resources.
The first results of the new training approach will be available in the 2023 regional report.
Disclosure of interest: No

1940

Understanding the implementation of stroke ESD within the context of stroke care pathways in England; a realist study of staff perspectives

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Background and aims: Stroke Early Supported Discharge (ESD) involves the co-ordinated transfer of care from hospital to home. Little is known about ESD implementation in real-world settings. We qualitatively explored how the implementation of evidence-based ESD models in England is influenced by the wider stroke care pathway within which they operate.
Methods: Under a realist approach, we explored outer-setting factors that influence ESD implementation. Six ESD case study sites in England were purposively selected. We interviewed 117 staff members including a cross-section of the multidisciplinary team, service managers and commissioners.
Results: Respondents perceived the quality of communications and transitions between services as key to the implementation of responsive and intensive ESD. Effective communication across the pathway was often undermined by historic divides between services and lack of integrated communication systems. Cross-boundary working arrangements with inpatient services helped streamline the discharge process and ensure the appropriateness of referrals. In response to the lack of appropriate services in the pathway, it was common for referrers to delay hospital discharge until their patients met ESD criteria or ESD to stretch their remit to admit patients with severe disabilities. These practices could have a negative impact on hospital length of stay and the intensity of ESD service provision.
Conclusions: Findings highlight the interdependency between ESD services and the local stroke care pathways, emphasising the need for a more integrated and comprehensive stroke service provision. Transferrable lessons can be drawn from ESD services' efforts to establish cross-service communication processes and promote information-sharing and collaboration.
Disclosure of interest: No

1953

Improving perioperative care for patients with acute stroke undergoing neurosurgery

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Background and aims: Neurosurgical teams typically practise in large, tertiary referral centres, offering lifesaving interventions on a treat-and-return basis. Postoperatively, there can be considerable delays in repatriation to the referring hospital, and for stroke patients, this can leave them without specialist stroke input at a critical time for identifying aetiology and initiating management to reduce the risk of complications and recurrence. A medical in-reach service was developed as a pilot study to improve perioperative care for complex multi-morbid patients undergoing neurosurgery.
Methods: A pilot study was established with weekly ward rounds led by consultant geriatrics and stroke physicians of patients referred by the neurosurgery multidisciplinary team. This is a retrospective case analysis of patients reviewed between November 2021 and August 2022.
Results: A total of 112 patients were reviewed. The average age for the patient cohort was 71 years old and the modal clinical frailty scale score was 6 (moderate frailty). 8% presented in an emergency setting with a cranio-vascular pathology of which 56% were intracranial haemorrhages (ICH) and 44 % subarachnoid haemorrhages. 70% of patients had polypharmacy (> 5 regular medications) and a median length of stay of 13 days. However, in ICH patients the median length of stay was 61 days, due to delayed discharge (60%) and critical illness with prolonged ICU stay (40%).
Conclusions: This pilot initiative demonstrates a need for comprehensive, specialist medical input in acute stroke patients undergoing neurosurgery. Further work is required to demonstrate the potential long-term operational and clinical benefits of this service.
Disclosure of interest: No

1965

Cost-effective analysis of evidence-based interventions underlying Acute Ischemic Stroke: A Retrospective Study of Patients in a Tertiary Care Hospital, Delhi, India

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Background and aims: As reported in 2010 annual income loss to family affected by cardiovascular diseases in India was 144-158 billion rupees. The objective of our analysis is to determine whether various evidence-based treatment strategies for acute ischemic stroke is cost-effective either for patient/healthcare system.

Methods: We intend to estimate the health benefits and costs associated with treatment of acute ischemic stroke by various treatment strategies including hospital admission, pharmaceutical therapies, radiological and surgical interventions. Outcome will be measured in QALYs (Quality of Life Years) gained. The Incremental Cost-Effectiveness Ratios (ICER) will be obtained by dividing the difference in costs by the difference in QALYs arising from various interventions.
Results: 161 retrospective patient's analysis was conducted, having mean age 55.05years, males 67.70%. The mean length of stay 13.76 days, range 1-147days, NIHSS mean 10.41, range 0-26 total and radiological investigations [Non-contrast-computerized tomography head-479, Computed Tomography Angiography-66, digital subtraction angiography-16(10%), Mechanical thrombectomy-19(11.8%), Carotid Stenting-3 Ultrasound 16(10%), X-Ray-411, Magnetic resonance imaging-78] were recorded. The follow-up showed mRS of 0-2 in (33/82)40.24%, 3-5 in (10/82)12.19% and 6 in (39/82)47.56%. The blood investigations, therapeutic procedures and medications number are recorded and is underway for analysis along with the cost analysis (DALY, QALY and ICER), further results will be updated.
Conclusions: The intervention will be considered cost-effective according to the ICER per QALY gained.
Disclosure of interest: No

1980

THE EFFECT OF A MOBILE STROKE UNIT ON HOSPITAL THROMBOLYSIS RATES IN THE PRIMARY HOSPITAL HUB

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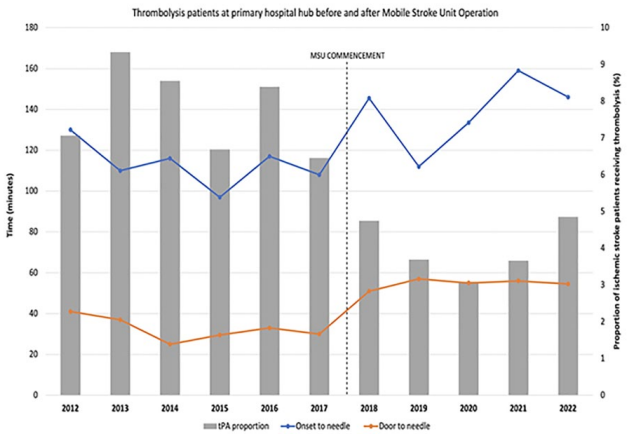
Background and aims: Mobile Stroke Units (MSUs) allow substantially faster thrombolysis by shifting treatment from hospital to the pre-hospital setting. Given MSU operation will most affect the closest stroke centers to the vehicle base, we investigated the 5-year impact of a MSU on hospital thrombolysis rates in the primary hospital hub in Melbourne, Australia.
Methods: We included data on all consecutive in-hospital thrombolysis patients at Royal Melbourne Hospital within MSU operational hours for the 5 years before and after MSU operation(2012-2022) with a focus on proportion of treated patients as well as key patient demographic and time metric variables. Statistical analysis was conducted with Chi-square or Mann-Whitney U tests where appropriate.
Results: Data were available for n=363 patients, 221 before and 142 after MSU commencement. Post-MSU operation, there was a significant decrease in the proportion of in-hospital thrombolysis for all ischemic stroke patients (16.7%vs8.7%,$p<0.001$) whereas significant increases were observed in both onset-to-needle (112.5vs144.5 min,$p<0.001$) and door-to-needle (28.5vs50.0 min, $p<0.001$) times. Baseline patient demographics, including age, baseline NIHSS, premorbid modified Rankin and proportion of concurrent thrombectomy remained largely unchanged except for lower rates of atrial fibrillation and coronary disease.
Conclusions: Melbourne MSU operation has been able to shift around 50% of thrombolysis patients presenting to the emergency department to the pre-hospital setting at the primary hospital hub with no major changes



to baseline demographics. Longer in-hospital onset-to-needle times post-MSU likely partly reflect the successful shift of earlier presenting patients to the MSU and in-hospital workflow challenges posed by the COVID-19 pandemic.
Disclosure of interest: No

1993

NOVEL MEDICAL DATA TRANSMITTING SYSTEM FOR PATIENTS TRANSFERRING FOR ENDOVASCULAR THROMBECTOMY

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Background and aims: Patients with acute ischemic stroke (AIS) who require endovascular thrombectomy (EVT) will be transferred from Primary-community-Stroke-Center (PSC) to Thrombectomy-capable-Stroke-Center (TSC). The medical records including images at PSC are copied and delivered through the patient, and the TSC doctors make decisions after the patient visits, which delays starting EVT. We report the "Stroke Fast Track" system, which could bypass the medical data delivery process.
Methods: "Stroke Fast Track" launched in March 2019. It allows medical records, including images taken at PSC, to be transmitted before the patient arrives at TSC. If the Stroke Fast Track is not used, the patient follows the previous transfer methods. TSC's stroke physicians can check images before a patient arrives, plan a treatment plan, including whether EVT is performed or not.
Results: From March 2019 to August 2022, a total of 138 patients (age, 67.4±15.1; male, 58.7%) were transferred. Among them, 31.9% used the Stroke Fast Track. Transportation time took median 52 minutes by ambulance. EVT was performed on 19 patients (13.8%) at the TSC, which took a median duration of 183 min, composed of 85 min at PSC, 48 min for transportation, and 50 min at TSC. The average door-to-puncture time of the patients who used Stroke Fast Track and those who did not were 53 minutes and 100 minutes, respectively.
Conclusions: The Stroke Fast Track system, which can transmit medical data directly and non-face-to-face before arriving at the TSC, is feasible and can be utilized to shorten the start of EVT.
Disclosure of interest: No

2073

Intracerebral hemorrhage: the neglected stepsister. Data from the RES-Q Registry in Romania

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Background and aims: The RES-Q Registry has played an important role in setting a new standard for the level of care of patients with ischemic stroke in Romania. Hemorrhagic stroke is associated with a higher mortality and although it does not benefit from a wide range of therapies, there is still progress to be made in its management.
Methods: We analyzed data from all 36 participating centers in the RES-Q Registry from Romania, starting with 2017 when the first patients were enrolled.
Results: A total of 10.600 patients were registered between 2017 and 2022, on a one month per year basis. Intracerebral hemorrhage (ICH) was registered in 1256 cases. The median age was 69 years. Mortality ranged between 36.2% and 41.7% per year, with a mean of 39.4%. Median NIHSS score at admission was 15, while median mRS score at discharge was 4.
81.8% of patients benefited of cerebral imaging within the first hour after hospital arrival. Dysphagia was screened for in 52.3% of cases. Out of the surviving patients, 80.7% were discharged at home. 70.3% of cases were classified as having a hypertensive etiology, with "other etiologies" representing 17% and anticoagulant therapy being a distant third at 7.6%. Only 1.8% of patients benefited from any neurosurgical procedure.
Conclusions: The RES-Q Registry can be a very important tool in improving the quality of care for patients with ICH. It is mandatory to implement local protocols for the diagnosis and management of ICH in line with the recommendations of international guidelines.
Disclosure of interest: No

2120

Quality of Acute Stroke Care within Emergency Medical Service System in Korea

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Background and aims: Korea recently established 70 emergency medical service areas. However, there are many concerns that medical resources for stroke could not be evenly distributed through the country. We aimed to compare the treatment quality and outcomes of acute stroke among the emergency medical service areas.
Methods: This study analyzed the data of 28,800 patients admitted in 248 hospitals which participated in the 8th stroke quality assessment by Health Insurance Review and Assessment. Individual hospitals were regrouped by emergency service areas. Assessment indicators and fatality were compared by the service areas. We defined the appropriate hospital by the performance of intravenous thrombolysis.
Results: In 7 service areas, there were no hospitals which received more than 10 stroke patients for 6 months. In 9 service areas, there were no patients who underwent intravenous thrombolysis (IVT). Among 167 designated emergency medical centers, 50 hospitals (29.9%) responded that IVT was impossible 24 hours a day. There are 97 (39.1%) hospitals that meet the definitions of appropriate hospital. In 23 service areas (32.9%) had no appropriate or feasible hospitals. The fatality of service areas with stroke centers were 6.9% within 30 days and 15.6% within 1 year from stroke onset than those without stroke centers (7.7%, 16.9% respectively).
Conclusions: There was a wide regional gap in the medical resource and the quality of treatments for acute stroke among emergency medical service areas in Korea. The poststroke fatality rate of the service areas which have stroke centers or appropriate hospitals were significantly low.
Disclosure of interest: No

2189

Development of a Digital Hub for improving emergency stroke care and introducing quality indicators to evaluate its impact: the CAEHR project

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Background and aims: Fast and secure transfer of imaging and clinical data between emergency medical services (EMS), regional hospitals and stroke centers is essential for acute stroke treatment. We present the design of a Digital Hub to improve availability of time-critical diagnostic information in the acute stroke by digital tools and describe the development of indicators for measuring quality of emergency stroke care
Methods: In the Digital Hub CAEHR (Cardiovascular Diseases – Enhancing Healthcare through cross-Sectoral Routine data integration), interfaces for automatic transfer of routine data from EMS, regional hospitals and telemedical consultations with a tertiary stroke center in Germany were developed. For evaluating the impact of these tools on quality of acute stroke care, a multidisciplinary working group developed evidence-based quality indicators (QI) considering (inter-)national recommendations including a literature review, an independent evaluation by a multidisciplinary sounding board and a pilot phase.
Results: Solutions for digital interfaces between routine EMS documentation by tablets (NIDA® Pad, medTV) and telemedical consultations platform (VIMED®, MEYTEC) with the hospital information system were developed. A set of 25 QIs was developed to measure quality of emergency stroke care including patient-reported outcomes (EQ5D-5L, PROMIS-29, PHQ-4). In the pilot phase, 25 patients were documented; average age was 68.8 years, 28% were women; the follow-up rate was 80%. The QI documentation was rated to be feasible and useful by professionals and patients.
Conclusions: The digital hub CAHER aims to improve the timely provision of intersectoral health information. The impact of its implementation will be evaluated by predefined QI.
Disclosure of interest: No

2425

MANAGEMENT AND EPIDEMIOLOGY OF TIAS IN TRIESTE PROVINCE: A 5 YEARS RETROSPECTIVE STUDY

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Background and aims: TIA (Transitory ischemic attack) is defined as a brief episode of neurological dysfunction caused by a focal disturbance of brain or retinal ischemia lasting less than 24 hours. It is known a higher incidence of stroke after TIA with the greatest risk of stroke occurring in the first week. Current practice guidelines advise evaluation through rapid access clinics or through admission to hospital. We provide data on TIA incidence in Trieste and management of patients with TIA including the incidence of relapses.

Methods: This is a 5-year retrospective study of all transient cerebrovascular events admitted in the ED (emergency departement) and outpatients in the district of Trieste (230000 inhabitants), between January 1, 2017 and December 31 2021.

Results: We studied 1036 patients referred to the ED/outpatient for a focal neurological deficit. We exclude patients who come from others districts and patients with a confirmed minor stroke. Between the remaining 875, 496 had only a ED evaluation, 379 patients were admitted in our DH TIA (Day hospital TIA) between 24 and 96 hours on average from access to the ED. Were defined as confirmed TIA altogether 574 cases (incidence crude rate of 0.49/1000 inhabitants). The recurrence rate of cerebrovascular disease was 2% within 90 days and 6% beyond 90 days after a DH evaluation, 7% and 10% respectively in patients evaluated in ED ($p<0.05$).

Conclusions: The correct management of patients with TIA is still challenging. This study improves new data on TIA incidence and prognosis in Trieste.

Table 1 – Demographic and clinical features of 574 confirmed TIA in with DH and ED evaluation.

Patients' characteristics	Overall (574 pt)	ED (305 pt)	DH (269 pt)
Age (years)	74.3 ± 14	79.5 ± 11.8	69 ± 14.5
Sex, n (%)			
Male (M)	275 (48%)	135 (44%)	140 (52%)
Female (F)	299 (52%)	170 (56%)	129 (48%)
Age (y)			
0-44	22 (4%)	5 (2%)	17 (6%)
45-54	37 (6%)	6 (2%)	31 (12%)
55-64	63 (11%)	21 (7%)	42 (16%)
65-74	113 (20%)	53 (17%)	60 (22%)
75-84	194 (34%)	107 (35%)	87 (32%)
>85	145 (25%)	113 (37%)	32 (12%)
Year of admission			
2017	137 (24%)	78 (26%)	59 (22%)
2018	108 (18%)	54 (18%)	54 (20%)
2019	113 (20%)	55 (18%)	58 (22%)
2020	97 (17%)	56 (18%)	41 (15%)
2021	119 (21%)	62 (20%)	57 (21%)

Table 2 - TIA recurrence < 90 days

Patients' characteristics	Overall (574 pt)	No DH (305 pt)	DH (269 pt)	p value
Recurrence rate < 90 days	28 (5%)	22 (7%)	6 (2%)	p=0.006
Recurrence rate > 90 days	48 (8%)	32 (10%)	16 (6%)	p<0.05

Disclosure of interest: No

2477

Home blood pressure monitoring in ischaemic stroke patients recently discharged on anticoagulation for atrial fibrillation

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Background and aims: High blood pressure (BP) is the main modifiable risk factor for intracerebral haemorrhage in patients with atrial fibrillation (AF) on oral anticoagulation after ischaemic stroke (IS). We sought to establish whether patients recall education about BP in hospital, whether they use home monitors and keep a record of BP.

Methods: We prospectively collected data on consecutive IS discharges on anticoagulation for AF from a tertiary stroke unit (1/7/22 to 31/12/22). Patients were telephoned within two-weeks of discharge to establish if they

recall of education about BP pre-discharge, which is part of routine care have access to home BP monitoring and can share readings.

Values were compared to those 72h pre-discharge.

Results: 79 cases were identified - 39 excluded (Table 1); 40 were contacted (median 14days (IQR;14-17). 23 (58%) knew why anticoagulation was prescribed and 10 (25%) recalled BP information.

13 of 23 (58%) used a monitor; 2 weekly, 4xdaily and 7 twice-daily, 9/13 kept records. (Table 2).

11 monitored BP at least daily, 3 had maximum SBP<130mmHg and 6 had average SBP<130mmHg (Figure 1). None had a post-discharge primary care review.

Conclusions: Few patients measured/recorded BP and fewer still had adequate BP control. Improved hospital education but crucially early follow-up could prevent adverse effects of hypertension in anticoagulated patients. Non-physician practitioners might improve care in this patient group.

Table 1. Reasons for exclusion, *may have more than 1 reason.

Reason for exclusion*	n
Advanced disability (mRs >3) or dementia	12
Limited life expectancy	8
Advanced age where BP guidance may not be appropriate	8
Discharged to care home	8
Missing BP data	3
Re-admitted within 2 weeks	2

Table 2. Home BP monitoring results.

	N (%)
Followed up via telephone call	40
Median age years (IQR)	80 (73-83)
Female (%)	14 (35)
Median time to telephone call (days)	14 (14-17)
Median CHA_2DSVAS_2C	4.5 (3-6)
Pre-existing hypertension	28 (70)
Remained hypertensive at discharge*	16 (40)
Telephone discussion	
Knows that they are on anticoagulation	34 (85)
Able to tell reason why taking anticoagulation	23 (58)
Recalls education on importance of blood pressure	10 (25)
Has BP monitor	23 (58)
Monitored BP since discharge	13
Monitored at least once a day	11
BP diary kept	9
GP review of BP planned	8 (20)
GP review carried out	0

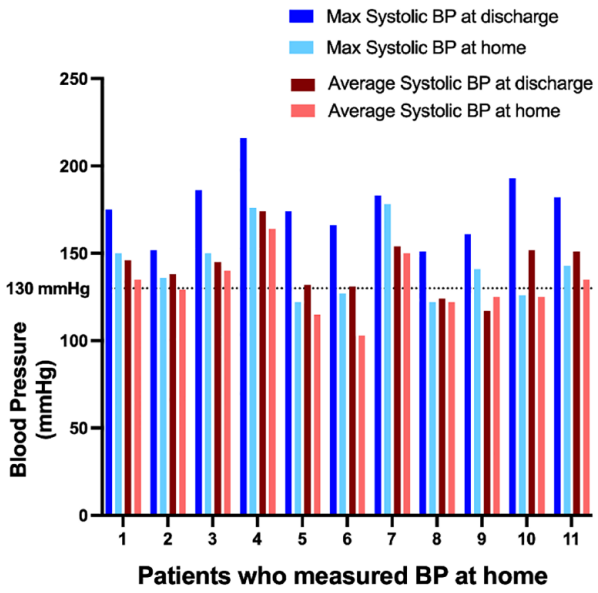

Figure 1. Comparison of BP at discharge and at home.

Disclosure of interest: No

2500

POST-STROKE FATIGUE: INCIDENCE, PREDICTORS AND ASSOCIATION WITH OTHER REPORTED HEALTH OUTCOMES

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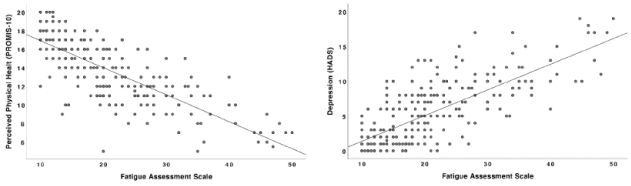
Background and aims: Post-stroke fatigue (PSF) has a negative impact on quality of live. We aimed to assess the prevalence and predictors of PSF three months after stroke, and its association with other patient-reported outcomes (PROMs).
Methods: We included consecutive stroke survivors from October-2021 to October-2022 in 5 hospitals that participated HARMONICS (a EU-funded High-value Stroke care project in Catalonia), which implements a PROMs-through-App program (NORA, NoraHealth Barcelona Spain). PSF was assessed three months after stroke with the Fatigue Assessment Scale (FAS), categorized into normal (0-21), fatigue (22-34) and extreme fatigue (>34). Predictors of PSF were explored by logistic regression. Bivariate correlations were explored with other PROMs, such as Hospital Anxiety and Depression Scale (HADS), PROMIS-10 Global Health survey.
Results: Of 2164 consecutive patients, data on FAS were obtained in 384. Of them, 98(25.5%) reported fatigue and 34(8.9%) extreme fatigue. Patients reporting PSF were more frequently female and had more severe and disabling strokes. Patients with previous stroke had higher rates of PSF. PSF was not associated with age, risk factors or pre-existing anxiety-depression. In logistic regression, female sex (OR 1.77 (1.11-2-82)), modified Rankin Scale at discharge (OR 1.28 (1.06-1.55)) and previous stroke (OR 1.85 (1.03-3.24)) were independent predictors of post-stoke fatigue. FAS correlated with all other PROMs, especially physical health (R=-0.79, $p<0.0001$) and depression (R=0.73, $p<0.001$) (figure).



Conclusions: PSF is common after stroke and more frequent in disabling strokes and women. Our results point to different self-perceived health status after stroke depending on gender, with deserves further research.
Disclosure of interest: No

2558

Sierra Leoneans nurses trained in stroke recognition and assessment are the pioneers for the establishment of the first stroke registry in Bo's Government Hospital

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Background and aims: Like other Sub-Saharan countries Sierra Leone is seeing an increasing incidence in the number of stroke cases, however, is difficult to obtain numbers reflecting the real picture as data collection is a challenge in a reality with minimal resources.
Most of the population lack knowledge regarding stroke, primary prevention is poor, access to secondary care is difficult and expensive, therefore most of the stroke cases remain unrecognized and untreated.
The registry is an useful tool to provide reliable data for future research and the development of a local and national stroke pathway. With a chronic shortage of medical staff and community health officers, nurses are a valuable resource to lead this initiative.
Methods: Cambridge Global Health Partnership in collaboration with local nursing leaders established a stroke training nursing program in Bo's hospital. The partnership included public awareness campaigns, the placement of a long-term volunteer at site and ongoing monthly online stroke sessions.
Results: Despite several barriers such as lack of electricity and internet, poor awareness, limited knowledge and cultural resistance, reliable stroke data, based on the UK SSNAP (Stroke Sentinel National Program) model, has been collected for the last two years in Bo's Government Hospital.
The data reflects the systematic use of the NIHSS (National Institute of Health Stroke Scale) tool, early swallow assessment, risk factors, time of presentation, assessment, management, and outcomes.
Conclusions: Developing a stroke registry allows future monitoring of the improvement in care and skilled nurses can hugely contribute to data collection.
Disclosure of interest: No

TECHNOLOGY INNOVATIONS: ROBOTS, VIRTUAL REALITY, ARTIFICIAL INTELLIGENCE AND MORE

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Maximum Euclidean Deflection: A Novel Metric For Safety Of Neurovascular Devices In An In-vitro Stroke Model

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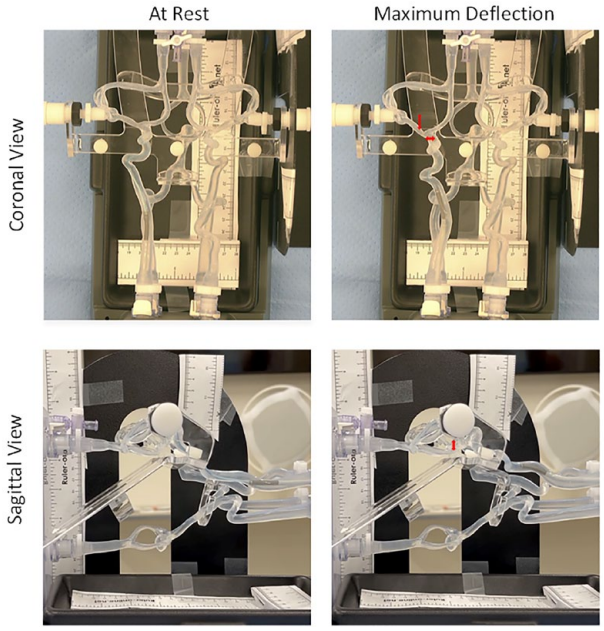
Background and aims: Endovascular thrombectomy (EVT) devices are evolving rapidly to improve safety/efficacy of EVT-mediated recanalization of large vessel occlusion strokes, and to access medium/distal vessel occlusions. To enable effective comparative analyses, there is a need to develop an objective in-vitro safety metric for new EVT devices.

Methods: We utilized three FDA-approved stent-retrievers currently available in the US and deployed them in an in-vitro ischemic stroke bench model (Sim Agility,Mentice). The stent-retrievers were deployed in the M1-segment of the middle cerebral artery using a system comprised of an 0.014inch guidewire and 0.021inch microcatheter. After unsheathing in M1-segment, the microcatheter was withdrawn back into the petrous internal carotid artery, and the whole system was withdrawn as a rate of 5mm/second. Maximum deflection of the terminal internal carotid was measured in 3 axes using a specialized camera set-up.

	Maximum deflection of the internal carotid artery terminus from baseline (mm)			
	Coronal plane (Supero-inferior)	Coronal plane (Medio-lateral)	Sagittal plane (Antero-posterior)	Euclidean deflection
Stent A	8 mm	3 mm	3 mm	9.1 mm
Stent B	6 mm	2 mm	2 mm	6.6 mm
Stent C	8 mm	3 mm	3 mm	9.1 mm



Results: A total of 3 passes were performed for each stent-retriever (stent-A, stent-B, stent-C). Maximum deflection of the terminal internal carotid artery (from resting position to largest displacement during stent-retriever withdrawal) was measured in 3 planes (values in Table). Maximum Euclidean Deflection (MED) ranged from 6.1 to 9.1 mm. Deflection varied substantially. Figure demonstrates deflections as seen in Stent A.

Conclusions: Withdrawing an unsheathed stent-retriever from the middle cerebral artery leads to significant deflection of the internal carotid artery terminus in an in-vitro stroke model. The degree of deflection is variable in different planes and varies based on stent-retriever design. Maximum Euclidean Deflection (MED) is a potential in-vitro metric for EVT devices.

Disclosure of interest: No

474

Providing a co-ordinated, connected world for all stroke survivors and their families through a personalised, co-created digital support package: 'My Stroke Companion'

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Background and aims: Many stroke survivors lack a comprehensive understanding of their diagnosis, care plan, or treatment. Patients, therefore, have less control over their care and are at higher risk of non-compliance to treatment regimes, increasing stroke recurrence risk and long-term disability.

'My Stroke Companion' was co-created alongside University College London Hospital, charities, stroke survivors and their families as an accessible digital support package (DSP), designed to provide personalised, reliable, and localised information to stroke survivors and their families, including about type of stroke, prescribed medications, rehabilitation, and navigating life after stroke.

This work aimed to measure patient response to the DSP following discharge from hospital after stroke by analysing use of the tool and from a simple patient feedback questionnaire. Clinician feedback was also captured.

Methods: We piloted "prescription" of the first iteration of the DSP to selected patients presenting to the UCLH Comprehensive Stroke Service over a four-week period.

Results: During the pilot phase, 57 people accessed the tool with a 13-minute average session duration, compared against a 2-minute industry standard. The most viewed information related to type of stroke. Patients felt their understanding of their stroke and subsequent care plan increased after using the hub, and feedback from clinicians was favourable, noting direct benefit to patient recovery.

Conclusions: Patient information following stroke should be accurate, tailored, and accessible. Pilot data from the My Stroke Companion tool suggests the benefit of patients accessing the digital content. Further development of this system and detailed evaluation are now in progress.

Disclosure of interest: No

897

Delivery of a national programme of Stroke Prehospital video Triage (Stroke PvT) in England

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Background and aims: Rapid access to evidence-based stroke care is vital to reduce mortality and disability. Over 50% of patients with stroke like symptoms have alternative non-stroke diagnosis (mimics). Improving the sensitivity and specificity of the prehospital assessment is pivotal. Stroke PvT encompassing ambulance clinicians using videoconferencing to connect to stroke specialists with joint decision making as to who to convey to a specialist stroke unit, to a more local emergency department, or stay at home with other outpatient follow up arrangements made.
We report, following the successful introduction of Stroke PvT in 2 areas of England in 2020, a national programme to deliver Stroke PvT to 8 additional regions in England (covering 10,000,000).
Methods: Following a formal assessment process, 8 regions were awarded central, fixed term funding, to introduce Stroke PvT. Criteria for inclusion included: ambulance / secondary stroke care 'buy in', reducing inequalities, evaluation.
Establishment of a regular Community of Practice (CoP) of pilot sites, fostering an active community of focused practitioners with a shared vision, overseen by regular central progress review monitoring.
Results:

- Both 'Face time' and 'GoodSAM' video conferencing apps used equally
- FASTO score used to initiate referral
- Both nurse and doctor led specialist opinion models used
- Poor connectivity reported in 2 regions delaying assessment

Further evaluation results available May 2023:

- Symptom-to-hospital-arrival time
- hospital-arrival-to-treatment time
- sensitivity and sensitivity
- patient / staff experience

Conclusions: Stroke PvT appears safe and deliverable. Several platforms are available. Connectivity, ambulance and secondary care engagement are pivotal to national delivery.
Disclosure of interest: No

1801

Impact Of An Automated Neuroimaging Triage Platform On Door-To-Groin Puncture Times At A Comprehensive Stroke Center

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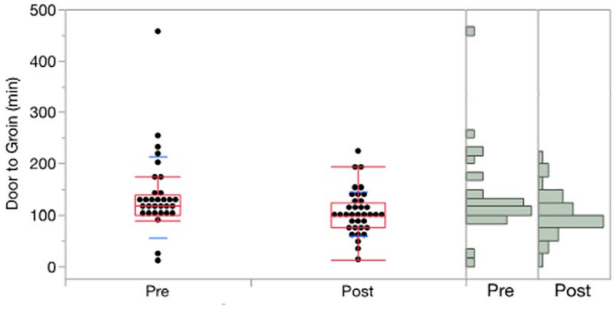
Background and aims: Rapid detection and appropriate triage of large vessel occlusion (LVO) strokes, upon arrival to a hospital system, is key to achieving better outcomes after endovascular thrombectomy (EVT) mediated recanalization of LVO strokes. Automated neuroimaging analyses has the potential to streamline intra-hospital workflow. We aim to study the change in vital intra-hospital time metrics before and after adoption of an automated neuroimaging triage platform.
Methods: We performed a retrospective analysis of prospectively collected data at our EVT capable stroke center between April2019-November2021. IschemaView's Rapid automated LVO triage software was adopted in October2020 for triage of stroke patients. Patients treated before this date were our control cohort and after were our intervention cohort. Confirmed LVO strokes presenting directly to our center within 24 hours of stroke onset were included. We used the Wilcoxon non-parametric test (rank sum test) to compare the pre and post values.
Results: A total of 66 patients presented directly to our thrombectomy center- control (n=31) and intervention cohort (n=36). Age, NIHSS score, last-known-well to arrival, and arrival to non-contrast CT head were comparable between the two groups. Door to groin puncture was shorter in the intervention cohort compared to control cohort by 20.5 minutes, p=0.016 (control cohort median=118 minutes, intervention cohort median=97.5 minutes)(Figure).
Conclusions: Automated neuroimaging triage platform has the potential to improve workflow by decreasing time from door to groin puncture. Further studies are required to study impact on patient outcomes.

Figure. Comparison of Door-to-groin Puncture Times



Disclosure of interest: No

1815

Clinical Data-based Cerebral Infarction Subtype Classification using Machine Learning

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Background and aims: Cerebral infarction (CI) is difficult to recover from, so it is important to measure the risk score of CI in advance and to be careful of the onset. CI subtype identification is also important because the subtypes affect the treatment and prognosis. However, there is no system for the general public to measure the risk of CI and predict potential CI subtypes. Machine learning (ML) has been successfully applied to various clinical fields. Therefore, in this study, we applied ML to predict CI subtypes using clinical data.
Methods: We collected 709 CI patients' data with 22 clinical features from Kangwon National University Hospital and their Trial of ORG 10172 in Acute Stroke Treatment (TOAST) class annotations. We labeled the Large Artery Atherosclerosis and Small Vessel Occlusion subtypes as positive classes and the Cardiac Embolism subtype as a negative class, and six ML models are trained to predict the TOAST classes of patients.
Results: As a result, RF achieves the best F1 score of 0.8824. Additionally, SHapley Additive exPlanations (SHAP) analysis shows the importance of each feature in the RF model. For example, bp, which is a difference between systolic and relieving pressure values, has the highest SHAP value and it can be interpreted that the probability of a sample being in the positive class increases as the bp increases.
Conclusions: This study shows that ML models are able to classify CI subtypes and the SHAP analysis can identify CI subtype-related important features.
Disclosure of interest: No

1830

Hungarian Experiences with Artificial Intelligence-based Decision Supporting System in Acute Stroke Management

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Background and aims: A nationwide stroke imaging network (eRAD-BB, Hungary), powered by Artificial Intelligence (Brainomix Ltd., UK), has been installed in Hungary as of October 2022. We studied if the application of this system improves patient selection and transportation time.
Methods: All patients admitted to the National Institute of Mental Health, Neurology and Neurosurgery (NIMNN) for mechanical thrombectomy (MT) due to large vessel occlusion (LVO)-related acute ischemic stroke between 03-10-2022 and 03-01-2023 from a population of 3 million were included in the analysis. In the first group of patients the AI-based decision supporting system was used (AI+, 52 cases), while in the other it was not used (AI-,52 cases). Effectiveness of the decision supporting system was evaluated by two indicators: 1, transportation time measured as the time between the first CT in the primary center and the control scan upon arrival at NIMNN, and 2, the rate of completion of MT. Data were analysed using retrospective and prospective methods. For statistical analysis we used T-test and Chi-square probe.
Results: Anterior circulation LVO was found in 96% and 94% in the AI+ and AI- groups, respectively. Intravenous thrombolysis was performed in 63% and 58%, and mean transportation time was 129±51 minutes vs. 138±53 minutes (p=0.412). MT was completed in 75% vs. 56% (p=0.039).
Conclusions: Despite the lack of significant reduction in transportation time, the application of the AI-based decision supporting system significantly improved patient selection for MT, helping more patients receive appropriate therapy.
Disclosure of interest: No

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WEARABLE ELECTRONICS FOR DETECTING DYSPHAGIA IN STROKE PATIENTS

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Background and aims: Dysphagia is a common problem observed in stroke patients, around~50% of the stroke survivors suffer from swallowing dysfunction. Some patients are able to recover from this condition, however, in around 11-13% patients the problem persists. Patients with swallowing dysfunction are susceptible to developing other detrimental conditions like aspiration pneumonia, enhanced mortality rates in stroke survivors with dysphagia, dehydration and malnutrition. Therefore, it is crucial to develop a device for rapid diagnosis and management of dysphagia and prevent further associated complications.
Methods: This is an exploratory study to develop a non-invasive, wearable diagnostic biomedical device for assessing swallowing dysfunction in stroke patients and to determine its diagnostic accuracy. Inclusion criteria for the study will be; both males and females, age between 18-80 years, persistent swallowing difficulty in ischemic or haemorrhagic stroke patients from two weeks of onset of stroke or beyond. We aim at developing a non-invasive biomedical device consisting of two major components – data acquisition and algorithm/software. The findings of our tool shall be compared with video-fluoroscopy (VFS) and clinical bed-side evaluation of patients to understand the accuracy of our tool.
Results: This is an ongoing trial.
Conclusions: The main aim of our study is the development of non-invasive wearable device which can detect swallowing dysfunction in patients of stroke and to determine its diagnostic accuracy. Through the study we shall also try to deduce the efficacy of the device in terms of reduction in incidence of aspiration pneumonia and mortality and other related side effects.
Disclosure of interest: No

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ROLE OF TELESTROKE IN ACUTE STROKE CARE: PILOT EXPERIENCE IN PRIVATE CARE IN BRAZIL

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Background and aims: Stroke remains the second cause of death and disabilitity in Latin America, despite efforts to reducing the burden of this disease. In a country like Brazil, the access to specialized care is an important health problem. Our objective is to evaluate teleneurology impact

care during and after the SARS-CoV-2 pandemic between 2019 and 2022 in a private health system in Brazil.
Methods: Medical records from patients diagnosed with stroke admitted through telemedicine neurology consults from 2020 to 2022. An analysis based on year and costs related to the hospitalization and compared data to overall costs within the health network.
Results: 1,545 teleneurology consultations were performed in the period. Were 44.4% males, the mean age was 65.8 (±0.4) years. 2,102 patients were hospitalized in our health system; 58% from those were assisted by teleneurology. The in-hospital costs of all hospitalized stroke patients were U$1345 (±105) in 2021 and U$1260 (±76) in 2022. The in-hospital costs per patient ranged from U$1,266 (±) in 2020, U$1,141 (±) in 2021 and 1,367 (±) in 2022 ($p<0.001$). Adjusting by health inflationary index (IPCA), patients assisted by teleneurology averaged in-hospital costs lower than expected in 2021 (-17%), but higher in 2022 (+8.6%). In an accumulative analysis, the costs reduced in 13.2%, in the period 2020-2022.
Conclusions: Teleneurology consults enabled increasing access to neurology care and, in the period, they were implemented, acted as a way to minimize overall hospitalization costs despite a likely repressed demand imposed by the covid 19 pandemics.
Disclosure of interest: No

CASE REPORTS

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Middle meningeal artery embolization for chronic subdural hematoma: a case report

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Background and aims: We present a case of chronic subdural hematoma refractory to burr hole surgery treated successfully with middle meningeal artery embolization.
Methods: 61-year-old gentleman presented with a history of headaches and single episodes of vomiting. Neurological examination was normal. A non-contrast computed tomography (CT) scan of the head showed chronic subdural hematoma with midline shift. The patient was managed with burr hole surgery but there was no improvement in the symptoms and CT findings of recollection of blood in subdural space. The patient was then managed endovascularly with embolization of the middle meningeal artery (MMA), patient recovered fully after the endovascular treatment.
Results: Chronic subdural hematoma can present clinically with vomiting and headache, if refractory to burr hole surgery it can be managed with the embolization of the middle meningeal artery.
Conclusions: Subdural hematoma can be successfully managed by endovascular treatment at LMIC.
Disclosure of interest: No

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CRYPTOGENETIC STROKE FROM PARADOXICAL EMBOLISM IN YOUNG PATIENT WITH MULTIPLE PULMONARY ARTERO-VENOUS MALFORMATIONS AND CLINICALLY DEFINITE HEREDITARY HEMORRAGIC TELEANGECTASIA: A CASE REPORT

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Background and aims: Pulmonary arteriovenous malformations (PAMVs) are pathological ducts directly connecting the pulmonary artery and vein without interposition of capillary bed, resulting in a continuous left-to-right shunt (LRS). More than 80% of PAMVs are congenital and related to Hereditary Hemorrhagic Telangiectasia (HHT). Clinically manifest or silent ischemic stroke from paradoxical embolism is the major complication.
Methods: Case report and literature review.
Results: We report the case of a 43-year-old male patient with imbalance, left paresthesias and weakness, and a history of migraine with aura, epistaxis and low oxygen saturation levels.
Brain CT scan revealed a right parieto-occipital ischemic lesion confirmed by brain MRI, which showed other recent ischemic lesions in the right hemisphere and in the right cerebellum. Cardiac monitoring, thrombophilic and autoimmune screening were unremarkable. Chest CT-angiography demonstrated the presence of five bilateral PAVMs, with evidence of RLS on contrast transthoracic echocardiography. Anticoagulation therapy was started after discovering a thrombosis of the right saphenous vein. Thereafter, the patient underwent endovascular PAVM embolization treatment and was addressed to a referral centre for HHT, for genetic testing and counselling.
Conclusions: It is important to investigate the presence of PAVMs in cases of cryptogenic stroke, since PAVMs can be treated to prevent stroke recurrence. Since most PAVMs are related to HHT, it is important that neurologists keep in mind this pathology and associated signs and symptoms. Currently there is a lack of guidelines about acute reperfusion treatments or secondary stroke prophylactic measures in the PAVM population, so further studies are needed.
Disclosure of interest: No

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Rare non-vascular causes of carotid dissection not to be missed

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Background and aims: Carotid artery dissection (CAD) is one of the rare causes of ischemic stroke especially in young patients. The incidence of stroke caused by CAD is about 2.6–2.9 per 100 000 cases of CAD. Eagle's syndrome is associated with an elongated styloid process that compresses the cervical internal carotid artery which may cause CAD. However, the elongated styloid process occurs in about 4% of the general population, only about 4% of them are symptomatic; therefore, the true incidence is about 0.16%. Knowing the etiology behind the CAD is important to treat the cause if curable.
Methods: A 68-year-old patient, known to have AF, TIA and rheumatoid arthritis, presented to the stroke services at West Suffolk hospital on three different occasions in 2022. Each time he had a new infarct in the right cerebral hemisphere which was confirmed by MRI scans despite adequate anticoagulation. Repeated CT angiograms were done.
Results: CT angiogram confirmed right ICA dissection and elongated styloid process in the right site, suspecting Eagle's syndrome.
Conclusions: However, the patient is known to have AF, the recurrent strokes in this case likely caused by CAD because all of them happened in the same arterial territory. Getting the correct diagnosis and focused treatment are very important to minimize the recurrence rate of stroke. Management of Eagle's syndrome needs an MDT approach and the surgeon needs to be experienced in the styloidectomy procedure. The surgical approach is curable and can help the patient to live his life as normal.
Disclosure of interest: No

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INFLAMMATORY CEREBRAL AMYLOID ANGIOPATHY WITH RAPID AND COMPLETE RESPONSE TO STEROIDS

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Background and aims: Cerebral amyloid angiopathy-related inflammation (CAA-ri) occurs in a subset of patients with cerebral amyloid angiopathy (CAA) and is potentially reversible with immunosuppressant therapy. Imaging usually shows cortical and subcortical haemorrhagic lesions, and white matter hyperintensities, best seen on T2-weighted sequences.
Methods: N/A
Results: We present an 82-year-old man with acute confusion and visual disturbance, progressing within hours to complete aphasia, cortical blindness and an isolated generalised tonic clonic seizure.
CT head imaging showed parietal white matter hypoattenuation and bilateral occipital loss of grey-white matter differentiation.
MRI revealed multifocal subcortical white matter changes and multiple cortical microbleeds. He was managed as posterior reversible encephalopathy syndrome (PRES) with blood pressure control and anti-epileptic medication.
MRI 10 days later showed worsening oedema, prompting consideration of CAA-ri and prednisolone 40mg was started.
Two months later, MRI showed resolution of extensive vasogenic oedema with stable cortical micro bleeds consistent with significantly improved, resolving CAA-ri. The patient had made a complete recovery with no residual deficit.
Conclusions: This patient presented with confusion, seizure and cortical blindness. The diagnosis of CAA-ri was only considered after MRI failed to improve.
Disclosure of interest: No

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Methotrexate-related Leukoencephalopathy Presenting as Stroke Mimic

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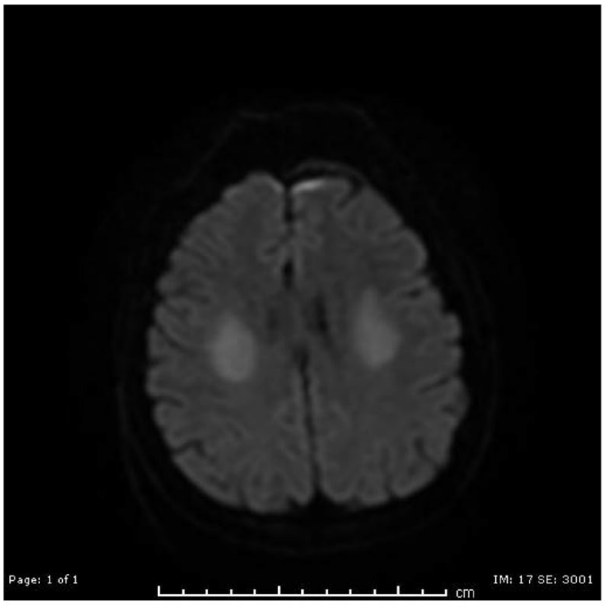
Background and aims: Manifestation of nonvascular disease with stroke like clinical picture comprise about 9-31% of cases in suspected acute stroke population. Stroke mimics may be part of the symptomatology of a neurological or medical disorder.
Methods: We report a case of an 18 year old male who presented with non-traumatic intermittent bilateral leg pain that radiated to the lower back in October 2022. His pain worsened requiring morphine. Thoracic MRI revealed diffuse hypointense signal on T1, mixed hypointense signal on T2 of the vertebral column. Stir sequences showed heterogenous



appearance of the marrow with hypo, hyper and isointense foci. Given the above, he underwent lumbar puncture. Flow cytometry revealed mature B appearing neoplastic cells. Diagnosis of Burkitt's lymphoma was made. He underwent induction chemotherapy with R-COPADM (Rituximab, Cyclophosphamide, Vincristine, Prednisone, Doxorubicine, Methotrexate). On November 25, 2022 he was admitted for neutropenic fever and mucositis. A few days later he developed an acute onset of left arm weakness, aphasia and confusion prompting concern for acute stroke.
Results: CT angiography and CT perfusion were unremarkable. MRI of the brain with and without gadolinium revealed restricted diffusion at the corona radiata, centrum semiovale bilaterally. The right measured 2.5 cm and left measuring up to 1.7 cm respectively.
Conclusions: Given the clinical history, imaging findings are suggestive of toxic leukoencephalopathy secondary to methotrexate.
Disclosure of interest: No

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Radiotherapy induced vertebral artery origin stenosis resulted in subclavian-vertebral artery steal syndrome treated with angioplasty and stenting

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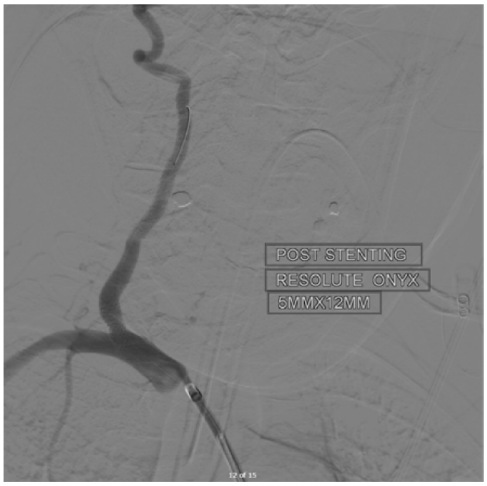
Background and aims: Subclavian-vertebral artery steal phenomenon is a well described condition that happens when a proximal occlusion of the subclavian artery leads to flow reversal within the vertebral artery and subsequently potential vertebrobasilar ischemia. Several reported cases had attributed it to atherosclerosis.
Methods: We report a case of a 51-year-old female with a background history of hypertension and nasopharyngeal carcinoma treated with chemotherapy and radiotherapy. She presented with a 3-year history of episodes of dizziness and syncope that were triggered with standing and raising arm above the head and were relieved by sitting and lying flat.
Results: CTA head and neck showed right vertebral artery origin stenosis and left vertebral artery V1 segment non-visualization while the remaining artery was hypoplastic. It was concluded that the patient's symptoms were provoked by bilateral vertebral artery insufficiency superimposed by right subclavian-vertebral artery steal phenomenon.

Before the stenting.



After the stenting.

Furthermore, it was hypothesized that the radiotherapy she received earlier contributed largely to the vasculopathy she had. The patient underwent vertebral artery origin stenting and had a remarkable recovery. Follow up imaging showed that the stent is patent, and no further symptoms have developed.
Conclusions: This case highlights the importance of meticulous reading of radiological images and correlating them with the patient's history. Subclavian-vertebral artery steal syndrome although uncommon is still an important differential that should be considered in the right context.
Disclosure of interest: No

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CEREBRAL HYPERPERFUSION SYNDROME ASSOCIATED WITH ISOLATED SUBARACHNOID HAEMORRHAGE FOLLOWING CAROTID ENDARTERECTOMY

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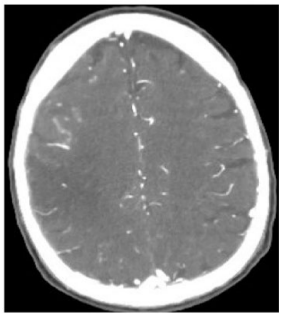
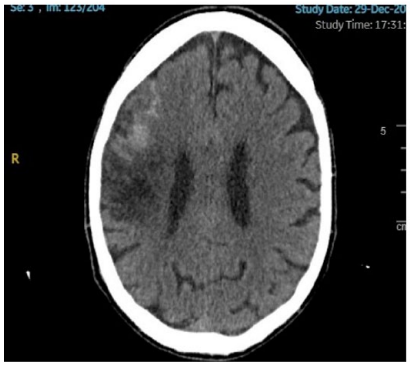
Background and aims: Cerebral hyperperfusion syndrome is a well-recognized and potentially fatal complication of carotid revascularization. However, the occurrence of non-aneurysmal subarachnoid hemorrhage as a manifestation of cerebral hyperperfusion syndrome post-carotid endarterectomy is uncommon. Clinical signs are throbbing, unilateral headache with nausea or vomiting, fits, and neurological deficits.
Methods: A 75- years old gentleman presented with colonic tonic seizure for 4 minutes which was followed by twitching on his left hand. He had a right carotid endarterectomy which was done since 5 days due to right hemisphere stroke with right ICA 90% proximal stenosis. His power in the Left upper limb was 2/5, zero hand grip strength, left hand twitches and reduced sensation in left upper limb. He had an urgent CT head which showed Gyriform hyperdensities in the right frontal region, anterior to his chronic infarct, suggestive of acute SAH. Neurosurgeon advised not for any intervention but to hold anticoagulants. He had a CTA for aortic arch, carotids and intracranial which showed Post Right ICA endarterectomy changes, Occluded left ICA, Right side SAH remains stable, no signs of any AV malformation or aneurysm seen.
Results: This case showed a rare condition of Hyperperfusion syndrome which is a complication of CEA. It can be associated with ICH, but isolated subarachnoid hemorrhage is extremely rare.
Conclusions: CHS is a potentially life-threatening complication of CEA and carotid stenting. It can happen within a few days postoperatively, but

can be delayed for weeks. Early diagnosis and management are important for good outcomes.

Images:





Disclosure of interest: No

503

Covid induced cerebral vasculitis in stroke

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Background and aims: It has been more than 3 years since the COVID-19 pandemic started. Covid -19 manifestations and severity differ from one person to another, it could be asymptomatic, simple upper respiratory tract infection to CNS including stroke.
Vasculitis is known to cause inflammation and necrosis of the blood vessel wall. Major symptoms of cerebral vasculitis are stroke, headache and encephalopathy; other symptoms include seizures, cranial nerve palsies or myelopathies.
In this case repot, we are presenting a patient with unusual Covid-19 related complication that is "Bilateral ischemic stroke secondary to COVID related cerebral vasculitis".
Methods: We present a case of a 62 -year- old female who presented with confusion and bilateral lower limb weakness.
Two weeks prior to admission, she presented shortness of breath, hypoxia, sepsis and confusion. CT chest showed thrombus in the left lower lobe segmental pulmonary artery. CT head showed no acute intracranial pathology. The patient was self- discharged before completion of investigations and started on anti-coagulation.
The patient was re- admitted with severe confusion and bilateral lower limb weakness. COVID infection confirmed by PCR test. MRI head and CT cerebral angiogram completed with cerebral vasculitis diagnosis.
Results: In cerebral vasculitis, steroid therapy showed significant clinical improvement.
Conclusions: In case of COVID related stroke, cerebral vasculitis should be considered. High doses of parenteral steroids are effective in treatment of COVID induced vasculitis.
Disclosure of interest: No

749

Multifocal ischaemic stroke in a young female with thrombotic thrombocytopenic purpura. A case report

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Background and aims: Thrombotic thrombocytopenic purpura (TTP) is characterised by pathological thrombi from a lack of von Willebrand factor (vWF) cleaving proteinase known as ADAMTS-13. vWF protein multimers and platelets aggregate within microvasculature causing thrombocytopenia and red cell fragmentation. Causes can be congenital or acquired following ADAMTS-13 autoantibodies. TTP is associated with various neurological presentations including stroke, seizure and coma.
Methods: A 43-year-old female presented with collapse and right sided limb paraesthesia and weakness. CT head revealed left frontal infarction and high dose Aspirin was commenced. MRI brain demonstrated multifocal infarctions in the left cerebral hemisphere and a solitary brainstem infarct.
Results: Blood tests revealed significant thrombocytopenia of 53 x10*9/L with normal haemoglobin and reticulocyte count and Aspirin was cautiously continued. Within 24 hours, bruising had appeared on her trunk and limbs and platelets had declined further to 46 x10*9/L. An urgent haematology consult was sought and Aspirin discontinued.
Blood film revealed 3% schistocytes confirming microangiopathic haemolytic anaemia (MAHA). She was rapidly transferred to the local TTP specialist centre and treated with four cycles of plasma exchange, high-dose Prednisolone, Rituximab and Caplacizumab. TTP was subsequently confirmed with an ADAMTS-13 level of 6% (<10% being significant). Antiphospholipid antibodies and vasculitis screen were negative. ADAMTS-13 level 4 months later was >104% with stable platelets.
Conclusions: This case highlights TTP as a rare cause of stroke in which anti-thrombotic treatment must be carefully balanced with bleeding risk and treating the underlying TTP the most important step in preventing further strokes or thrombotic events.
Disclosure of interest: No

778

Takotsubo cardiomyopathy associated with iatrogenic subarachnoid hemorrhage during mechanical thrombectomy for acute ischemic stroke

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Background and aims: Takotsubo cardiomyopathy (TCM) is a transient left ventricular apical ballooning that is associated with neurologic diseases such as subarachnoid hemorrhage (SAH), epilepsy, ischemic stroke, intracranial bleeds, migraine. The aim is to raise awareness of TCM as a rare complication among patients with ischemic stroke who undergo mechanical thrombectomy and develop iatrogenic SAH.
Methods: An elderly patient, presented with complete left MCA syndrome and NIHSS score was 22. CT Brain revealed early ischemic changes in left MCA territory (ASPECTS 8) and occlusion of left intracranial ICA and poor collaterals. Intravenous alteplase was started followed by EVT; successful reperfusion was achieved. Thereafter, contrast extravasation near terminal ICA, suggestive of arterial perforation and SAH was noted. Clinically, patient improved (NIHSS 6). Post procedure, ECG demonstrated marked ST-T wave abnormalities in inferior and anterolateral leads. TTE revealed moderate to severe reduction in LVEF (30-35%) with pattern of wall motion abnormalities consistent with Takotsubo cardiomyopathy

Results: ACE inhibitor and Beta blocker were started along with Dual antiplatelets and Statin. TTE, repeated after 3 days, showed improvement in LVEF (45-50%) and wall motion abnormalities.
Conclusions: This case is among first to demonstrate an association between an iatrogenic SAH during mechanical thrombectomy for acute ischemic stroke and TCM. With increasing number of neurointerventional procedures performed, rare effects of procedural complications on heart may be increasingly encountered and should be kept in mind.

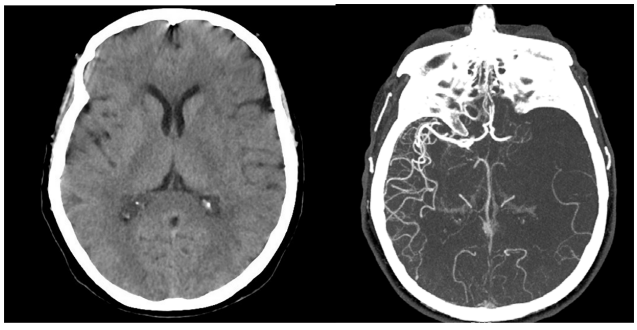

Figure1.

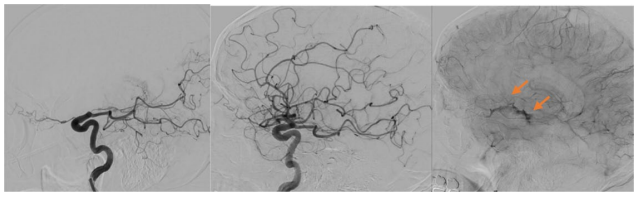

Figure2. Contrast stasis representing arterial perforation (arrows).

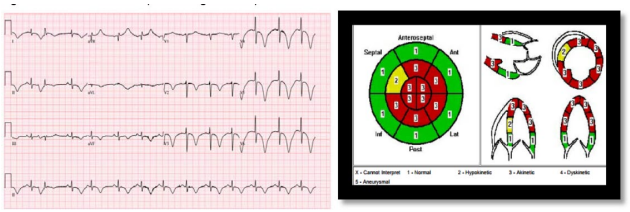

Figure3. ST-T wave abnormalities in inferior and anterolateral leads; Right: ECHO after three days.

Disclosure of interest: No

811

EAGLE'S SYNDROME AS A CAUSE OF STROKE AND ITS TREATMENT IN THE ACUTE PHASE: A CASE REPORT

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Background and aims: Eagle's syndrome is characterized by styloid process elongation or stylohyoid ligament ossification, most frequently causing neck pain or dysphagia, although it can rarely be the cause of syncope or stroke.
Methods: We report a case of a patient presenting with a middle cerebral artery (MCA) stroke secondary to carotid artery damage caused by Eagle's syndrome.
Results: A 66-year-old male presented to the emergency department with neurological symptoms. Neurologic exam revealed a right side hemiparesia, ipsilateral hypoesthesia and global aphasia, scoring twenty-six at the NIHSS score. CT brain perfusion showed an increase in the time-to-maximum with decreased cerebral blood flow in the entire territory of the left MCA, with a favorable mismatch. CT angiography evidenced an occlusion in the M1 segment of left MCA. It also showed findings consistent with a partially thrombosed pseudoaneurysm in the middle third of the left internal carotid artery (ICA), due to calcified distal end of the stylohyoid ligament congruent with Eagle's syndrome. Treatment was performed with mechanical thrombectomy and setting of a flow diverter stent in the left ICA. Dual antiplatelet therapy (DAPT) was started with clopidogrel and lysine acetylsalicylate. The patient showed clinical improvement, presenting a NIHSS score of four after the procedure.
Conclusions: Eagle's syndrome should be considered in the differential diagnosis of carotid disease. To date, there are few studies on the correct approach of these patients in the acute phase. Our study shows a favorable clinical outcome following the use of a flow diverter stent and DAPT.
Disclosure of interest: No

829

SUDDEN COMA ONSET FOLLOWING SIMULTANEOUS BILATERAL OCCLUSION TREATED WITH MECHANICAL THROMBECTOMY

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Background and aims: Bilateral intracranial artery occlusion is a rare stroke presentation with a variety of clinical manifestations, including sudden coma onset.
Methods: We report the case of a man with acute occlusion of the left internal carotid artery (ICA)-M1 segment of the ipsilateral middle cerebral artery (MCA) and occlusion of the M1 segment of the right MCA, presenting with sudden coma.
Results: A 79-year-old man with prior history of hypertension, hyperlipidemia and atrial fibrillation on anticoagulant treatment presented to the emergency department with abrupt onset coma. Neurological examination revealed GCS 7/15(E4V2M1), miotic pupils and bilateral Babinski reflex. Multiparametric cerebral CT showed occlusion of the left ICA-M1 left MCA (ASPECTS 6), and occlusion in the M1 right MCA (ASPECTS 9), both with ischemic penumbra. Intravenous fibrinolysis was contraindicated (INR:2) and the patient underwent bilateral mechanical thrombectomy (TICI:3) after 5 hours from symptoms onset. Neurological exam performed after the procedure revealed decreased consciousness and anisocoric non-reactive pupils. A 24-hours control CT scan showed diffuse subarachnoid hemorrhage and intraparenchymal hematoma in the left basal ganglia, extending to the brainstem and open to the ventricles with a mass effect and signs of subfalcial herniation, transtentorial and incipient tonsillar herniation. On neurological examination after 24 hours of evolution, the patient was in encephalic death, passing the next day.

Conclusions: Bilateral thrombectomy in bilateral occlusion of intracerebral arteries, even when successfully treated, can have a fatal outcome, possibly due to insufficient compensatory mechanisms during ischemia. Early diagnosis and treatment may improve functional outcomes.
Disclosure of interest: No

834

Basilar artery reocclusion within 24 hours after mechanical thrombectomy successfully treated with new intervention

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Background and aims: Acute basilar artery occlusion (BAO) may cause ischemia in the region of brainstem, parts of the thalamus, occipital lobes, and cerebellum, resulting in severe disability or mortality rate above 70%. Recurrent BAO has been described in only a small number of cases. The aim is to show feasibility and beneficial effect of rethrombectomy on the treatment of patients with BAO.
Methods: This is a case report of the patient who was admitted at our Emergency Department in November 2021.
Results: Previously healthy 37-year-old male presented with occipital headache, nausea, vomiting, right-sided hemiparesis, within 30 minutes from onset and NIHSS of 18. The patient was vaccinated against Covid-19 with Pfizer – BioNTech vaccine seven days before onset. On initial CT scan pc-ASPECT score was 10 and CT angiography (CTA) showed tip of BA thrombosis. Intravenous thrombolytic therapy was administered, followed by MT, achieving mTICI 3 and NIHSS of 5 after procedure. Within 24 hours from first MT, there was neurological deterioration followed by coma. Urgent CT/CTA was made and rethrombosis of BA was confirmed with pc-ASPECT score 10. MT was repeated with mTICI 2b. Stroke etiology was undetermined. After seventeen days, the patient was discharged and referred to continue rehabilitation treatment. After 90 days of stroke his NIHSS was 2 and mRS 1.
Conclusions: We can consider that early reccurent BAO can be successfully treated with repeated MT.
Disclosure of interest: No

932

SPONTANEOUS SIMULTANEOUS BILATERAL BASAL GANGLIA AND PONTINE HEMORRHAGE - A CASE REPORT

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Background and aims: Spontaneous simultaneous bilateral basal ganglia hemorrhage (SSBBGH) is exceedingly rare with few published case reports and high mortality. Hypertension is the main etiology in older patients. Metabolic, infectious and vascular etiology should be considered in younger patients besides trauma. We present a rare case of SSBBGH along with pontine hemorrhage, the etiology of which was likely hypertension.
Methods: A 72-year-old Asian lady was brought in after a fall. Her relevant past medical history included Type 2 Diabetes and no intake of anti-coagulants.
On examination she had right sided weakness with National Institutes of Health Stroke Scale score of 4 and Glasgow Coma Scale of 14. Her blood pressure was 172/80 mmHg. CT head (figure 1.1, 1.2) showed multiple focal hemorrhages.
Results: She was admitted to the hyper acute stroke unit (HASU) for further management. In neuroradiology multidisciplinary team meeting these hemorrhages were deemed to be of hypertensive etiology. MRI brain (figure 2) excluded the possibility of Cerebral Amyloid Angiopathy. She improved whilst in the unit.
Conclusions: In most intracranial hemorrhage (ICH) cases, bleeding is solitary and unilateral. SSBBGH is a rare subtype of ICH associated with poor outcomes. As per a systematic review of 60 reported cases, SSBBGH is more common in Asians with the commonest etiology being hypertension. Management is mainly conservative. Stroke specialists should be aware of this entity and its other potential etiologies to prompt appropriate investigations.

Figure 1.1 Central pontine bleed.

Figure 1.2 Bilateral Basal Ganglia bleed.

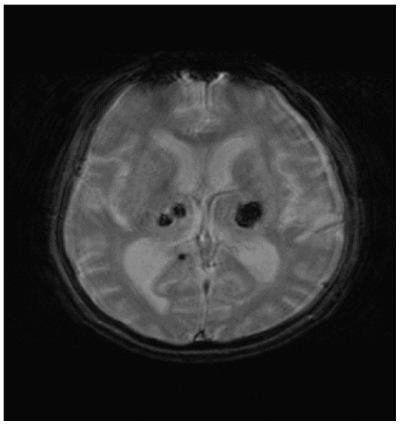

Figure 2. Bilateral Basal Ganglia Bleed.

Disclosure of interest: No

968

DEMYELINATING CENTRAL NERVOUS SYSTEM DISORDERS AS STROKE MIMICS: A CASE REPORT

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[1]Vilnius University, Faculty of Medicine, Institute of Clinical Medicine, Vilnius, Lithuania, [2]Republican Vilnius University Hospital, Department of Neurology, Vilnius, Lithuania

Background and aims: Although rare in the young, hyperacute onset focal neurologic deficits are mostly caused by stroke across all age groups. Other etiologies of the aforementioned pattern, including demyelinating central nervous system disorders, are rare. Our aim is to review a case of demyelinating lesions mimicking stroke symptoms.
Methods: To describe a case of demyelinating nervous system disorder mimicking acute stroke.
Results: A previously healthy 21 years old male with a history of recent synthetic cathinone use presented with aphasia and clumsiness of the right hand within an hour of symptom onset. Initial head CT and CTA were unremarkable. The initial diagnosis of acute ischemic stroke was done and intravenous thrombolysis with alteplase was administered. After treatment the neurological deterioration was noted, while 24 h non-contrast CT did not show any signs of stroke. Follow-up brain MRI revealed contrast enhancing periventricular lesion >3 cm in diameter with restricted diffusion and no mass effect in left frontoparietal lobe along with multiple demyelinating lesions in the right temporal lobe. Lumbar puncture revealed mild elevation of protein with normal cells and intrathecal IgG synthesis with oligoclonal bands. Diagnosis of demyelinating central nervous system disorder was made, and high dose steroid pulse therapy initiated.
Conclusions: Demyelinating central nervous system disorders should be considered as potential causes of hyperacute neurologic deficits in the young. MRI as screening modality might be useful in young patients with focal symptoms and without clear risk factors of stroke. Acute demyelination secondary to substance abuse cannot be excluded.
Disclosure of interest: No

1010

A 52-YEAR-OLD MAN WITH HEAD/NECK PAIN AND PERIPHERAL FACIAL NERVE PALSY

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[1]Medical University Innsbruck, Neurology, Innsbruck, Austria, [2]VASCage, Research Centre on Vascular Ageing and Stroke, Innsbruck, Austria

Background and aims: Peripheral facial nerve palsy is a common finding. It is critical to be aware of potential red flags for advanced diagnostics.
Methods: A 52-year-old man woke up with left sided head/neck pain, followed by left sided facial weakness. Neurologic examination showed a left sided peripheral facial nerve palsy and miosis. Within the following days, he developed palatal palsy on the left and a tongue deviation to the left. Magnetic resonance imaging: no ischaemic brain lesion, T1-fat-saturated hyperintensity along the left internal carotid artery (ICA) up to the cavernous part causing vessel occlusion, corroborating spontaneous cervical artery dissection (sCeAD).
Results: In general lower cranial nerve palsies in sCeAD stem from local compression syndromes from the dilated dissected ICA (as in our case IX and XII). As in our case VII shows no proximity to the sCeAD other pathogenetic mechanisms have to be taken into account, like ischemia of the VII vasa nervorum. The collateralization of the occluded ICA over the external carotid and ophtalmic arteries might have led to a steal phenomenon with hypoperfusion of superficial petrosal and stylomastoid arteries. An alternative explanation is an aberrant origin of the meningeal artery from the ICA occlusion site.
Conclusions: VIIth palsy in sCeAD is rare. Horner's syndrome and specific head/neck pain were evident in six of the seven former published cases. As this can easily be overlooked in VIIth palsy, specific head/neck pain patient history can assist clinicians in establishing the diagnosis and imply advanced cerebrovascular imaging.
Disclosure of interest: No

1014

Infectious carotiditis treated with mechanical thrombectomy as an unusual cause of ischemic stroke

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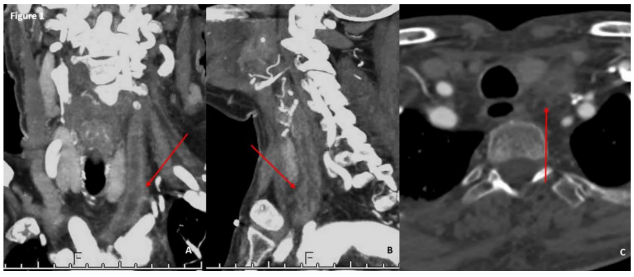
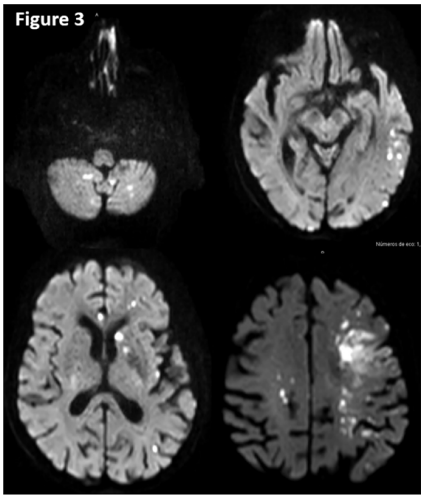
[1]Ramón y Cajal Hospital, Neurology, Madrid, Spain, [2]Ramón y Cajal Hospital, Radiology, Madrid, Spain

Background and aims: Ischemic stroke (IS) represents the most frequent neurological complication of infective endocarditis (IE). Carotiditis is an inflammatory and infectious involvement of the common carotid artery (CCA), being an infrequent manifestation of IE. Current guidelines are lacking in this specific scenario.
Methods: Case report.
Results: A 79-year-old woman was admitted in the hospital after complaining of three-day clinical symptoms of fever. Her medical history was significant for atrial fibrillation and biological aortic valve implantation two months earlier. Blood cultures were positive for *Staphylococcus epidermidis* and she was diagnosed with IE according to modified Duke criteria. On the second day of hospitalisation, she suffered a left-hemispheric IS (NIHSS score: 20). Initial CT angiogram of head and neck reported left CCA occlusion, besides extensive trabeculation of locoregional fat and inflammation of left supraclavicular musculature, all of them consistent with carotiditis (*Figure 1*).
Combined mechanical thrombectomy technique was performed with successful recanalization of left CCA (*Figure 2*). However, she showed absence of neurological improvement 24 hours later, with left CCA reocclusion confirmed by duplex. Brain MRI revealed bilateral multi-territorial acute-subacute infarcts (*Figure 3*), and transesophageal echocardiogram showed vegetations on the prosthetic aortic valve. Due to progressive decline of her neurological and systemic condition, she was not considered a candidate for surgical treatment. She died on the 7th follow-up day due to heart failure.
Conclusions: Endovascular treatment of the intraluminal thrombus was safe and complete recanalization of the vessel was achieved. Close attention to carotiditis is recommended due to its fatal outcome.





Disclosure of interest: No

1209

INDIRECT CAROTID-CAVERNOUS FISTULA – ALTERNATIVES TO ENDOVASCULAR TREATMET

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Background and aims: Carotid-cavernous fistulas (CCF) are abnormal connections between arterial flow and venous drainage through the cavernous sinus (CS). They can be direct or indirect.
Their presence causes venous congestion with risk of blindness and intracranial bleeding.
Endovascular treatment (ET) is considered first-line in high-risk patients, however, it is not always possible.
Methods: Case description and literature review
Results: A 76-year-old female with history of hypertension, obesity and schizophrenia, presented with three-week history of right periorbital edema, eye redness and diplopia.
At observation, right CS syndrome was diagnosed. Visual acuity (VA) in the right eye was 0.2; intraocular pressure (IOP) was 37mmHg. Left eye VA was 0.4 and IOP 28mmHg. Remaining neurological examination was normal.
Brain imaging suggested right indirect-CCF and subsequent digital subtraction angiography (DSA) confirmed right D(2) Barrow indirect-CCF supplied by the internal and external carotid arteries bilaterally. ET was tried unsuccessfully and the patient was treated conservatively with bilateral carotid compressions (CC).
To avoid blindness due to high IOP a cyclophotocoagulation was performed with improvement. Four weeks after starting CC, complete CCF exclusion was observed on DSA. There was frank improvement of proptosis and eye movements; visual acuity was stable and IOP was normal.
Conclusions: Although ET is considered first-line treatment for high-risk indirect-CCF, when technically challenging, CC can be the only therapeutic option.
They should be considered after discussion since, as this case shows, they can lead to CCF closure.
Bridge therapy with cyclophotocoagulation may help delay ophthalmic complications and lead to better clinical outcomes.
Disclosure of interest: No

1380

A peculiar pediatric stroke: clinic and etiology

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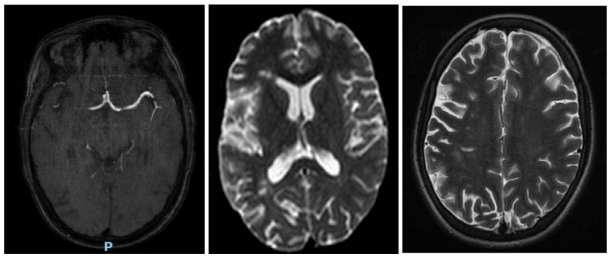
Background and aims: We present the case of a stroke of unusual presentation and etiology in a 15-year-old adolescent with juvenile idiopathic arthritis.
Methods: The patient went to the emergency department because of involuntary movements of the left arm and peribuccal, continuous, not suppressible, at rest and with movements.
Cranial MRI: acute/subacute ischemic infarction in the right middle cerebral artery territory secondary to occlusion of the M1 segment, bilateral supratentorial white matter lesions without diffusion restriction, suggestive of chronic vascular etiology.
Echocardiogram: mitral valve mass.
Surgery was performed with excision of a mass suggestive of myxoma, but culture of the sample was performed, being positive for Bifidobacterium longum.
After IV antibiotic treatment for endocarditis and adiro 50 mg/24h, she was fine with complete recovery.
1 month later she presented transient motor aphasia. A cranial MRI was performed in which we could apreciated a subacute stroke in the M2 territory of the left middle cerebral artery.
A thrombophilia study was performed: triple positivity for antiphospholipid antibodies (lupus anticoagulant, anti cardiolipin and anti B2 GPI).
Results: Diagnosis: 2 strokes from different territories with choreiform symptoms and aphasia as clinical manifestations. Endocarditis. Antiphospholipid syndrome.
Treatment: adiro 100mg/24h and acenocoumarol.
Conclusions: It was our aim to emphasize the importance of taking into account the clinical variability with which a stroke can present in childhood, and of carrying out an in-depth etiological study regarding possible structural causes, as well as autoimmune causes.



Disclosure of interest: No

1434

Seizures revealing NICE lesions: an uncommon stroke mimic following intracranial aneurysm embolization

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Background and aims: NICE lesions are uncommon complications of endovascular treatment, likely related to foreign body emboli, mostly asymptomatic, commonly benign, although persistent long-term enhancement is frequent. Here an unusual presentation of this pathology.
Methods: A 55-year old woman was treated with a Pipeline Vantage flow diversion stent for an aneurysmal regrowth of a previously embolized left pericallosal aneurysm. Patient was discharged asymptomatic under double antiplatelet therapy. One month after, she was admitted to the emergency department for dysarthria, aphasia and right hemiparesis. Initial NIHSS was 11.

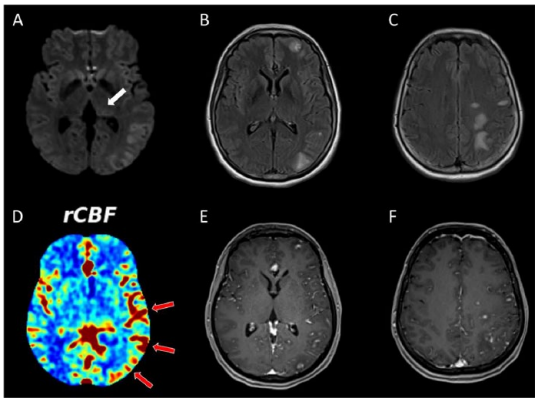

Figure 1 Baseline imaging
Baseline imaging [MRI (A:DWI, B-C:FLAIR, E-F:T1 with Gadolinium) and CT-perfusion (D)] revealed cortical DWI-lesions, a slight pulvinar sign (A), and hyperperfusion on CT-CBF maps (D), suggesting seizures-related anomalies, associated with multiple NICE lesions : FLAIR-hyperintense (B-C) and Gadolinium-enhanced (E-F).

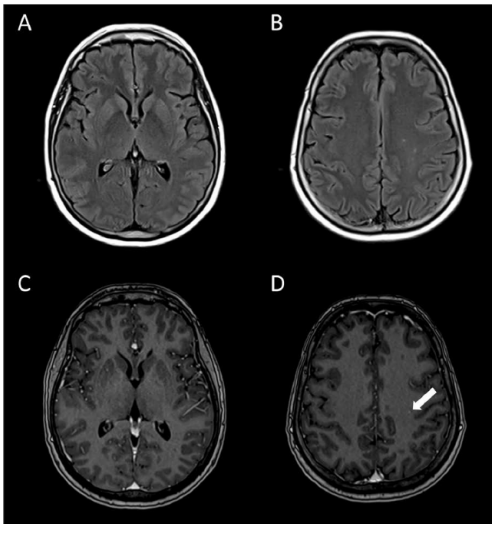

Figure 2. Follow-up imaging.
Follow-up MRI (A-B:FLAIR, C-D: T1 with Gadolinium) revealed a near normalization of the imaging, with only very small persistent lesions, of which one was enhanced (arrow).

Results: Cerebral imaging (**Figure 1**) showed multiple enhanced lesions, predominantly in the left middle cerebral artery territory and watershed areas, associated with ictal abnormalities. Patient was treated with antiepileptics, allowing rapid improvement. Diagnosis of non-ischemic cerebral enhancing (NICE) lesions was made after negative comprehensive results. After 4 months under steroids treatment, patient was asymptomatic, with only one persistent punctiform enhancement on MRI (**Figure 2**). Aneurysm exclusion was complete.
Conclusions: This case details a rare case of stroke mimic due to post-endovascular treatment NICE lesions.
Disclosure of interest: No

1556

A CASE OF PULMONARY ARTERIOVENOUS MALFORMATION (PAVM) WITH HEREDITARY HAEMORRHAGIC TELANGIECTASIA (HHT) - A RARELY ENCOUNTERED CAUSE OF PARADOXICAL EMBOLIC STROKE

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Background and aims: PAVMs can be responsible for paradoxical embolic strokes caused by the right-to-left shunt created due to the abnormal connection between the pulmonary veins and arteries.
Here we describe a 45year lady who after detailed clinical and radiological assessment was found to have PAVM and HHT, being the reason for her stroke and successfully treated with transcatheter embolization with no further recurrence.
Methods: MRI brain revealed a left thalamic infraction when she presented with right hemiparesis and hemisensory loss. Routine investigations (Carotid imaging, 7day ECG, Young stroke bloods) and observations failed to explain the cause of stroke. A Bubble echocardiogram was requested to look for paradoxical causes.
Results: ECHO demonstrated dense bubbles appearing in the left atrium and ventricle via the left upper pulmonary vein suggestive of PAVM. Contrast CT thorax was instrumental in diagnosing and localizing the PAVMs.
It transpired she had multiple telangiectasia and nose bleeds since childhood and so did her children, and that she met all 4 criteria of Curacao for HHT.
Conclusions: Patients with visceral arteriovenous malformation are at higher risk of haemorrhagic complications following thrombolysis and can pose a dilemma in acute stroke management as a large proportion are unaware of their diagnosis. Adding screening questions pre-thrombolysis like "Do you, or does anyone in the family, have nose bleeds?" may help in diagnosing and making informed choice of treatment.
An antiplatelet agent is safe and so is anticoagulation as long as visceral arteriovenous malformations have been excluded else caution is advised.
Disclosure of interest: No

1560

Atypical PRESentation

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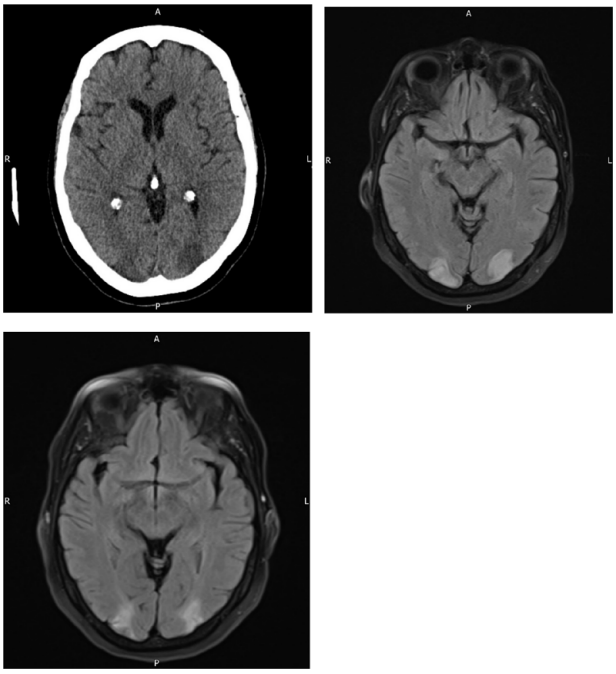
Background and aims: Posterior reversible encephalopathy syndrome (PRES) presents with rapid onset of neurological symptoms and usually resolves within a week upon timely diagnosis and management. Magnetic resonance imaging (MRI) changes resolve over days to weeks.
We present a case of PRES following sepsis and a high dose of corticosteroids.

Methods: 65-year-old hypertensive, diabetic lady with history of Crohn's disease was treated for severe atypical pneumonia and acute flare of Crohn's disease with intravenous antibiotics and high-dose hydrocortisone in the intensive care unit. Her blood pressure fluctuated, and she had resistant severe hypertension prior to discharge.
She was re-admitted the next day with headache, blurry vision, dysphasia, and unsteadiness. Examination was normal aside from subtle visual field defect. Computed tomography (CT) scan showed bilateral low-attenuation changes in the occipital lobes- presumably stroke. Consequent MRI showed restricted diffusion involving both occipital lobes and tiny foci adjacent to the posterior horn of left lateral ventricle. We diagnosed PRES and treated her with clopidogrel and antihypertensives.
Six weeks later, she has almost completely recovered. However, repeat MRI showed incomplete resolution of those lesions.
Results: Conclusions: CT findings are negative in almost all PRES cases and when positive, it is difficult to distinguish from acute stroke. The modality of choice is the diffusion-weighted MRI. The most common finding is (commonly bilateral) oedema in the white matter of occipitoparietal area. The syndrome can involve or extend beyond the posterior cerebrum and patients may develop permanent cerebral injury and be left with residual neurological defects.



Disclosure of interest: No

1600

Cerebral vasculopathy associated with Graves' disease

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Background and aims: A moyamoya-like vasculopathy is a cause of ischaemic stroke in patients with Graves' disease. The exact mechanism of this vasculopathy is uncertain. We report a case in which magnetic resonance vessel wall imaging (MR-VWI) strongly suggested arteritis, prompting immunosuppressive treatment.
Methods: A previously well 20 year old woman of Vietnamese ancestry presented with right-sided sensory loss and weakness, preceded by headache, neck pain and vomiting, and longer-standing tremor and insomnia. Imaging showed infarction in the territories of the left middle and posterior cerebral arteries. There was severe narrowing in the extra- and intracranial segments of both internal carotid arteries, the proximal right

anterior and middle cerebral arteries, and the left posterior cerebral artery, without collateralisation (*Figure 1*). Blood tests confirmed autoimmune hyperthyroidism.

Results: Despite treatment with aspirin, propranolol and carbimazole, her stroke symptoms worsened over days, prompting reinvestigation. Although inflammatory markers, autoimmune, infective and thrombophilia screens, CSF examination, PET and systemic vascular imaging were normal, contrast-enhanced MR-VWI showed circumferential thickening and enhancement of the walls of the narrowed arteries (*Figure 2*), consistent with a medium-to-large vessel vasculitis. Intravenous methylprednisolone was administered, then oral prednisolone.

Conclusions: Based on these findings, a vasculitis affecting medium and large intracranial and cervical arteries may contribute to stroke and vasculopathy associated with Graves' disease. The workup of cranio-cervical vasculopathy should include thyroid function and autoantibody testing, especially in young females. Early immunosuppression should be considered in similar patients. The role of MR-VWI in predicting progression and treatment response merits further investigation.

Figure 1. Left: severe diffuse stenosis of left ICA. Right: volume-rendered MRA showing absent left ICA flow and multiple intracranial stenoses including right M1 and M2, and left P1, P2 and PComm segments

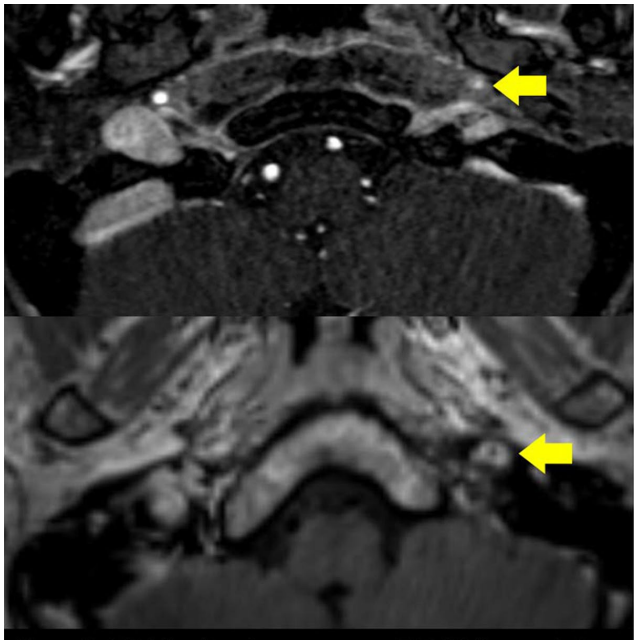

Figure 2. MRA (top) and post-contrast T1 MRI (bottom) show narrowing of the left ICA with a thickened and enhancing wall

Disclosure of interest: No

1622

GOT BLOOD IN A BLACK HOLE: A CASE OF POST-TRAUMATIC INTRACRANIAL HEMORRHAGE WITHIN A GIANT TUMEFACTIVE PERIVASCULAR SPACE

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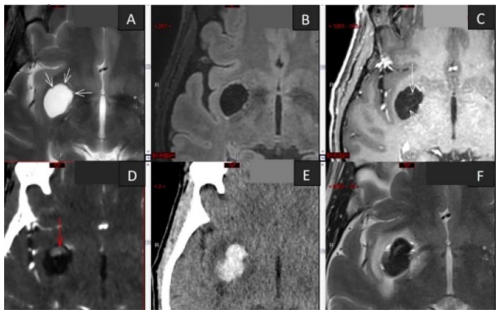
Background and aims: Brain perivascular spaces (PVSs) are pial-lined, interstitial fluid-filled structures that accompany penetrating arteries. When enlarged, they often appear as clusters of variably sized cysts. Giant tumefactive PVSs (GTPVS) may cause mass effect but are usually asymptomatic. To our knowledge, only one case of bleeding within GTPVS is reported in the literature. We aim to report a case of traumatic intracranial hemorrhage within a GTPVS.

Methods: We describe a patient with an already known GTPVS who bled into it after a moderate traumatic brain injury.

Results: A 57-year-old Caucasian man was found on the ground, alert, with a wound on his left eyebrow. He had taken tolperison due to chronic low back pain and drank Vodka, and reported an amnesia for the event. The neurological exam was normal. Non-contrast-enhanced CT scan showed a recent right-sided hemorrhage in the anterior portion of a roundish cavity (Figure 1D), which increased to fill the entire hypodensity on the 24-hour control CT scan (Figure 1E). MRI performed 3 weeks earlier due to non-pulsatile tinnitus had already shown a hypointense, non-hemorrhagic, CSF-filled cavity, compatible with a GTPVS (Figure 1A-C). The 72-hour 3T MRI confirmed the diagnosis (Figure 1F). Our literature search revealed one previous similar case of a 42-year-old women with an asymptomatic traumatic hemorrhage within a GTPVS (Galli et al, Cureus, 2021;13).

Conclusions: We present second case report of a traumatic bleeding within a GTPVS. Although usually asymptomatic, GTPVS may represent, under certain circumstances, a locus minoris resistentiae more susceptible to hemorrhage.



Disclosure of interest: No

1628

Hemiballism as monosymptomatic manifestation of Moyamoya syndrome

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Background and aims: Moyamoya syndrome is a cerebrovascular condition characterized by progressive narrowing of large arteries, principally involving anterior circulation territories. Ischemic stroke is the main clinical manifestation. Post-stroke movement disorders are rare and are predominantly associated with lacunar infarctions.
Methods: We present a case of a young patient with Moyamoya syndrome presenting solely with acute hemiballism.
Results: A 38-year-old man without any prior medical history presented with sudden right retro-orbital intense pain and involuntary movements of his left limbs, consistent with left hemiballism. Neurological examination was otherwise unremarkable.
Brain MRI showed ischemic lesions involving the right posterior internal capsule and mesencephalon. Cerebral angiography revealed narrowing of the right internal carotid, posterior communicating artery and segment P2 of the posterior cerebral artery. It was also significant for stenosis of right lenticulostriate arteries with puff of smoke pattern in segment M1 of the right middle cerebral artery, suggesting Moyamoya syndrome. The remaining investigation of stroke in young patients was unremarkable. The patient was medicated with haloperidol 1mg 2id with clinical improvement. He was started on acetylsalicylic acid 150mg id and atorvastatin 40mg id and the case was referred to Neurosurgery.
Conclusions: Hemiballism as the first and only manifestation of Moyamoya syndrome is rare, with most cases occurring in children. Although uncommon, sudden onset hemiballism must raise suspicion for Moyamoya syndrome, especially in young patients.
Disclosure of interest: No

1734

PSEUDOBULBAR SYMPTOMS DUE TO STROKE OF BILATERAL CORONA RADIATA: A RARE CASE OF FOIX-CHAVANY-MARIE SYNDROME

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Background and aims: A 55-year-old man came to Stroke Unit for dysphagia and anarthria. He was affected by diabetes type I and suffered for a previous stroke in left corona radiata. Mild right spastic motor hemisyndrome remained. Symptoms became 48 hours before; thus, he was not eligible for revascularization treatment.
Methods: The patient was anarthric, with lingual and laryngopharyngeal-palatine hyposthenia. He had an expressionless face with pseudo-peripheral bilateral facial palsy and severe dysphagia. The glycated haemoglobin was 80 mmol/mol (normal values 20-40 mmol/mol). Considering the typical risk factors of small vessel disease and the symptoms, we assumed that the location of the stroke could be the brainstem.
Results: Brain MRI showed, in DWI sequences, acute ischemic lesion in right corona radiata. No past or recent ischemic strokes were evident in brainstem. The site of the lesion, in view of the previous stroke, depicted a possible double lesion of the cortico-bulbar pathway. This condition, which can lead to a clinical condition indistinguishable from bulbar involvement, is called Foix–Chavany–Marie syndrome (FCMS). FCMS syndrome is a rare cortical type of pseudobulbar palsy characterized by automatic–voluntary dissociation of motor function of cranial nerves V, VII, IX, X and XII. It may be caused by bilateral infarction or damage of frontal-opercular regions.
Conclusions: Although rare, FCMS must be taken into account. Particularly, in the case of patients with a history of previous stroke and pseudobulbar symptoms, it is important to diagnose it early, in order to set up the appropriate neurorehabilitation procedure.
Disclosure of interest: No

1793

RARE CASE OF PERSISTENT PROATLANTAL ARTERY ASSOCIATED WITH MOYAMOYA DISEASE IN A PATIENT WITH ACUTE ISCHEMIC INFARCT

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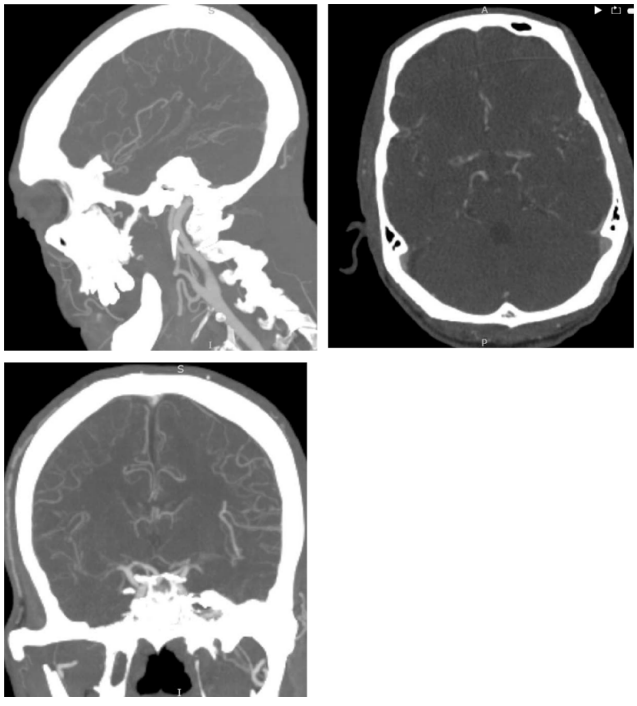
Background and aims: Carotid-vertebral and carotid-basilar anastomoses are present around 4-5 weeks of embryogenesis. Their persistence post birth, commonly termed as persistent proatlantal artery (proA) is uncommon and oftentimes incidental. We report a unique case of persistent carotid-vertebral artery with associated Moyamoya disease in a patient with acute ischemic infarct. To our knowledge, this is the only reported case of its kind with Moyamoya disease and persistent proA in the same patient.
Methods: Case report and review of literature
Results: 68-year-old male was admitted to the ICU after a ground level fall and non-contrast CT of the head revealing mild traumatic sub arachnoid hemorrhage (TSAH). During admission, he developed a new onset left upper and lower extremity weakness. MRI revealed an acute ischemic infarct involving the right middle cerebral artery (MCA) distribution. CT angiogram revealed a persistent left type 1 pro atlantal artery as well as showing stenosis of bilateral supraclinoid internal carotid artery (ICA) and MCA's with prominent lenticulostriate markings consistent with Moyamoya disease. The patient was discharged on dual anti-platelet therapy for secondary stroke prevention with conventional 4-vessel cerebral angiogram planned in a few weeks.
Conclusions: Persistent proA are uncommon with very few case reports mentioned in literature. Based on our search, this is the first reported case of concurrent Moyamoya disease and persistent left proAtlantal artery in the same patient.



Disclosure of interest: No

1841

BILATERAL CENTRAL RETINAL ARTERY OCCLUSION IN GIANT CELL ARTERITIS

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Background and aims: Central retinal artery occlusion (CRAO) is a rare form of acute ischemic stroke that often leads to severe visual loss or blindness. We present a case report of bilateral CRAO as the primary manifestation of giant cell arteritis (Horton Disease).
Methods: A 67-year-old woman sought medical attention for a day of sudden vision loss in her right eye. Her ophthalmologic examination revealed the diagnosis of right CRAO. Two days later, she lost vision in her left eye too with the diagnosis of left CRAO. CTA examination was performed without pathological findings. The patient was administered of intravenous alteplase. Visual acuity before treatment was limited to light and motion left and 0.5/50 right.
Results: With the history of untreated recurrent headache, and the presence of clinical and laboratory findings (high inflammatory markers, scalp tenderness, temporal artery tactile thickening), the diagnosis of Horton disease was highly suspicious. After treatment with immunosupressive therapy, a significant improvement in visual acuity was achieved.
Conclusions: Arteritic CRAO occurs usually secondary to giant cell arteritis. This condition is more likely to arise in patients over 70 years of age and accounts for approximately 4% of all CRAO cases. Our patient was initially treated with intravenous thrombolysis as an acute ischemic stroke. No complications of treatment were noted. It is often not possible to determine the cause at the beginning of the difficulties, and we consider the intravenous application of thrombolysis to be an indicated and safe treatment.
Disclosure of interest: No

1876

MIDDLE CEREBRAL ARTERY VARIANT OCCLUSION WITH MINOR SYMPTOMS

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[1]Turku University Hospital, Neurocenter, Turku, Finland, [2]Turku University Hospital, Department of Radiology, Turku, Finland

Background and aims: The middle cerebral artery (MCA) is often involved in strokes and is the most common target for thrombectomy. In an estimated 0.2 to 3.9 % of cases two MCA-like arteries arise from the internal carotid artery (ICA) or the anterior cerebral artery (ACA).[1] In the cases of embolic stroke involving a duplicate or accessory MCA the embolus usually lodges itself in the larger and straighter of the two vessels.[2]
Methods: This case report describes a 43-year-old male who presented 5 hours from symptom onset with fluctuating dysarthria and facial paresis and was found to have an occlusion of a duplicate MCA (*figure 1*).
Results: Because of late presentation and the patient being relatively asymptomatic (NIHSS score of 0 at presentation) no intervention was performed. A relatively small infarct approximately 2.5 cm in diameter developed (*figure 2*). During follow-up minor neuropsychiatric symptoms and a modified Rankin score of 1 at 3 months were noted.
Conclusions: Careful evaluation of the vascular territory-at-risk is crucial when an anatomic variant artery is present and thrombectomy is considered.

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2. Shapiro M et al. Neuroanatomy of the middle cerebral artery: implications for thrombectomy. *J NeuroInterventional Surg*. 2020;12(8):768-773.

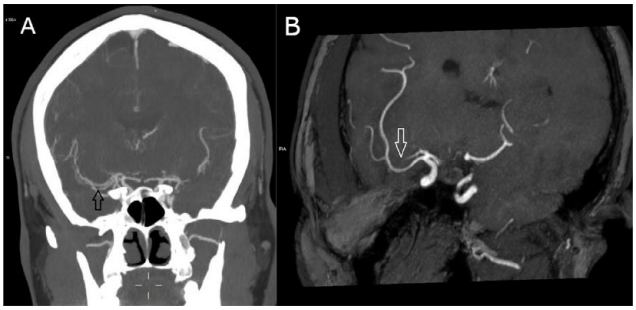

Figure 1. Duplicate MCA on the right with occlusion of the non-dominant MCA (A, B).

Figure 2. The next day's CT demonstrates an acute frontal infarct on the right.

Disclosure of interest: No

2056

A Case of Varicella Zoster Virus CNS Vasculitis and Ischemic Stroke

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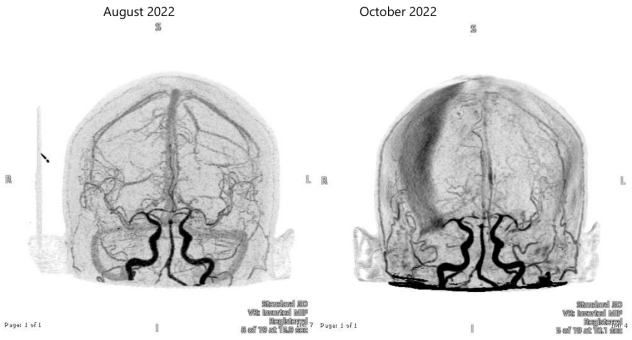
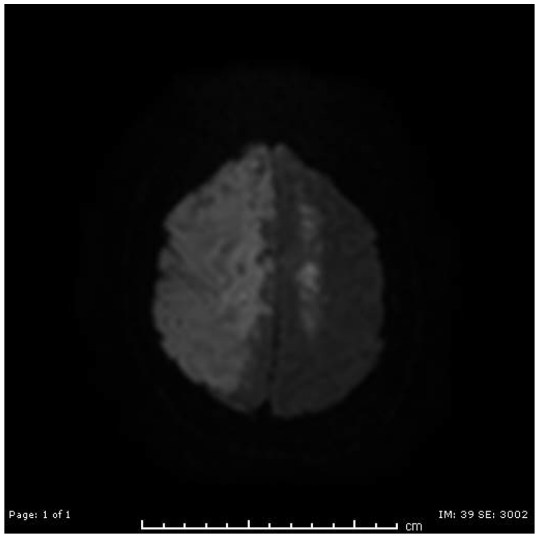
Background and aims: Varicella Zoster (VZV) cerebral vasculitis is unique and under recognized. Careful diagnostic investigation is warranted so that appropriate therapy can be initiated.
Methods: We report a case of a 59-year old female, who presented in August 2022 with transient vertigo and ataxia thought to be TIA. She represented in October 2022 with right hemiparesis, hemianesthesia, and aphasia.
Results: Brain MRI revealed left anterior frontal lobe, corona radiata, centrum semiovale infarct. CTA revealed nearly occluded A2 segment, severe right M1 and multifocal stenosis involving multiple branches of the anterior and posterior cerebral arteries. Findings were progressive compared to CTA in August. MRA vessel wall imaging showed extensive luminal irregularity of the proximal anterior and posterior circulation with concentric vessel wall thickening and enhancement. Serum ESR and hsCRP were normal. Lumbar puncture revealed 52/mm3 nucleated cells with lymphocytic predominance, protein of 151mg/dl, normal glucose. CSF VZV IgG antibodies was positive although PCR for VZV was negative. Since work up was concerning for vasculitis, patient received IV methylprednisolone. Brain biopsy revealed lymphoplasmacytic inflammation and focal, lymphocytic

vessel wall infiltration, but negative for vascular necrosis and granuloma. After lymphoma and CNS infection were ruled out, induction with cyclophosphamide was initiated. Unfortunately, patient suffered several additional large vessel occlusion infarcts, herniated, and did not survive.
Conclusions: VZV CNS vasculitis has a protean manifestation. Detection of VZV-IgG antibody in the CSF is highly diagnostic. The muitifocal nature of VZV vasculopathy makes biopsy a test with low sensitivity.



Final MRI



Disclosure of interest: No

2129

UNUSUAL HEMORRHAGIC BRAIN METASTASIS MIMICKING CEREBRAL MICROBLEEDS

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Background and aims: Many conditions could be considered as differential diagnoses for small round signal loss on T2-weighted gradient echo (GRE) MRI. If there is no history of cancer or contrast-enhanced MRI, it is difficult to differentiate hemorrhagic metastasis with cerebral microbleeds. We describe a patient with atypical hemorrhagic brain metastasis mimicking microbleeds.
Methods:
Results: A 65-year-old man with hypertension and diabetes presented with dysarthria and gait disturbance. He had a 50 pack-year smoking history. Although the T1 and T2-weighted brain MRI revealed no evidence of abnormality, GRE revealed multiple, hypo-intense lesions in the cortical and subcortical areas. Because of multiple stroke risk factors, asymptomatic cerebral microbleeds were highly suspected. However there were no microbleeds on MRI which was performed eight months earlier for the purpose of evaluating tremor. Therefore, newly developed multiple microbleeds raised a suspicion of hemorrhagic metastasis. Contrast-enhanced MRI revealed multiple, enhanced, nodular lesions. Chest CT revealed a tumor on the right lower lung with metastatic lymph nodes. Lung biopsy demonstrated poorly-differentiated adenocarcinoma. Follow-up MRI showed prominent multifocal enhancing nodules suggestive of progression of metastasis.
Conclusions: T2-weignted GRE can detect much smaller hemorrhagic metastases than smallest tumor that can be detected on contrast-enhanced MRI. Because there are relatively restricted number of kinds of primary cancers that cause hemorrhagic metastases, GRE can also help to identify the primary cancer. Therefore, it is necessary to perform brain MRI scans to include various sequences including GRE in order to diagnose small hemorrhagic metastasis which may be undetected on T1-enhanced images.
Disclosure of interest: No

2130

UNUSUAL PATTERN OF SUBARACHNOID HEMORRHAGE IN A PATIENT WITH INFECTIVE ENDOCARDITIS

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[1]Emergency University Hospital Bucharest, Neurology, Bucharest, Romania,
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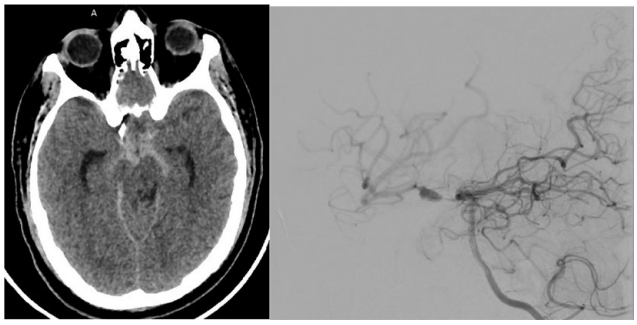
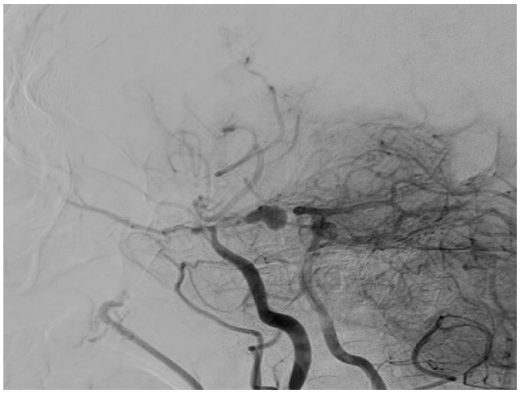
Background and aims: Infective endocarditis (IE)-related subarachnoid hemorrhage (SAH) is generally regarded as the result of small and distal mycotic aneurysm rupture. We present the case of a ruptured posterior communicating artery (PCom) aneurysm in the context of IE.
Methods: A 39-year old man presented to another hospital for thunderclap headache, fever and vomiting. Emergent CT scan revealed an 8/5 mm right PCom aneurysm, with perimesencephalic SAH and occlusion of the right internal carotid artery (ICA) above the ophthalmic segment. Echocardiography demonstrated aortic and mitral valve vegetations with severe regurgitations. Blood cultures were positive for viridans group streptococcus. Cerebral MRI additionally revealed several small ischemic lesions and scattered microbleeds. Targeted antibiotic therapy was initiated and the patient was transferred to our hospital for further treatment.
Results: Cerebral angiography revealed an enlarged 10/15 mm right PCom aneurysm fed via the posterior circulation, while the right ICA remained occluded above its ophthalmic segment. Right anterior circulation was maintained via the anterior communicating artery. Endovascular treatment was performed by using a double vascular access via the left vertebral artery and the right ICA (after passing through the occlusion) for coiling, without peri-procedural complications. Subsequently, mechanical valve replacement was performed. Post-operative course was uneventful.
Conclusions: Presence of a proximal, ruptured intracranial aneurysm with occlusion of the distal ICA in the context of IE may suggest septic arteritis leading to enlargement of a probably previous PCom aneurysm, in our patient. Antibiotic therapy, endovascular aneurysm treatment and surgical valve replacement concurred to provide an excellent outcome.





Disclosure of interest: No

2165

ISCHAEMIC STROKES DUE TO RELAPSING THROMBOTIC THROMBOCYTOPENIC PURPURA (TTP) WITH NORMAL PLATELET COUNT: TWO CASE REPORTS

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Background and aims: The exact aetiology of TTP is unknown. TTP typically presents as thrombocytopenia and severe Microangiopathic Haemolytic anaemia. Initial presentation as ischaemic stroke is uncommon. Median platelet count for TTP according to Oklahoma TTP-HUS registry is 10,000/microL. Most cases of TTP are associated with severe deficiency of ADAMTS 13 activity due to autoantibodies against this protease.
Methods: We report two cases of known TTP in remission presenting as Ischaemic strokes with normal platelet count
Results: Two cases are females aged fifty eight and thirty seven. Both were known cases of TTP under remission. They presented with Ischaemic stroke. Bilirubin, Haemoglobin and platelet count were normal in both the patients. They had mildly elevated LDH and Troponin I levels. ADAMTS 13 level were found to be low in both cases. One patient had scanty schitocytes on blood film and elevated reticulocyte count but other did not. MRI showed infarcts of embolic pattern. Plasma exchange, Rituximab and steroids were the mainstays of treatment. Both patients made a good recovery.
Conclusions: TTP can present atypically as Ischaemic strokes with normal platelet count. TTP should be considered as one of the causes of cryptogenic strokes even when platelet counts are normal. ADAMTS13 level is the mainstay of diagnosis. Prompt diagnosis and treatment of TTP is necessary as mortality rate is as high as 90% without treatment.
Disclosure of interest: No

2224

SENSIBILITY AND SPECIFICITY OF VESSEL WALL MAGNETIC RESONANCE IMAGING (VW-MRI) IN THE DIAGNOSIS OF VASCULITIS: A CASE SERIES AND REVIEW OF THE LITERATURE

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Background and aims: We report a case series whose diagnosis of central nervous system vasculitis (CNS) was suspected based on VW-MRI. We illustrate through these cases the interest and the limit of technique.
Methods: All patients presented abruptly with focal neurological deficits and the brain MRI demonstrated a stroke. They underwent VW-MRI, acquired on a 3 Tesla Magneton Vida scanner (Siemens Healthineers, Erlangen, Germany), performed using a fat- and blood-suppressed 2D double inversion recovery spin-echo T1-weighted sequence pre- and post-contrast. All patients underwent lumbar punction with CSF analysis, digital subtraction angiography (DSA), PET scan, infective and autoimmune serologies. One patient had a leptomeningeal biopsy.
Results: In one patient, VW-MRI showed eccentric enhancement at the level of the stenotic area of the proximal portion of the middle cerebral artery (MCA) associated with a diffuse atherosclerotic pattern (supra-aortic trunks, coronary arteries, lower limb arteries) suggesting atherosclerotic origin. The second patient showed symmetrical concentric enhancement of the stenotic area of the proximal portion of the MCA and the complete workup performed concluded to an HSV-vasculitis. The last patient had concentric diffuse enhancement more marked in the periphery, whose workup affirmed the diagnosis of small vessel vasculitis.
Conclusions: VW-MRI can identify CNS vasculitis from atherosclerotic lesions. Recent studies suggest that the concentric VW enhancement can identify patients affected by medium-sized vessels CNS vasculitis with a specificity of 95% and sensitivity of 94%, but careful analysis of the MRI feature is essential and must be correlated with the clinic context to assess the diagnosis.
Disclosure of interest: No

2237

PROBABLE CEREBRAL AMYLOID ANGIOPATHY (CAA) PRESENTING WITH CONVEXITY AND PERIMESENCEPHALIC SUBARACHNOID HEMORRHAGE

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Background and aims: Cerebral amyloid angiopathy (CAA) is known to be associated with lobar hemorrhages as well as convexity subarachnoid hemorrhage (cSAH). Perimesencephalic subarachnoid hemorrhage (pSAH), on the other hand, is not generally associated with CAA
Methods: We report the case of a 57-year-old female with history of hyperlipidemia, alcohol and marijuana use who presented with a thunderclap headache. Initial imaging showed SAH in the L parieto-occipital convexity as well as perimesencephalic cisterns and increased perivascular spaces. Screening for causes of RCVS and vasculitis was unremarkable except for use of marijuana.

Results: The patient had two diagnostic angiograms a week apart with no angiographic evidence of vasculitis or vasospasm. Lab workup for vasculitis was unremarkable and a lumbar puncture indicated elevated red blood cells and normal adjusted protein secondary to SAH. MRA vessel wall imaging of the head indicated no enhancing vessels suggestive of vasculitis or vasospasm or vascular abnormalities in the area of hemorrhage. MRI brain obtained post-discharge indicated a right frontal microbleed, SWI hypointensity in posterior L parietal lobe (same area as prior SAH) and subarachnoid siderosis in superior cerebellum. Based on the Boston criteria 2.0, the patient met the criteria for probable CAA as patient is over 50 years of age with MRI findings of cSAH, evidence of superficial siderosis, cerebral microbleeds as well as an increase in centrum semiovale perivascular spaces.
Conclusions: In patients meeting criteria for probable CAA based on the Boston 2.0 guidelines, convexity SAH can also be accompanied by perimesencephalic SAH.
Disclosure of interest: No

2257

CHEIRO-ORAL SYNDROME PRESENTING AFTER TACROLIMUS-INDUCED HYPERTENSION, STARTED DURING RENAL TRANSPLANT

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Background and aims: Cheiro-oral syndrome is a rare condition characterized by sensory disturbances in the peri-oral area and upper extremity, usually in the hand or fingertips. It is commonly caused by a stroke in the contralateral thalamus.
Methods: We report the case of a 64-year-old man with history of well controlled hypertension, myocardial infarction and recent kidney transplant on tacrolimus and mycophenolate who presented with numbness of the right upper lip and right fingertips. Neuroimaging indicated a solitary left thalamic infarct with no other FLAIR changes associated with small vessel disease.
Results: Further stroke workup included MRA head/neck which indicated findings of intracranial atherosclerotic disease, echocardiogram indicating normal ejection fraction with mild left atrial enlargement, ultrasound of the carotids indicating 50-69% stenosis on the right carotid and less than 50% stenosis on the left. Hemoglobin a1c was 7.2 and LDL was 48. Given the timing of the stroke after starting immunosuppressive medication, the relative lack of other risk factors, the small vessel ischemic changes noted on MRI brain and recent episodes of presyncope preceding the event with possible orthostatic hypertension, it is hypothesized that the tacrolimus was responsible for elevating the blood pressure in otherwise well controlled hypertension, leading to the stroke.
Conclusions: Tacrolimus can cause elevated blood pressure/hypertension and is a risk factor for cardiovascular disease and stroke. In recent renal transplant patients, immunosuppresants should be considered as possible cause for stroke.
Disclosure of interest: No

2265

Binasal quadrantanopia: a clinical myth?

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Background and aims: Binasal quadrantanopia is a rare type of visual field defect characteristic of vision loss in either the upper or lower medial quadrant in both eyes. The lesions are prone to localize in the pre-chiasmal pathway or the optic chiasm, and various etiologies have been reported. Herein, we presented a case of binasal quadrantanopia with ischemic origin.
Methods:
Results: A 71-year-old man with the underlying disease of hyperlipidemia, and chronic kidney disease stage 3 presented with an acute onset of painless right eye blurred vision with a stationary course for 2 weeks. Fundoscopy revealed swollen right optic disc without hemorrhage and the cup-to-disc ratio of the right eye was 0.2. Optical Coherence Tomography revealed right optic disc edema and thinning left retinal nerve fiber layer at superior and nasal quadrants. Humphrey visual field showed a right nasal-lower quadrantal to altitudinal defect and a left nasal-lower quadrantal defect. Brain MRI revealed no specific findings. Bilateral anterior ischemic optic neuropathy was diagnosed. The patient was treated with aspirin and atorvastatin. After treatment, the patient's neurologic signs and symptoms remained stationary.
Conclusions: Binasal quadrantanopia is rarely encountered in clinical practice, which can occur with ocular or cerebral causes, evaluation and diagnosis strategies are rather challenging. Due to the difficulty of lesion localization, medical history, eye, and brain examination results, laboratory data, and relevant clinical manifestations should all be taken into consideration to confirm the etiology. Prompt diagnosis and treatment may avoid irreversible consequences and influence the visual outcome.

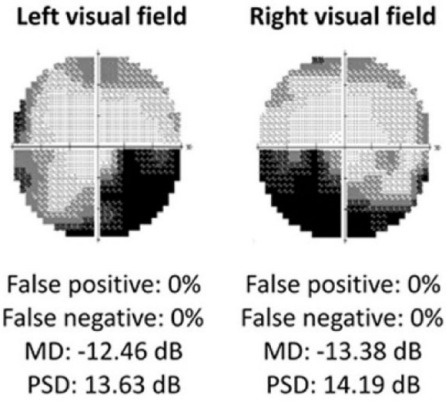

Figure 1. Humphrey visual fields (30-2) showed binasal inferior quadrantal visual field defects.

92x80mm (120 x 120 DPI)

Disclosure of interest: No

2312

SOONER OR LATER, STROKE COMES TO HAPPEN WHEN COCAINE IS ON STAGE

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Background and aims: Cocaine abuse has increased over the years. This drug intake is related to a wide range of vascular and coagulation dysfunctions, what increase the risk of both ischemic and hemorrhagic stroke.
We present a case of ischemic stroke of undetermined source due to different coexisting etiologies in a patient with systemic vasculopathy associated to cocaine abuse.

Methods: 70-year-old man with vascular risk factors, autoimmune polyglandular syndrome, and chronic cocaine abuse, presented to the emergency department with a new onset of deterioration of level of consciousness and gait imbalance. The examination was remarkable for drowsiness, right facial drop, dysarthria, and gait ataxia.
Results: Brain MRI revealed multi-territory acute ischaemic strokes and hemorrhagic transformation such as cortical border zone between left MCA and PCA and right PICA territories. Transthoracic echocardiogram and cardiac MRI showed severe deterioration of left ventricular function and the presence of an apical thrombus. Cerebral angiography was performed visualizing stenoses of multiple medium-sized brain arteries.
The differential diagnosis included multiple etiologies: atherosclerosis, cocaine-associated cerebral vasculitis, reversible cerebral vasoconstriction syndrome and cardiac embolism. Eventually, after the multidisciplinary team's discussion, a decision was made to start the patient on anticoagulation with favorable clinical evolution.
Conclusions: Cocaine is a substance widely used recreationally and the prevalence of its complications is increasing. Cocaine abuse is related to different ischemic stroke and systemic vascular dysfunction mechanisms. Therefore, it is challenging to discover the actual etiology of cocaine-associated ischemic stroke to decide the optimal treatment.

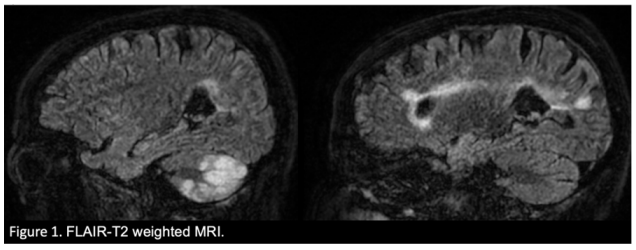
Figure 1. FLAIR-T2 weighted MRI.


Figure 2. Cerebral arteriography.

Disclosure of interest: No

2352

SULCAL ARTERY SYNDROME, AN UNCOMMON VARIANT OF SPINAL CORD INFARCTION, IN A PATIENT WITH PERSISTENT TRIGEMINAL ARTERY. CASE REPORT

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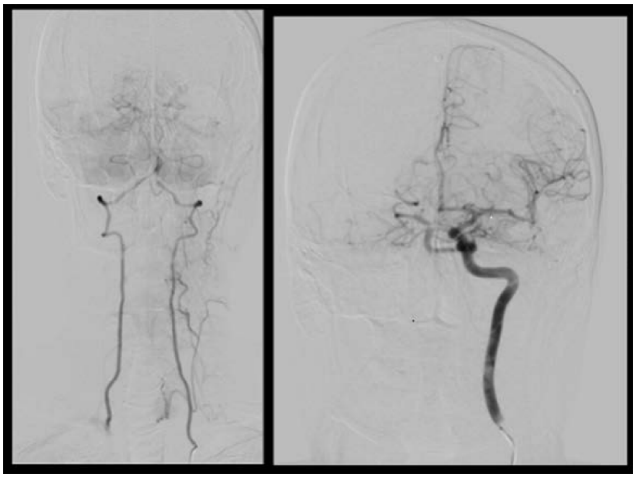
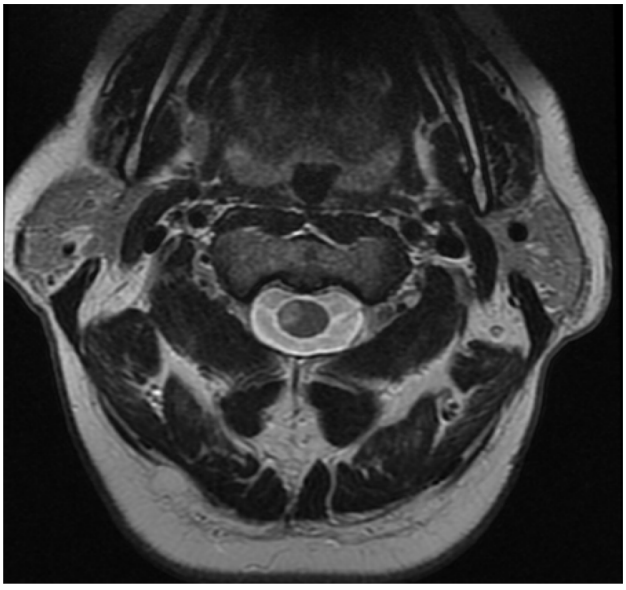
Background and aims: Sulcal artery syndrome (SAS) is an uncommon variant of spinal cord infarction involving the anterior two-thirds of spinal hemicord, territory of a sulcal artery. These are perforating branches of the anterior spinal artery, originated from vertebral arteries. Most published cases have been associated with vertebral artery dissection but other etiologies may be involved. This is the first reported case related to a persistent trigeminal artery (PTA).
Methods: We describe a case of SAS associated with PTA.
Results: A 56-year-old male, with hypertension, suffers suddenly weakness in right extremities. Examination revealed mild right hemiparesis, left-sided hypoalgesia from neck downward and a right Horner´ syndrome, sparing vibrational and proprioceptive senses bilaterally, consistent with an incomplete Brown-Séquard syndrome in cervical segment. Differential diagnosis was considered between inflammatory or ischemic cause. AngioCT reports PTA type I Saltzman with filiform vertebral arteries, confirmed by angiography(1). MRI(2) showed a short C2 segment T2 hyperintensity involving the anterolateral right hemicord. LCR and blood studies showed dyslipemia and hyperhomocysteinemia and ruled out autoimmune and infectious cause. These findings together with the abrupt onset guide to ischemic etiology. Additionally, some cases in the literature relate PTA with strokes in vertebrobasilar circulation. The clinical deficit and lesion in MRI diagnose SAS, probably caused by decreased vascular supply to anterior spinal artery jointly with vascular risk factors.
Conclusions: SAS must be considered as a possible diagnosis in incomplete Brown-Séquard syndrome.
The PTA may be an infrequent cause of stroke, cord infarction or insufficiency in vertebrobasilar circulation.


1. Angiography



2. MRI

Disclosure of interest: No

2359

Cerebral Aspergillosis as a Stroke-mimic in a patient with acute myeloid leukaemia

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Background and aims: Invasive aspergillosis (IA) is the result of systemic spread of Aspergillus and affects predominantly immunocompromised patients, up to 10% of patients undergoing allogenic stem cell transplantation (ASCT). Central nervous system (CNS) involvement occurs in 10-15% of cases with a wide variety of neurological clinical features and a mortality beyond 90% despite treatment.
Methods: We present a case of a immunocompromised man presenting with neurological symptoms due to IA associated stroke. Complementary tests and clinical evolution of the patient are reviewed.
Results: A 32-year-old man, on the +43rd day after his third ASCT due to an acute myeloid leukaemia, presented with sudden onset of neurological symptoms consisting of diplopia, dysarthria, facial paralysis and decreased consciousness level. Physical examination showed a chickenpox skin infection under acyclovir treatment. Urgent brain CT scan demonstrated multiple supra-and infratentorial brain infarcts, thyroid, and pulmonary lesions secondary to septic embolisms caused by IA, confirmed by brain MRI. Blood tests revealed severe pancytopenia and acute renal failure; transthoracic echocardiography ruled out infectious vegetation/ intracavitary thrombi. Empirical treatment for herpetic vasculitis with acyclovir and prednisone (1mg/kg/day) was added to the antifungal treatment (voriconazole and amphotericin B). Microbiological studies revealed the presence of positive galactomannan antigen. Despite targeted antifungal treatment the patient died 72h after the cerebrovascular event.
Conclusions: The present case highlights an important and life-threatening manifestation of IA with CNS involvement, reaching up to 50% of cases according to the literature review, and a rare stroke-mimic. Suspicion and early treatment is important to improve outcomes.
Disclosure of interest: No

2469

BASAL VEIN OF ROSENTHAL (BVR) THROMBOSIS : A DIAGNOSTIC CHALLENGE

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Background and aims: Cerebral venous thrombosis (CVT) accounts for only 0.5-1% of cases of acute stroke. Venous anatomy variations, occluded anatomy and robustness of collateral venous pathways often conspire to delay the diagnosis. Basal vein of Rosenthal (BVR), by virtue of its unique ontogeny, has a higher incidence of such variation in anatomy. Incidence of isolated BVR thrombosis is unknown and has only been elucidated in individual case reports. Through a series of three cases, we intend to capture the heterogeneity of its clinical presentation and imaging appearances.
Methods: Contrast enhanced MRI with MR venogram was the imaging modality. Imaging findings on MRI were reviewed with clinical details in all the three cases.
Results: A brief clinical summary of all the cases with unique territorial pattern of involvement is available in table 1. The distinctive territorial distribution of venous congestion and hemorrhage involved hippocampus, ventrolateral thalamus and lateral hemi-mesencephalic tegmentum in all the cases. Two of the three cases showed evidence of meningeal inflammation on CSF analysis. None of the patients had any history of substance abuse or OCP usage. Hypothesis for thrombosis of BVR and its rare occurrence has been discussed with importance to its anatomical variations and its association with meningeal inflammation.
Conclusions: The distinctive territorial distribution should prompt the diagnosis of BVR thrombosis. Its unique anatomy with a longitudinal anastomotic channel reiterates its clinico-radiological diverse presentation when thrombosed.

Table 1. Clinico-radiological summary of all the three cases.

Case	Age/Sex	Risk factors	Presentation	Treatment	Neuroparenchyma involved	Thrombus detection	Outcome
1	55y/F	Meningitis	Fever, headache, vomiting, altered sensorium	IV Antibiotics	Right thalamus, superior vermis, hippocampus, and the hemi-mesencephalon.	SWI and Post contrast	Death (mRS-6)
2	48y/M	Non-CNS infection. (Herpes dermatitis)	Single seizure episode.	Acyclovir	Left hippocampus, ventrolateral thalamus and lateral hemi-mesencephalic tegmentum	SWI and Post contrast	Good (mRS-0) No seizure recurrence
3	21y/F	Post-partum	Headache and hemiplegia	Anti-coagulants	Right ventrolateral thalamus, PLIC and hemi-mesencephalic tegmentum	CT, T1W, SWI and Post contrast	Mild disability (mRS-2)

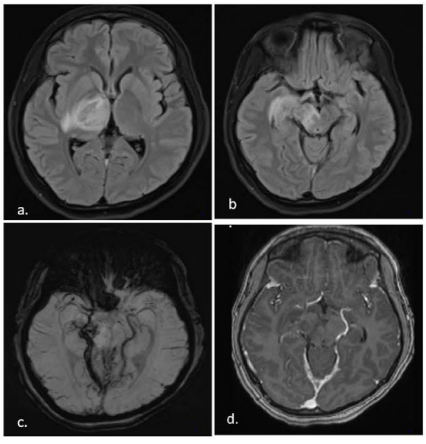

Figure 1. MRI Brain in a 21 year old post partum female patient with headache and hemiplegia:

a. and **b.** show FLAIR hyperintense signal in right posterior limb pf internal capsule, thalamus, right hippocampus and tegmentum.

c. shows extensive blooming along right BVR.

d. shows non opacification of right BVR.

Disclosure of interest: No

2495

GIANT CELL ARTERITIS PRESENTING AS RECURRENT ISCHEMIC STROKES IN THE VERTEBROBASILAR TERRITORY

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Background and aims: Cerebrovascular ischemic events have been reported in patients with giant cell arteritis (GCA) with predominant involvement of the vertebrobasilar territory. The variable clinic presentation makes the clinical suspicion of this entity difficult.
Methods: Report of a case of a Neurology patient in a tertiary hospital. Clinical records from a tertiary hospital were used.
Results: A 71-year-old man, with multiple known vascular risk factors, presenting with a sudden onset of nystagmus, dysarthria and ataxia. CT Angiography showed stenotic segments of the vertebral arteries and proximal occlusion of the right vertebral artery. Thrombectomy was unsuccessful. MRI revealed bilateral acute and non-acute cerebellar infarcts. The patient had no pain on palpation of temporal arteries, a Doppler ultrasound without evidence of hypoechogenic halo sign, and an unremarkable temporal artery biopsy. FDG-F18 PET scan was performed showing diffusely increased uptake in the vascular territories of the vertebral and temporal arteries, confirming the suspicion of vasculitis.
Based on these findings, combined with clinical presentation, glucocorticoids were promptly initiated. The patient eventually was started on immunosuppressants with good clinical recovery.
Conclusions: This case underlines the importance of clinical suspicion of underlying GCA in patients with recurrent ischemic events, particularly in the vertebrobasilar territory, even in patients with heavy risk factors. It also highlights the importance of PET scan in demonstrating active vascular inflammation. GCA with CNS involvement is a rare cause of stroke and a diagnostic challenge, where new imaging techniques play an essential role, guiding us to a prompt initiation of directed therapy.
Disclosure of interest: No

2508

A SHORT WAY TO DEVELOP PARAPLEGIA AND A LONG WAY TO IDENTIFY ITS CAUSE - 2 CASES OF SPINAL DURAL ARTERIOVENOUS FISTULA

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Background and aims: Although spinal dural arteriovenous fistula (SDAVF) is the most common arterio-venous malformation, it is an extremely rare pathology. SDAVF usually develops slowly progressive non-specific neurological symptoms, but 5-15% of the cases present acute exacerbations.
Methods: We report the cases of two men aged 43 years-old, respectively 58 years-old, who were admitted in different services, before presenting in our clinic with paraplegia of acute onset.
For determining the cause, we performed comprehensive neurological examination and lab tests, spinal magnetic resonance imaging (MRI) and digital subtraction angiography (DSA).
Results: Neurological examination of both patients revealed spastic paraplegia, sensory impairments, and urinary incontinence.
MRI depicted serpiginous epidural flow-voids with gadolinium enhancement, located predominantely posterior in the inferior cervical, thoracic and superior lumbar segments in the first patient. After two normal DSA, the third one catheterizing the right T6 intercostal artery, confirmed the presence of SDAVF with significant dilatation of the perimedullary venous plexus. In the second patient, MRI revealed the same aspect suggestive for the presece of SDAVF in the lower thoracic and superior lumbar segments, the DSA confirming the diagnosis.
Embolization with precipitating hydrophobic injectable liquid (PHIL 25%) was performed with complete obliteration of the fistula in both patients, with significant improvement of the deficits.
Conclusions: The diagnosis of SDAVF is easily overlooked and delayed, even when DSA is performed by an experienced neuroradiologist. Regardless of the onset and severity of neurological symptoms, the complete obliteration of the shunt may prevent irreversible neurological deficits and reduce the disability.
Disclosure of interest: No

2525

Ipsilesional Arm Levitation in a Patient with Right Fronto-Parietal Lobar Hemorrhage: A Case Report

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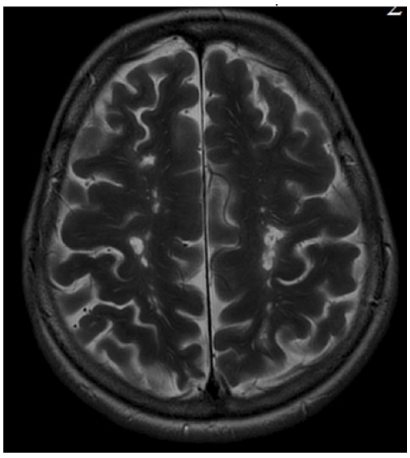
Background and aims: Alien-hand syndrome (AHS) is a rare phenomenon in which a patient's upper limb performs involuntary complex motor activities. Spontaneous arm levitation (SAL) is a part of the so-called posterior AHS, in which the non-dominant arm's movements are less complex than in the callosal and frontal subtypes, and usually purposeless. Lesions producing AHS and SAL have almost exclusively been reported contralesionally to the affected arm. We present an 87-year-old patient with a right fronto-parietal lobar hemorrhage presenting with ipsilesional SAL.
Methods: The data was obtained by examining the patient and reviewing his medical records. The discussion is based on available literature.
Results: Our patient's SAL presentation was unique in that it was ipsilateral to the lobar hemorrhage. What is more, the affected arm was dominant, which has not yet been reported and is in contrast with the usual descriptions of the posterior AHS subtype affecting the non-dominant limb.
Conclusions: The reported case of ipsilesional SAL is extremely rare. To our knowledge, it has only been reported in two previous articles, describing a total of four patients, all with a left-sided pathology. Similar cases, preferably with additional diagnostic tests, should be reported in the future.
Disclosure of interest: No

2526

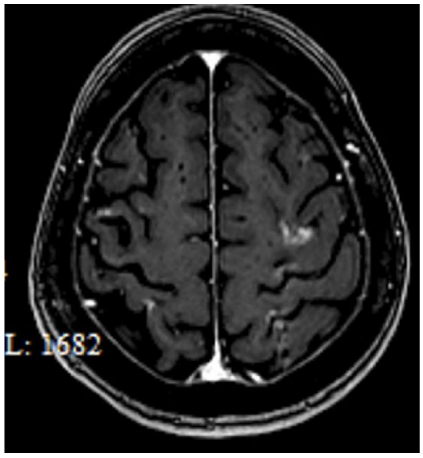
RECURRENT MULTIPLE WATERSHED CEREBRAL INFARCTIONS IN BILATERAL SYMMETRICAL BORDER ZONE AREAS IN A PATIENT WITH EOSINOPHILIC GRANULOMATOSIS AND POLYANGIITIS

Ludmila Anatskaia*[1], Dmitry Naumenko[2], Tatsiana Hvishch[1], Svetlana Kliunchyk[1], Larysa Yudzina[1]
[1]Republican Research and Clinical Center of Neurology and Neurosurgery, Department of Neurology, Minsk, Belarus, [2]Republican Research and Clinical Center of Neurology and Neurosurgery, Department of MRI, Minsk, Belarus

Background and aims: Watershed infarcts are traditionally attributed to ischemia caused by hypoperfusion due to large artery steno-occlusion, congestive heart failure, arterial hypotension. We present a case report of recurrent multiple watershed cerebral infarctions in bilateral symmetrical border zone areas in a patient with eosinophilic granulomatosis and polyangiitis (EGPA).
Methods: A previously healthy 55-year-old female after COVID-19 infection during the course of 8 months developed hypereosinophilia, asthma, sinusitis, multiple mononeuropathy of both peroneal and left ulnar nerves, mild cognitive impairment. Oral corticosteroid and antiplatelet therapy were applied. Despite potent treatment, a 3 months later, she developed ataxia and was admitted to our hospital. On admission mild pseudobulbar syndrome, bilateral pyramidal insufficiency, moderate static and dynamic ataxia, multiple mononeuropathy of both peroneal and left ulnar nerves, elevated values of eosinophils, and inflammatory markers (sedimentation rate and C-reactive protein) were found.
Results: Brain MRI revealed multiple infarcts in watershed areas in both hemispheres of the brain (figure 1).
Conclusions: In patients with a neuroimaging pattern of multiple watershed cerebral infarctions in bilateral symmetrical border zone areas, without large artery steno-occlusion in the presence of a marked increase in eosinophils' count EGPA should be considered in stroke etiological evaluation as rare cause of a stroke.



On contrast brain MRI a linear accumulation of gadolinium according to the hirus type in both hemispheres, in the watershed zones is determined (figure 2).



The EGPA activity was easily suppressed with methylprednisolone in combination with azathioprine. For a secondary stroke prevention rivaroxaban was prescribed.

Disclosure of interest: No

2530

All PFO are Right-Left Shunts, but not all Right-Left Shunts are PFO: A Case Study

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Background and aims: Patent foramen ovale (PFO) as a source of right-left shunting (RLS) is a recognized risk factor in young patients. Current standard of care for RLS diagnosis includes transthoracic echocardiography (TTE), and transesophageal echocardiography (TEE), which focus on intracardiac RLS. TCD can more accurately describe and quantify the embolization of other extra-cardiac RLS .
Methods: As part of the stroke workup at our center, a robotic autonomous AI assisted TCD (rTCD) bubble study was performed (NovaGuide, NovaSignal Corp to identify RLS, using Spencer Logarithmic Scale (SLS) for shunt grading. High grade shunts are referred to Cardiology for TEE evaluation.
Results: A 38 year-old male presented with acute hemianopsia (NIHSS of 1). Head CT demonstrated ischemic infarcts in right cerebellum and hippocampus regions. CTA showed distal PCA occlusion. The rTCD bubble study showed SLS Grade 5 RLS. TEE done to evaluate for PFO was positive for moderate bubbles. Upon attempted closure, no intracardiac defect was present. Given the magnitude of shunting revealed by rTCD, cardiac MRI and chest CTA confirmed presence of pulmonary AVM (PAVM) as embolic source, which was subsequently embolized.
Conclusions: This case represents a key example of an RLS causing cerebral embolization in the absence of PFO, and supporting the inclusion of TCD into the cryptogenic stroke workup. The severity of shunting demonstrated by TCD was critical in leading to more aggressive management and ultimate diagnosis and treatment of PAVM. Smaller PAVMs that can cause decompensated hypoxia and septic emboli are discussed .
Disclosure of interest: Yes

2540

Use of Transcranial Dopplers to Monitor Intracerebral Hemodynamics Post-Thrombectomy

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Background and aims: In patients presenting with acute ischemic stroke who undergo treatment with endovascular thrombectomy (EVT) it is uncommon to find delayed cerebral vasospasm as a consequence of post-EVT subarachnoid blood products. We present a case in which asymptomatic post-procedural subarachnoid blood was followed by delayed cerebral vasospasm.
Methods: Retrospective chart review
Results: The patient is a 65 year-old female presenting with left hemiparesis and neglect and was found to have right M1 occlusion. She received IV-tPA, and underwent EVT with TICI 1 reperfusion after nine passes. There were no intraoperative complications including vasospasm. Intraoperative CT revealed subarachnoid blood products throughout the right hemisphere; subsequent CTs confirmed this to be hemorrhage not contrast. Transcranial doppler (TCD) on day 1 post-op showed elevated velocities throughout the bilateral MCAs (right 130s-140s; left 180s-240s). There had been no change in the patient's exam and therefore no intervention to address the elevated velocities. TCD on day 4 post-op revealed an interval normalization of flow velocities in bilateral MCAs. The patient was cleared for discharge day 10 post-op to a rehabilitation facility.
Conclusions: A common untoward effect of EVT is presence of subarachnoid blood products post-procedurally. There currently exist no established guidelines for routine post-EVT imaging in clinically stable patients since it is theorized but not proven that post-EVT subarachnoid blood does not cause vasospasm. Here we describe a patient whose course did indeed lead to cerebral vasospasm. This case demonstrates a potential role of serial TCDs to recognize and monitor intracerebral hemodynamics post-EVT.
Disclosure of interest: No