Abstracts of

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P01F

CT perfusion changes without arterial occlusion in acute neurological deficits

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Background:
Perfusion CT (pCT) has become established in most stroke centres as a critical imaging tool in the evaluation of acute neurological deficits, supporting the diagnose of some stroke mimics as well. However, in the absence of arterial occlusion, the interpretation of pCT may be challenging.

Material and methods:
Retrospective, observational study analyzing patients admitted with acute neurological deficits (<24h) and changes in pCT with negative arterial occlusion in angioCT, in our tertiary hospital (2017-2018). Patients with carotid stenosis were excluded. Patients were classified depending on pCT findings as "hyperperfusion" or "hypoperfusion". Clinical characteristics and outcomes were analyzed.

Results:
59 patients with hypoperfusion and 12 with hyperperfusion were included, not showing significant differences in baseline demographics. In hyperperfusion group, 3 (25%) patients were diagnosed of stroke/TIA and 9 (75%) of seizures, without significant differences in baseline characteristics. All patients with stroke/TIA in this group had a 90 days 0-2. In hypoperfusion group, 47 (79.6%) patients had a stroke/TIA and 12 (20.4%) had an alternative final diagnose (including migraine). The former displayed a higher prevalence of high blood pressure and dyslipidemia. 16 patients (34%) within the stroke group received intravenous thrombolysis, without any secondary symptomatic bleeding. Among patients with stroke/TIA, 82.6% had a 90 days 0-2.

Conclusions:
In our experience, most patients with acute stroke/TIA without arterial occlusion and pCT changes had a good clinical outcomes at 90 days. Alteplase was safe in cases of hypoperfusion without vascular occlusion. pCT may be helpful differentiating stroke mimics (including seizures or migraine).
P02F

Carotid revascularization of critical occlusive carotid disease.

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Background:
Critical stenosis, subocclusion and local occlusion present almost terminal occlusion of internal carotid artery (ICA). Differential diagnosis could be achieved with assessment of upper artery segments. The aim of the study: to describe different types of critical carotid occlusive disease and assess results of surgical revascularization.

Methods:
During 2016-2018 years 323 patients underwent ultrasound and CT-angiography of brachiocephalic arteries prior to surgical treatment of ICA occlusive disease. We distinguished several types of ICA changes: stenosis more than 60% and 70%, critical stenosis, subocclusion, local occlusion.

Results:
From all patients ICA stenosis up to critical level was observed in 104 patients. Cases with critical narrowing of ICA at atherosclerotic lesion level and normal distal portion were described as critical stenosis – 84 patients (26% of all observed cases). Cases with critical narrowing at atherosclerotic plaque level and diffuse decrease of upper segments were detected as subocclusion – 18 cases (5.6% of cases). In 2 patients we observed local occlusion of ICA in the bulb with distal circulation through atypical ascending pharyngeal artery. No cases with congenital ICA hypoplasia were detected. In patients with diffuse decrease of upper ICA segments all elements of the circle of Wills were detected in 70% of cases. All patients underwent surgical reconstruction of affected artery. In 270 cases eversion carotid endarterectomy was held, in 19 cases – conventional endarterectomy. In 28 patients internal carotid artery grafting was performed, in 6 cases – common carotid grafting with eversion carotid endarterectomy. After surgical treatment neurological complications were observed in 1%.

Conclusion:
We can refer critical stenosis, subocclusion and local occlusion to critical atherosclerotic ICA changes. CT-angiography is necessary for preoperative assessment of carotid occlusive disease, especially in critical ICA changes. Carotid revascularization showed good results even in cases of critical occlusive carotid disease.
P03F

Dual antiplatelet therapy in high risk patients with TIA or minor stroke

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BACKGROUND:
Recent literature has shown that early dual antiplatelet therapy can safely reduce recurrence in high-risk patients with transient ischemic attack (TIA) or minor stroke. We present an observational study.

MATERIAL AND METHODS:
Prospective registry of ischemic stroke attended at our Stroke Unit from January 2017 to June 2019. We selected patients with high risk TIA (ABCD≥4), or minor stroke (NIHSS≤ 5) treated with dual antiplatelet therapy (aspirin + Clopidogrel for 3 weeks) within 24 hours after onset. We analysed baseline clinical characteristics, recurrence and safety at 3 months.

RESULTS:
We included 2550 patients with TIA or ischemic stroke. Ninety-four patients fulfilled inclusion criteria (71.2% males) with a mean age 71.2 (SD 12.1), 74.5% had hypertension, 29.8% DM type 2, 58.5% dyslipidemia and 32.0% were smokers. Thirty-six patients were previously taking antiplatelet agents (primary prevention in 8 and secondary prevention in 28). Thirty-six (38.3%) had high-risk TIA with median ABCD2 5 (range 4·7) and 58 (61.7%) minor stroke with median NIHSS 2 (range 1·5). At 3 months follow up 4 patients had recurrent stroke (4.3%). There were 3 minor bleeding events (4.4%) which did not require blood transfusion (2 haematurias and 1 local bleeding in the context of hip fracture). In 2 patients dual antiplatelet therapy was discontinued due to detection of atrial fibrillation. There was one death during follow-up not related to treatment (pneumonia).

CONCLUSION:
In this cohort dual antiplatelet therapy with aspirin and clopidogrel seems safe and effective for patients suffering high risk TIAs or minor stroke.
Introduction: stroke and myocardial infarction are among the main causes of death and disability in the adult population, because even in the case of timely provision of qualified medical care, those patients may have incomplete restoration of functions lost in the acute period of the disease. We are introduce case report of a patient who simultaneously developed ischemic stroke and ST-elevation myocardial infarction.

Report: 55-year-old man was presented in our hospital with significant retrosternal pain and severe neurological deficit. The onset of symptoms was 3 hours prior to admission. The patient was a smoker, his past medical history include periodic increase blood pressure to 160/90 mm.hg. He periodically took ACE (Enalapril). The ECG reveal 2 mm ST elevation in inferior leads, troponin test was negative. Neurologic evaluation revealed facial asymmetry, dysarthria and left-sided weakness (NIHSS 10). Prompt non-contrast head CT scan was suspicious for MCA occlusion. Patient received Ticagrelor 180 mg, Aspirin 250 mg, Metoprolol 25 mg, Enalapril 5 mg, Atorvastatin 80 mg and was admitted to cathlab for emergent coronary and cerebral angiography. Angiography showed thrombotic subocclusion of mid (LCX) artery and occlusion of the (MCA) in M1 segment. Subsequent PCI of LCx with DES implantation and thrombectomy from MCA was performed uneventfully achieving TIMI 3 and TICI 3 flow respectively. After few hours, a progressive clinical improvement was observed resulting in reduction of NIHS score to 3. After 3 days, the neurological symptoms were completely eliminated. He was discharged in satisfactory condition.

Conclusions: Optimal treatment of simultaneous ischemic stroke and myocardial infarction is crucial. It may be a complex task and thus should be performed by experienced team of cardiologist, neurologist, critical care specialists and endovascular surgeon. It is necessary to choose an early invasive approach and develop this strategy in the vascular centers.
Acute hypertensive response in ischemic stroke or TIA patients

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Background: Acute hypertensive response (AHR) in acute stroke is associated with adverse outcomes; however its prognostic impact in ischemic stroke remains unclear. We aimed to investigate the prognostic significance of AHR in patients with ischemic stroke or TIA, and further examined the relationship between AHR and myocardial function.

Material and Methods: A total of 244 consecutive patients with acute ischemic stroke (AIS) (n=192) or TIA (n=52), who were evaluated with two-dimensional speckle-tracking echocardiography (2D-STE) within 7 days from admission, were retrospectively analyzed. The primary endpoint was a composite of major adverse cardiovascular and cerebrovascular events (MACCE) including death, myocardial infarction, or recurrent ischemic stroke.

Results and Conclusion: Among study population, AHR was observed in 161 (66%) patients. During a mean follow-up of 21.0 ± 12.5 months, 29 patients (11.9%) (25 [15.5%] AHR vs. 4 [4.8%] No AHR, p = 0.014) reached the primary endpoint. A Kaplan-Meier curve revealed that patients with AHR had a significantly higher incidence of MACCE than those without AHR (log-rank p = 0.013). Multivariate Cox regression analysis demonstrated that AHR (adjusted hazard ratio [HR] 4.60, 95% confidence interval [CI] 1.31–16.15) was a strong predictor of MACCE. In multivariate logistic regression analysis, left ventricular global longitudinal strain (per 1% decrease) showed a significant relationship with AHR (adjusted odds ratio [OR] 1.17, 95% CI 1.02–1.35). AHR may be a poor prognostic marker in patients with AIS or TIA.
P06F

Pulse Wave Velocity in patients with Hypertensive Urgency

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Background: Hypertensive crisis (HC) is defined by the systolic pressure higher than 180 mm Hg or diastolic pressure higher than 120 mm Hg and it can be the first manifestation of arterial hypertension. Pulse Wave Velocity (PWV) is the measure of arterial stiffness which is directly connected to cardiovascular risk and hypertension mediated organ damage.

Methods and materials: Study included 17 patients presenting with hypertensive urgency (HC without target organ damage) to the Emergency room (ER) of Clinic for Internal Medicine, through 3 months duration. Arterial stiffness was measured with a noninvasive method using “Agedio B900” device, operating on the principle of oscillometry.

Results: Average age of patients was 64.18 ± 10.87 years. 58.82% were female and 41.18% were male. Average brachial systolic BP was 191.17 ± 10.98 mm Hg. Average central systolic blood pressure was 149.23 ± 18.93 mm Hg, and average central diastolic blood pressure was 99.23 ± 17.22 mm Hg. PWV for each patient was higher than the reference range for age with values of 10.5 ± 2.01 m/s. Median of increased vascular age compared to biological age of patients was 8 years. Student's t-test showed statistically significant difference between PWV measured in males and females (M 9.15 ± 1.01, F 11.24 ± 2.04; p=0.008). Values of PWV showed a positive correlation with age (r=0.9471, p<0.00001). Central systolic blood pressure shows a weak positive correlation with PWV (r=0.5225, p=0.03).

Conclusions: This study showed that the patients presenting to the ER with hypertensive urgency have higher PWV values when compared to the reference range and to patients with resistant hypertension. Although hypertensive urgency does not imply target organ damage, patients have increased cardiovascular risk, which is directly connected to PWV. Additional research is required about long term predictive worth of PWV measured during hypertensive crisis including hypertensive emergency.
P07F

Not all unilateral weakness are stroke and rare case of venous sinus thrombosis

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This 70-year-old Lady transferred from other hospital with right-sided weakness. On history taking, she is having these symptoms off and on over a week and also complaint of headache. BG – IHD, PPM. On examination, NIHSS –22/42. CT head – bleeding around the left thalamic area. But very atypical pattern of bleeding. Subsequently arranged for CT Venogram which showed non enhancement of the anterior aspect of superior sagittal sinus with surrounding haemorrhagic infarct area.

Started on anticoagulation and patient’s condition improved by mean time. Despite thorough investigation no particular underlying cause was found out. Patient was discharged after a period of rehabilitation.

Discussion: Cerebral Venous Sinus Thrombosis is a relatively uncommon but serious neurological disorder that is potentially reversible with prompt diagnosis and appropriate medical care. But diagnosis can be quite challenged due to varied and mimicked patterns. Predisposing risk factors can be found in most cases. Women are particularly more affected.

Conclusion: CVST is a challenging condition due to its wide range of clinical presentation. Despite that, owing to its rare and serious nature of disease, clinicians should pay more emphasis on its various symptoBut definitive diagnosis can be made by Imaging like Magnetic Resonance Venography. And it is also important to exclude the all possible underlying risk factors.

P08F

**Active Monitoring for Atrial Fibrillation (AMALFI): protocol and pilot from a mail-based randomized trial of screening for subclinical atrial fibrillation in high-risk individuals**

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**Background:** It is unknown whether screening for subclinical atrial fibrillation (SCAF) is an effective strategy for preventing cryptogenic strokes.

**Material and methods:** AMALFI is a streamlined trial comparing 14-day continuous electrocardiographic monitoring for SCAF (Zio Patch) versus usual care in people without previous AF or atrial flutter (AFL). Patients ≥65 years with CHA2DS2-VASc score ≥3 in men or ≥4 in women are eligible. The primary endpoint is AF prevalence at 2.5 years as documented in primary care records. Participants are identified via electronic search of primary care records and invited to join by mail. Those randomized to the active arm are sent a patch to wear for 2 weeks. The device is returned for analysis and results provided to the participant’s GP. A 2-week screening with Zio Patch may identify AF in ≃3.75% in this high-risk population, with additional cases identified subsequently during usual care. We estimate an annual incidence of AF of ≃0.7% in the control group. Hence, a trial of 2500 participants gives >90% power at 2p<0.05 to detect the estimated difference in AF prevalence.

**Results:** A pilot phase was conducted in two GP practices. 1208 invitations were sent to potentially-eligible patients and 284 (23.5%) agreed to participate. 82% (117/143) of patients allocated to receive a patch both wore and returned it. 6% (8/143) patches were returned unused, and 13% (18/143) were not returned. Median wear-time was 13 days 22 hours, with a median of 97.6% analysable tracing, yielding a diagnosis of AF/AFL in 6 reports (5.1%).

**Conclusions:** This mail-based approach with identification and follow-up via routine health records seems feasible. Around one quarter of potentially eligible patients are recruited, and most seem willing to wear and return their patches. AF detection rates are in line with predictions. Recruitment is ongoing, with main study results expected in 2023.
P09F

Serial magnetic resonance imaging after electrical cardioversion of recent onset atrial fibrillation in anticoagulant-naïve patients – a prospective study exploring clinically silent cerebral lesions

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Background
Patients with atrial fibrillation (AF) have a high incidence of cognitive impairment, which may be related to clinically silent microembolism causing cerebral infarctions. The objective of study was to explore the occurrence and timing of silent brain lesions following electrical cardioversion (CV) of recent onset AF in anticoagulant-naïve patients and to further study related effects on cognitive function and biomarkers of cerebral damage, S100b.

Material and methods
Patients with AF duration < 48 hours were prospectively included. Brain magnetic resonance imaging (MRI) and S100b, were obtained prior, after and 7-10 days following CV. Trail making tests (TMT-A and TMT-B) and their difference, ΔTMT, were assessed prior to CV, 7-10 days and 30 days after CV.

Results
Forty-three patients (84% males) with median CHA2DS2-VASc score 1 (interquartile range 0-1) were included. Sequential MRI, including diffusion weighted scans, showed no new brain lesions after CV. Chronic white matter hyperintensities were present at baseline in 21/43 (49%) patients. The S100b(µg/l) levels increased significantly from baseline, (mean±SD) 0.0472±0.0182 to 0.0551±0.0185 after CV, p=0.001 and then decreased 7-10 days after CV to 0.0450±0.0186, p<0.001. Consecutive TMT scores improved successively after CV, being statistically and clinically significant for TMT-B (p<0.01) and ΔTMT (p=0.005) between 7-10 days and 30 days after CV (Reliable Change Index >1.96).

Conclusion
New brain lesions could not be detected on MRI after CV, but the high incidence of white matter hyperintensities and the transient increase in S100b may indicate transient or minor brain damage undetectable by MRI thus heightening the need to reevaluate thromboembolic risk prior to CV even in low risk patients.
P10F

Machine learning approaches for prediction of 1-year risk of major bleeding events in anticoagulated atrial fibrillation patients in Wales.

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Introduction: Major bleeding events are the most serious complications of anticoagulation therapy (AC) in Atrial Fibrillation (AF) patients, with standardised bleeding risk scores used to guide therapy selection in practice. We explored whether a machine learning (ML) approach could improve bleeding risk modelling.

Methods: We developed two ML-based decision support systems and compared their performance with the HAS-BLED score for prediction of 1-year risk of major-bleeding events in the AC treated Welsh AF population. Multiple data sources were linked to capture potential contributing clinical variables. HAS-BLED was validated using multivariate logistic regression. Bootstrapping and 5-fold cross validation were used for development of Random Forest (RF) and Naïve Bayes (NB) ML algorithms. Incident event rate in relation to contributing factors were used for model optimization. Hazard ratios of the respective models were evaluated using Cox proportional hazard ratio modelling. McNemar test was used for evaluating marginal homogeneity of the final models.

Results: Clinical data were analysed throughout 2017 for 38,784 (43.5% female) AC treated AF patients (aged 76±9.84 years). Baseline HAS-BLED and CHA2DS2VASc scores were 2.18 (CI [2.17, 2.19]) and 3.45 (CI [3.44, 3.46]) respectively. During 37,133 person-years 2,416 bleeding events occurred (6,506 per 100,000 patients/year). Age>75, female-sex, heart failure, prior-bleeding and chronic kidney disease stage 4-5, excessive alcohol intake, regular nonsteroidal anti-inflammatory drug use, incident liver disease and INR>5 were significant predictors of bleeding. The RF model achieved the highest AUC=71.1% (sensitivity=94.93% and specificity=6.9%) compared to: HAS-BLED (AUC=69.2%), NB (AUC=64.3%) and logistic regression (AUC=60.5%). McNemar’s test showed the RF model improved prediction vs HASBLED (p<0.001).

Conclusion: RF modelling achieved a small but significantly better prediction of bleeding than conventional HAS-BLED score, indicating a potential role for ML-based decision support algorithms to optimise evaluation of bleeding risk in AF patients on or considering AC treatment.
P11F

Sternal Wound Infection and Risk of Atrial Fibrillation in Patients undergoing Cardiac Surgery

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Background:
Atrial fibrillation (AF) is a common and potentially morbid complication following cardiac surgery. Its pathogenesis likely involves interplay between pre-existing physiological conditions and local and systemic inflammation. The goal of this study was to assess whether patients with sternal wound infection (SWI) after cardiac surgery were at higher risk of AF development.

Material and methods:
We examined 338 patients (221 male, 62±13 years, LVEF 57±10%, in sinus rhythm at baseline) who underwent valve surgery and/or coronary artery bypass graft, followed by in-hospital rehabilitation. For each patient, we retrospectively assessed SWI onset and AF development at rehabilitation time after cardiac surgery.

Results:
Of 338 patients, 285 (84.4%) patients underwent valve surgery and 53 (15.6%) coronary artery bypass. Overall, during in-hospital rehabilitation 88 (26%) patients developed AF and 31 (9.2%) developed SWI. In SWI group, AF was observed in 14 (45.2%) patients while in no-SWI group, AF occurred in 74 (24.1%) patients (p=0.011). Baseline clinical characteristics in terms of hypertension, diabetes, coronary artery disease, peripheral artery disease, chronic renal failure, atrial fibrillation history were no different between SWI and no-SWI groups (p=0.692, p=0.503, p=0.874, p=0.233, p=0.654, p=0.390 respectively).

Conclusion:
After cardiac surgery, patients with SWI are more likely to develop AF than patients with no-SWI, irrespective of the baseline clinical features.
P13F

**Regression Tree Algorithm to Select Patients for Early Holter Monitoring: Large Vessel Occlusion plus Enlarged Left Atria to Detect AF**

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**Background**

Our aim was to determine whether the combination of acute stroke phase parameters along with left atrial dysfunction markers could be useful to predict AF within the first 30 days of Holter monitoring.

**Material and methods**

Crypto-AF was a prospective study to detect AF in non-lacunar cryptogenic stroke patients aged 55 and above. We developed predictive models and decision tree analysis with neurologic and cardiac variables. We collected: National institute of Health Stroke Scale (NIHSS); vascular occlusion; cerebral infarction pattern; NT-ProBNP and BNP levels; ECG analysis (duration, amplitude of P wave and PTVF1); Holter analysis (atrial premature beats); left atrial volume indexed to body surface (LAVI) and left atrial peak atrial strain.

**Results**

We included 264 patients who completed the 28-day Holter monitoring period. Vascular occlusion was an independent predictor of AF detection OR 5.78 (1.94-17.27) (p = 0.0017). The predictive model for AF risk including cardiac and neurologic variables (age, LAVI, BNP, vascular occlusion and peak atrial longitudinal strain) was more accurate (AUC 0.8169, sensitivity 85.18%, specificity 71.11%) than the model including only clinical data (age, NIHSS, CHA2DS2-VASc score) (AUC 0.6152, sensitivity 54.54%, specificity 66.87%). The decision tree showed that in patients with vascular occlusion the risk of AF was doubled (OR 2.37) and in those with vascular occlusion and LAVI> 28.5 the risk was 10-fold higher (OR 10.21).

**Conclusion**

Vascular occlusion was an independent predictor of 28-day AF detection. The combination of vascular occlusion and left atrial enlargement multiplied the risk of AF.
Cardio embolic stroke in heart failure: a retrospective study of demographics, clinical profile, risk factors and outcome in a tertiary care hospital

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BACKGROUND:
Role of heart failure (HF) itself as a risk factor for cardioembolic stroke (CES) is controversial. Most studies patients with HF and CES did not differentiate between patients with and without atrial fibrillation (AF). We aim to study demographics, clinical profile and risk factors for CES in patients with HF, determine their impact on outcome and outline the possible role of anticoagulants for stroke prevention in patients of HF without AF.

MATERIALS AND METHODS:
Data of 172 patients of acute CES was retrospectively analysed. Patients divided in three subgroups: presence of AF only (group 1), HF in normal sinus rhythm (NSR) (group 2) and HF with AF (group 3).

RESULTS:
112 patients were in group 1, 28 patients in group 2 and 30 patients in group 3. 27 patients in group 3 had a past history of AF, only 1 was on anticoagulation. Etiology of HF was: RHD in 3.5%, Ischemic cardiomyopathy in 34.5%, Non-ischemic cardiomyopathy in 55.1%, HFpEF in 6.9%. CHADS2VASc score in group 3 was significantly higher than in group 1(p <0.00001). Highest mortality seen in group 3(p <0.001).

Amongst patients with HF, factors associated with in hospital mortality included AF(p=0.001), age(p<0.05), and diabetes mellitus(p<0.05).

Difference in degree of disability amongst survivors assessed by score was not statistically significant.

CONCLUSIONS:
HF, with or without AF, is an important risk factor for cardio embolic stroke and is associated with high mortality rates.
Patients with concomitant AF and HF are associated with worse outcome and highest mortality. A significant number of patients with HF and CES are in NSR with mortality and degree of disability comparable to those with AF alone. Similar to CHADS2VASc, risk stratification scores should be developed in patients with HF who are in NSR and anticoagulation for stroke prevention should be considered.
Development and internal validation of a prediction score for 10-year ischaemic stroke mortality

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Background: Many prognostic scores have been developed to assess outcomes of patients after stroke. However, so far none of them can predict 10-year mortality.

Material and methods: We extracted data for 10,366 patients who had their first-ever ischaemic stroke from the Norfolk and Norwich Stroke and TIA Register. A Cox model was used to predict the chance of 10-year post-discharge mortality. The predictors included were age, sex, the Oxfordshire Community Stroke Project classification, estimated glomerular filtration rate (eGFR), pre-admission modified Rankin Score, admission blood data (haemoglobin, sodium, white blood cell count) and comorbidities (atrial fibrillation, coronary heart disease, heart failure, cancer, hypertension, chronic obstructive pulmonary disease, liver disease and peripheral vascular disease). The model was internally validated using the optimism-adjusted c-statistic obtained by bootstrapping. It was subsequently converted into a nomogram for clinical use.

Results: Mean age was 77.8 years (standard deviation 12.1 years), 52% (5,481) female. Most strokes were classified as partial anterior circulation syndromes (36.21%). Predictors of 10-year mortality were total anterior circulation stroke [hazard ratio (HR) (95% confidence intervals (CI)) 2.77 (2.53,3.03)], eGFR lower than 15 [1.92 (1.48-2.48)], 1-year increment in age [1.04(1.04-1.05)], liver disease [1.54(1.23-1.93)], peripheral vascular disease 1.44(1.26-1.63), cancers 1.36(1.26-1.47), heart failure 1.24(1.12-1.34), higher pre-admission Rankin Score 1.21(1.18-1.23), atrial fibrillation 1.18(1.11-1.26), coronary heart disease 1.09(1.02-1.17) and chronic obstructive pulmonary disease 1.13(1.02-1.25). Hypertension was found to have a protective effect [0.77 (0.72-0.82)]. Optimism-adjusted c-statistic was 0.74.

Conclusion: A simple mortality score identifies the patients who will have a poor prognosis over 10 years and allows clinicians to plan their management accordingly. It uses patient data available on admission and may be calculated by all clinicians on an easy to use nomogram. Although the model discriminated well between patients at low and high risk, external validation is required to assess generalisability of the score.
P17F

The Challenge – Patient with Embolic Stroke of Unknown Source (ESUS)

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Background:
About one in four patients is diagnosed with embolic stroke of unknown source (ESUS). ESUS is defined as brain infarction that is not attributable to major cardioembolism, atherosclerosis or small vessel occlusion. It is a diagnosis of exclusion that clearly depends on diagnostic modalities and the experience of the physicians. Potential etiologies of cryptogenic stroke are minor-risk potential cardioembolic sources, cancer, covert paroxysmal atrial fibrillation, arteriogenic emboli and paradoxical embolism. The aim of this clinical case report is to highlight the importance of further clinical testing in young patients with ESUS, since that could have significant implications in terms of secondary stroke prevention and therapy.

Material and Methods:
We report a case of 33-year-old man with no risk factors, who was admitted to neurology department because of loss of peripheral vision. Neurological examination revealed left hemianopsia and quadri hyperreflexia. Computed tomography (CT) and magnetic resonance imaging (MRI) confirmed right posterior cerebral artery and arteria choroidea anterior ischemic stroke. Physical examination, laboratory tests, ECG and Color Doppler of extracranial arteries were unremarkable.

Results:
The patient was directed to Cardiology department for further evaluation. He underwent transcranial contrast Doppler sonography and transesophageal echocardiography (TEE) which showed atrial septal aneurism and patent foramen ovale with significant right-to-left shunt. After screening for thrombophilia the patient was scheduled for percutaneous closure of PFO the following month. After the procedure he was discharged in a satisfactory condition with following anticoagulant therapy for a year.

Conclusion:
The ability to define the etiology of stroke in young patients has significant impact not only on patient outcome but also on secondary stroke prevention. Interdisciplinary team is needed to perform the ESUS work up.
P18F

**Direct cost related to stroke in a European country: a longitudinal analysis**

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Background: After discharge from a rehabilitation hospital, stroke survivors and their families may face considerable stroke-related direct costs. The total amount could be ascribed to the costs of formal and informal care and to the equipment or materials needed for care.

Objectives: This study aims to describe the direct costs incurred after a stroke by survivors during their first post-stroke year and to analyze the basic predictors of these costs.

Methods: Stroke survivors (n = 415) were enrolled for this study during discharge from rehabilitation hospitals (baseline) and interviewed at 3, 6, 9, and 12 months after discharge for a longitudinal study. The trend of the direct costs incurred during the follow-up (from T1 to T4: n = 239) was evaluated using a linear mixed-effects model. The mixed-effects model was used to identify the baseline predictors of the incurred direct costs from the stroke survivors.

Results: During the first year after discharge, stroke survivors spent approximately $3,700 on stroke-related direct (i.e., medical and non-medical) costs. The highest direct costs occurred during the first six months, although there was not a significant change over time. The higher direct costs incurred were predicted by the linear effect of time, by the educational level (higher vs. low) and by the lower Barthel Index score, while a higher perceived cost was predicted only by the linear effect of time and by the lower Barthel Index score.

Conclusion: In the first post-stroke year, direct costs have remained stable over time and can be predicted by the level of education and physical functioning. The identification of specific direct cost predictors would be helpful for developing more socially and economically tailored interventions for stroke survivors in their first year after their stroke.
P19F

A comparison of stroke in young and older adults admitted at a large tertiary hospital in Tanzania

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Background: There is a rise in stroke burden in young adults attributed to unique risk factors inherent to genetics and the environment associated with devastating outcomes. There is paucity of data on the magnitude, risk factors and 30-day outcomes of stroke among young adults in Tanzania. Aim: To determine the prevalence of first ever stroke, describe stroke sub types, risk factors and 30 day outcomes in young adults (≤45 years) compared to older adults (>45 years).

Methods: This cohort study recruited 369 first ever stroke participants admitted at a tertiary hospital in Tanzania with a World Health Organization criteria for stroke. Demographics, stroke risk factors were captured, stroke severity was assessed using the National Institute of Health Stroke Scale. Each participant was followed up to 30 days using the Modified Rankin Scale. Stroke prevalence and risk factors in the young were compared to old adults. Kaplan Meier analysis was used to estimate 30-day survival.

Results: The prevalence of stroke in young adults was 25.4% (95% CI 21.5% - 29.3%) and in 26.8% (95% CI 23.9% - 29.6%) older adults. Hemorrhagic stroke occurred in 42.3% among the young vs 27.2% in old p=0.005. Factors associated with stroke in the young compared to the old were: new history of hypertension 26.8% vs 9.3% p<0.001, HIV infection 11.4% vs 4.9% p=0.021, illicit drugs 4.1% vs 0.8% p=0.044, hormonal contraception 48.5% vs 9.4% p<0.001, mitral stenosis 3.3% vs 0% p=0.012, and sickle cell disease 9.7% vs 4.2% p=0.047. Majority of the participants had severe stroke and at 30 days the fatality rates were 49.1% in young vs 67.2% in older adults.

Conclusion: The high burden of stroke in young is coupled with high 30-day fatality rates. Young strokes have special risk factors that should be screened and controlled to prevent subsequent development of stroke.
P20F

Plasma amyloid-β monomers and the risk of clinical cardiovascular disease in the general population: the Rotterdam Study

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Background: Amyloid-β is a hallmark of Alzheimer’s disease (AD), and acts in conjunction with cerebrovascular pathology on the risk of dementia. Amyloid-β is abundant in the circulation, but its systemic role in various manifestations of vascular disease remains undetermined.

Material and methods: Between 1990 and 1993, plasma levels of amyloid-β40 and -β42 (Aβ40 and Aβ42) were measured in a random subset of 1815 participants of the population based Rotterdam Study (mean age 69 years, 62% women). We determined the associations of plasma amyloid with prevalence and 20-year risk of cardiovascular disease (CVD), including coronary heart disease (CHD) and stroke, in comparison to previously established AD risks. Subclinical atherosclerosis was quantified at baseline by carotid ultrasound.

Results: At baseline, 220 individuals had CVD (131 CHD and 95 stroke), and 56 had AD. Higher Aβ40 was associated with the presence of CVD (odds ratio [95% confidence interval] per standard deviation: 1.50 [1.17-1.91]), similar for CHD and stroke, compared to a two-fold increase in odds of dementia (OR 1.94 [1.19-3.18]). During follow-up, 543 individuals developed CVD (306 CHD and 371 stroke), and 273 AD. Higher baseline Aβ40 was not associated with overall CVD risk (HR 1.01 [0.88-1.17]) or stroke (HR 0.96 [0.81-1.14]), but individuals with higher Aβ40 were at increased risk of CHD (HR 1.26 [1.02-1.56]), similar to AD (HR 1.27 [1.03-1.56]). Lower Aβ42 was strongly associated with prevalent and incident dementia (RR≥1.53), but not with any type of CVD (all RR <1.17). Neither Aβ40 nor Aβ42 were associated with the burden of subclinical carotid artery atherosclerosis.

Conclusions: Higher plasma levels of Aβ40, but not Aβ42, are associated with risk of cardiovascular disease. Further study is warranted into potential shared aetiological mechanisms by which Aβ40 could be involved in cardiovascular and Alzheimer’s disease.
P21F

**Emboli of the heart as a cause of stroke-case series**

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**Background:** Cardiogenic embolism has been source of 15-30% in all cases of ischaemic stroke, and these strokes have high mortality rate. The most common cause of cardiac embolisation in the brain is atrial fibrillation. We have analysed other cardiac causes of embolisation such as acute myocardial infarction, valvular heart disease, infectious endocarditis and tumors of the heart.

**Material and Methods:** Our case series consists of four patients who were diagnosed with cardiac embolism during hospitalisation for a stroke. Retrospective, observational analyses include data from the hospital information system and echocardiographic pictures.

**Results:** First patient, male, age 48, hospitalized in neurology clinic under the clinical picture of stroke-neurological score NIHSS 7, RANKIN 3. Transthoracic echocardiography revealed tumor change of 10 mm at aortic valve with high embolic potential. Second patient, female, age 30, treated for recurrent stroke-neurological score NIHSS 11, RANKIN 5. Transesophageal echocardiography revealed foramen ovale apertum of 5 mm. Third patient, female, age 31, NIHSS 7, RANKIN 5 who had on transthoracic echocardiography detected hyperechogenic formation 10x8 mm on anterior mitral cusp with high embolic potential. Fourth patient, male, age 58, hospitalized for stroke-neurological score NIHSS 6, RANKIN 4. Transthoracic echocardiography describes akinesia of the apex, apical 2/3 of anterior wall with a prickly thrombus at the apex of the heart with high embolic potential.

**Conclusion:** Echocardiography can provide comprehensive information of thromboembolic risk in patients with stroke.

**Abbreviations:** NIHSS- National Institutes of Health Stroke Scale; RANKIN- Rankin Scale for Neurologic Disability; mm-millimeters;
P23F

Carotid plaque composition and the risk of stroke and mortality

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Background
Atherosclerotic disease in the carotid bifurcation remains a major risk factor for ischemic stroke. The vulnerability of a atherosclerotic plaque to rupture and cause a subsequent stroke is determined by the plaque composition. Magnetic resonance imaging (MRI) techniques allows detailed investigation of the composition of the carotid plaque. Hence, we examined carotid plaque composition in relation to risk of stroke and mortality in a population-based setting.

Materials and Methods
Between 2007 and 2012, 1271 persons (mean age: 72 years, 51% women) from the population-based Rotterdam Study, in whom carotid ultrasonography showed subclinical atherosclerosis, underwent high-resolution MRI of the carotid arteries to assess plaque composition [presence of intraplaque hemorrhage (IPH), lipid-rich necrotic core (LRNC), and calcification]. All persons were continuously followed for the occurrence of stroke or death until January 1, 2015. We used Cox regression models to assess the association of IPH, LRNC, and calcification with the risk of stroke and mortality with adjustments for age, maximum plaque thickness, and cardiovascular risk factors. All analyses were performed for men and women separately.

Results
During a median of 5.5 years of follow-up, 49 persons (26 women) suffered a stroke and 267 persons (142 women) died. Independent of plaque thickness and cardiovascular risk factors, the presence of IPH increased the risk of stroke and mortality in women [fully adjusted hazard ratio (HR): 2.97 (95%CI:1.22;7.23), and 1.73 (95%CI:1.14;2.64)]. Presence of IPH also increased the risk of stroke and mortality in men, albeit statistically non-significant [fully adjusted HR: 2.00 (95%CI: 0.81:4.97), and 1.42 (95%CI:0.98:2.05). Presence of LRNC and calcification were not associated with stroke or mortality.

Conclusions
The presence of IPH in atherosclerotic carotid plaques appears to be strong marker of plaque vulnerability and a strong risk factor for stroke and mortality, particularly in women.
Urgent echocardiography in stroke patient: necessity of protocol selection criteria?

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BACKGROUND: Etiological workup is the initial assessment of neurologists in stroke patients, which can often be delayed due to abundant request of cardiac imaging in hospitals.

Incidental finding of LV thrombus may be very surprising and is a feared complication of MI. Reducing the delay of diagnosis allows an appropriate management and better outcome.

MATERIAL METHODS: 35Yo male, no past significant cardiac/neurologic medical/family history. His risk factors include active smoking and sedentary lifestyle.

The patient is brought into the ER for left hemiparesis and slurred speech, without cardiac complains.

An MRI is performed revealing ischemic cortical lesion of the right hemisphere, right sylvian region. Due to his late arrival, the patient did not benefit of an urgent thrombolysis.

The ECG is within normal limits and the Troponine cycle is found stable, not evoking acute cardiac injury.

The patient is admitted in neurology for ischemic stroke and treated with antiplatelet therapy.

The lipid panel shows a slightly raised LDL cholesterol and Tryglicerides, statin is initiated.

For etiological purposes a 24h Holter ECG is performed showing normal sinus rhythm, without arrhythmia.

The doppler echography of the supraaortic stem is normal.

An echocardiography is requested and planned in 6 days.

RESULTS: 6 days later, the echocardiography reveals a massive apical thrombus with global LV hypokinesia. Cardiologists conclude to a silent MI, severe low EF and massive LV thrombus.

CONCLUSIONS: No features were encountered suggesting cardiac etiology of the stroke, yet a massive LV thrombus was detected 6 days after initial diagnosis.

Criteria protocols should be made to give faster access to echocardiography in selected patients.

The lack of awareness and shortage of echocardiographers in hospitals, show the urgency of establishing proper protocols to define urgent selection criteria for those needing rapid echocardiography, and therefore reduce the delay of appropriate management and fatal outcome.
Echocardiographic predictors of major adverse cardiovascular events: a retrospective study of stroke patients

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Introduction:
Clinical features and risk factors that consistently predict MACE’s (major cardiovascular events) in stroke patients have been identified, however echocardiographic predictors are less well defined and studied.

Objective:
To determine which echocardiography findings are associated with MACE’s in an ischemic stroke population.

Materials and methods:
Retrospective study of 170 patients with ischemic stroke selected from a population admitted to a stroke unit, with a mean follow-up of 5.5 years. X2 test was used to analyze the demographic and echocardiographic characteristics of the population. The independent predictor value of echocardiographic findings was evaluated by logistic regression.

Results:
The mean age of patients was 65.21 ± 14.2 years, 48.8% were men, 57.6% had hypertension, 33.5% had dyslipidemia, 21.8% had diabetes and 12.9% had atrial fibrillation. During the follow-up 34.1% (n=58) had MACE’s. During the follow-up 43.8% vs 10% patients with left atrial > 48ml/m2 (p<0.001), 29.5% vs 10.3% patients with dilated right atrial (p<0.03) and 27.5% vs 2.1% patients with moderate to severe mitral regurgitation (p<0.000) had MACE’s. The presence of moderate to severe mitral regurgitation was an independent predictor of MACE’s (OR 37.95, p<0.001).

Conclusions:
Having moderate to severe mitral regurgitation was the only independent predictor of MACE in our ischemic stroke population.
P28F

Cardioembolic stroke: what to search in the echocardiogram?

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BACKGROUND
Investigation of potential embolic source is an important diagnostic step in treating patients with ischemic stroke and echocardiography is a widely used and versatile technique useful in this situation.

MATERIAL AND METHODS
Analysis of all echocardiograms performed in patients admitted in a Cerebrovascular Unit due to an ischemic stroke during a year (188 patients), determining differences between cardioembolic (group 1) and non-cardioembolic (group 2) sources.

RESULTS
According to TOAST, there were 19,1% strokes of cardioembolic source, without any difference in demographics between both groups. Previous atrial fibrillation was more common in group 1 (44,4% vs 5,3%), as well as ischaemic cardiomyopathy (16,7% vs 9,9%) and heart failure (8,3% vs 3,9%); on the other hand, dyslipidemia (13,9% vs 35,5%) and smoking habits (5,6% vs 17,1%) were much more frequent in other ethiologies.

Echocardiogram showed that the prevalence of mitral valve disease (75% vs 50%) was much more significant in group 1 as well as left atrial (LA) enlargement (86,1% vs 20,4%) and left ventricular (LV) dysfunction (33% vs 18,4%). Regurgitating mitral valve was the most frequent valvular abnormality found and it was moderate to severe in 33,3% of group 1 patients (vs 18,4% in group 2). Cardiac chamber enlargement was more frequent in group 1: average LA volume was 54ml (vs 34ml) and right atrium and LV enlargement were more common (47,2% and 11,1% vs 5,9% and 3,3%, respectively). Despite LV dysfunction was found more in group 1, there was no significant difference in its severity in both groups.

CONCLUSIONS
In our population, we found that several echocardiogram abnormalities were related to cardioembolic stroke, as mitral valve regurgitation severity, LA enlargement and LV dysfunction, so we propose that this variables might be used to create a risk score of cardioembolic stroke.
P30F

Prevention of atrial fibrillation thromboembolic complications by left atrial appendage occlusion in patients following intracranial hemorrhage: postprocedural antithrombotic strategies and clinical outcomes

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Background. Left atrial appendage occlusion (LAAO) is a stroke prevention therapy for patients with non-valvular atrial fibrillation (AF). Patients with previous intracranial bleeding while on oral anticoagulant (OAC) represent challenge with respect to postprocedural antithrombotic medication. We evaluated antithrombotic strategies, procedural, and early clinical outcomes in small series of patients who underwent LAAO following intracranial bleeding on OAC.

Material and methods. A total of 6 patients were recruited, aged 71±1 years; 93% of patients were male. An Amplatzer Amulet LAA occluder was implanted in all cases. Clinical events were recorded by visit at 3 mnth, 6 mnth, and 12 mnth.

Results. One third of patients had history of stroke, 43 % heart failure, and 66 % arterial hypertension. The CHA2DS2-VASc and HAS-BLED scores were 3.7±1.2 and 3.2±0.4, respectively. An LAA occluder was successfully implanted in 100 % of cases, without periprocedural complications. Pre-discharge transoesophageal echocardiography (TEE) showed residual flow (< 5 mm) in one (16 %) patient, which was reduced to < 3 mm at 45 days, and no residual flow was detected 6 months post implant. Antithrombotic regime at discharge included dual antiplatelet therapy in 5 patients, and apixaban 2.5 mg bid plus aspirin (NOAK + ASA) combination in patient with detected flow. At 3 months, 5 patients were switched on aspirin, and one remained on NOAK + ASA. At 6 months, all patients were on aspirin alone. No device-related thrombi were detected by TEE. No thromboembolic or bleeding complications were detected within 6 to 12 month follow-up.

Conclusions. Data from our small series suggest that in patients after intracranial bleeding and at high-risk for stroke receiving LAAO with an Amplatzer Amulet device, a discharge regimen of dual antiplatelet therapy or low dose of NOAK and aspirin for a limited period of time, is safe and appropriate therapy.
P31F

**Indications and eligibility for percutaneous left atrial appendage occlusion in patients with atrial fibrillation admitted in a tertiary cardiology department**

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**Background:** Percutaneous left atrial appendage occlusion (LAAO) is an alternative non-pharmacological therapeutic option for stroke prevention in patients with non-valvular atrial fibrillation (NVAF), in whom long-term oral anticoagulants (OACs) is not considered a first-choice therapy. However, contraindications to OAC are not well defined so the actual indication for LAAO is underdetermined. This study aimed to identify the percentage and the clinical characteristics of patients with NVAF, who have a potential indication for LAAO.

**Material and methods:** This analysis included patients from the MISOAC-AF study (Motivational Interviewing to Support OAC-AF, ClinicalTrials.gov: NCT02941978), a prospective, randomized controlled clinical trial, conducted in a tertiary hospital between 2015 and 2017. Common criteria for contraindications to OACs and inefficiency of adequate OAC treatment were assessed. A history of previous major bleeding, a HASBLED score ≥3 and stroke on OACs were evaluated separately and as a composite clinical endpoint.

**Results:** Patients with NVAF (n=995) fulfilled the study enrolment criteria. A total of 545 (54.8%) were males and their median age was 76 years (IQR:68-82). A history of bleeding was present in 308 (31.0%) patients. Previous major bleeding was present in 139 (14.0%) patients, and previous minor bleeding in 169 (17.0%). The mean HASBLED score was 1.7±1.0 and a score ≥3 was present in 208 (20.9%) patients. The mean CHA2DS2-Vasc score was 4.4±1.9 and 704 patients (70.8%) had a score ≥4. A total of 59 (6.0%) patients had a history of prior stroke while treated by OAC. The study composite clinical endpoint was met in 290 (29.1%) patients.

**Conclusions:** Almost 1/3 of the patients with NVAF admitted to a tertiary cardiology ward for any reason, may be considered for percutaneous LAAO according to the previous major bleeding events, the high HASBLED score (≥3) or the occurrence of stroke while on OAC treatment.
P32F

Malignant left atrial appendage morphology: current classification vs H-L system

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Background:
There is a subset of patients with atrial fibrillation that suffer recurrent embolic strokes despite appropriate anticoagulant therapy. In previous studies the risk of stroke recurrence has been associated with the left atrial appendage (LAA) morphology, knowing those with a greater embolic risk as malignant LAA (non-chicken wing morphology). LAA morphology is currently classified into four categories: chicken wing, windsock, cactus and cauliflower. Recently, it has been suggested a simpler classification with two categories: Low-risk (LAA-L) and High-risk (LAA-H) morphologies; which could be easier to apply and could correlate better with the risk of embolic stroke.

Material and methods:
Retrospective analysis from a registry of patients with recurrent embolic strokes despite appropriate anticoagulant therapy, in which LAA morphology had been studied with cardiac CT scan for LAA occlusion in our tertiary hospital. LAA morphology was classified according to the four current categories and H-L morphology by the same cardiologist.

Results:
A total of 26 cases were included in the analysis. We identified 22 (84.6%) chicken wing, 1 (3.8%) windsock and 3 (11.5%) cactus by the current classification system, while 15 (57.7%) were classified as LAA-H and 11 (42.3%) as LAA-L by the new system. Half of the 22 cases with chicken wing morphology were considered LAA-H by the new classification (11; 50%), whereas all non-chicken wing LAA were also classified as LAA-H morphology (4; 100%).

Conclusion:
Most cases were classified as chicken wing morphology, as opposed to other previous studies. However, applying the new classification system more than half of the cases were classified as high-risk morphology, which constitutes a more expected result in our series of malignant LAA.
P33F

**Cardioembolic ischemic stroke due to Libman-Sacks endocarditis in a patient with an atrial flutter ablation and a primary antiphospholipid syndrome anticoagulated with rivaroxaban.**

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**Background**

Cerebral vasculature is the most frequent location of arterial thrombotic events in antiphospholipid syndrome (APS) and the choice of long-term antithrombotic regimens still remains unclear in this context. Thus, supported by a literature review, we aim to share our experience in the management of a patient with an ischemic stroke due to a Libman-Sacks endocarditis in the context of an APS previously anticoagulated with rivaroxaban.

**Material and methods**

Case report and literature review including the terms “antiphospholipid syndrome” AND “stroke” in the thesaurus of Medline.

**Results**

We report the case of a 53-year-old male who after two episodes of deep vein thrombosis and two positive determinations of lupus anticoagulant was diagnosed with primary APS and started on acenocumarol for INR 2-3. Following, he presented atrial flutter which was treated with ablation. Next, while on INR 3.3, he presented a massive pulmonary embolism, suspending acenocumarol and starting rivaroxaban 20 mg. More recent, he suffered an acute ischemic stroke and a 14 mm aortic verruca was detected. Rivaroxaban was suspended and 3 weeks later he was started on acenocumarol for INR 2.5-3.5 and aspirin 100 mg indefinitely. Anti-beta-2-microglobulin and anti-cardiolipin IgG antibodies were present.

**Conclusions**

Several combinations of vitamin-K antagonists, low-molecular weight heparins and antiplatelet agents have been proven to be effective in secondary prevention for APS manifesting ischemic stroke. Rivaroxaban has been shown to be less effective than acenocumarol in this context. Further investigation is needed to unveil the best antithrombotic regimen according to each specific situation.
Giant Eustachian valve covered Large PFO Tunnel

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Background:
Eustachian valve (EV) is clinical importance in patients with Patent Foramen Ovale (PFO) because it increases the risk of paradoxical embolism and complicates percutaneous closure. Eustachian valve may cause false positive left-right shunt image, especially in TTE, and may also cause false negative results in terms of right-left shunt especially in contrast echocardiography performed from upper extremity.

Case Presentation:
A 38-year-old female patient with no known comorbidities was admitted to the emergency department due to weakness of the right upper extremity. She had a NIHSS score of 2 and diffusion MRI revealed hyperacute diffusion limitation in the left precentral gyrus. She was admitted to the stroke unit and dual antiaggregant treatment was initiated. Cardiologic examination was normal. ECG sinus rhythm. TTE left ventricular functions were normal, no significant valvular pathology was observed and color doppler right to left color flow was not observed although IAS was aneurysmatic. TEE revealed a prominent EV and a 1.9x0.7 cm PFO tunnel. Despite the agitated saline and valsalva maneuver given from the left arm, no right-to-left shunt was observed. Thereafter, the patient underwent TEE by inserting a femoral vein catheter in order to rule out the false negative result. Although she was given agitated saline via the right femoral vein, there was no right-to-left flow in the patient with significant PFO. Significant flow from right to left was observed after Valsalva maneuver. PFO closure plan was prepared for the patient.

Conclusion:
It is difficult to direct the contrast agent from the upper extremity towards the interatrial septum in cases with marked EV and this may cause false negative results in patients. In these patients, contrast enhancement from the femoral vein is a more reliable technique in right-left shunt evaluation, but it is difficult to perform in routine practice.
P36F

Atrial fibrillation and diabetes mellitus

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Introduction: The classical changes found in diabetic patients (interstitial atrial fibrosis and consecutive atrial dilatation) are known to be the main underlying causes blamed for the occurrence of atrial fibrillation in these patients.

Purpose: The substrate of this structural cardiac remodeling is probably due to a combination of factors that involve the chronic inflammatory process and oxidative stress.

Methods: A total of 257 patients admitted consecutively in our clinic were evaluated during hospitalization and after discharge periodically. The patients included have atrial fibrillation and diabetes mellitus. The patients were divided into 3 groups, depending on whether they have atrial fibrillation and/or diabetes. The follow-up period of 2.6 years performed included surveillance. Blood tests were performed for a more accurate stratification.

Results: In our study, 88 (34.24%) patients have both diabetes and AF, 96 (37.35%) have AF and no diabetes, and 73 (28.40) patients have diabetes and no AF. Patients with diabetes over 60 year of age have a high incidence of AF (84.43%). Once diabetes is compensated, 42 (16.34%) patients who revert spontaneously to sinus rhythm do so within 6.7 months of becoming compensated. Diabetes is recognized as a pro-inflammatory condition. The role of inflammation in the genesis of atrial fibrillation can not be neglected. Inflammation promotes electrical instability, but also structural remodeling.

Conclusion: Diabetes increases cardiovascular risk in patients with atrial fibrillation, especially if the diabetic patient has a history of heart failure, hypertension, stroke, vascular disease or is often elderly. Diabetes mellitus is an independent risk factor in patients with atrial fibrillation.
P37F

Specific Mechanisms of Arterial Hypertension in Reproductive and Menopausal Women

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Background.
The age-related alterations of estrogen content support the development of metabolic abnormalities, life quality deterioration, and sudden increase of cardiovascular diseases, arterial hypertension (AH), and high morbidity risk. The aim of the present investigation was the determination of estrogen-related mechanisms of AH.

Material and methods.
Women with AH (93 women) (Central Clinic of Tbilisi State Medical University (Georgia), 2009-2015) were investigated: 1 group - reproductive women (43 patients); 2 group - menopausal women (50 patients). Essential hypertension was defined as blood pressure, exceeding 160±10/90±10 mm Hg, for three consecutive measurements over a period of at least 4 weeks.

Results.
In women of menopause (but no of reproductive age), AH was estrogen-dependent. Disruption of lipid metabolism (LDL-CI, total Cl, TG) had a pathogenic role in the development of AH in reproductive and menopausal women. The estrogen-dependent character of alterations of NO content in the women's blood plays an important role in the pathogenesis of AH: a significant positive correlation was found between NO content and estrogen level. In the blood of women with AH in menopause, compared to the reproductive period, pronounced disbalance between the activity of pro- and antioxidant systems in blood was found. At the reproductive period, no statistically significant change in endothelin content in blood was observed in patients with AH, compared to healthy women; in the period of menopause, endothelin content in blood increased in women with AH. In menopausal women with AH content of the angiotensin-2 in blood increased in comparison to its level in healthy women; a negative correlation between levels of estrogen and angiotensin-2 content was revealed.

Conclusion.
Based on the results of this study, we recommend, in order to select an effective treatment, test the estrogen level in blood of hypertensive women in menopause.
P38F

Cardioembolic stroke: etiological factors besides atrial fibrillation.

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Introduction: Stroke is the third leading cause of death. The role of cardiovascular disease in the stroke is often underestimated. The timely diagnosis of cardiac pathology is very important and correction treatment is aimed at primary and secondary prevention of stroke. Purpose: To study the structure of heart disease in patients without carotid artery disease with CES in history.

Methods: The study included patients with a history of ischemic stroke. All patients were examined by ultrasound of the neck vessels. If there was no carotid artery disease, computed tomography angiography or digital subtraction angiography of the head and neck were made. Patients without vascular pathology of the brain and carotid artery disease were selected. Group of CES consisted of 120 patients. Every patient was examined by ECG, echocardiography, 24 hour holter ECG monitoring and biochemical tests. Patients with vasculitis and coagulopathy were excluded from the study.

Results: Most patients with stroke had hypertension (77.5%). Myocardial infarction was in 16.6%, valve replacement in 2.5%, coronary bypass surgery in 3.3%, non-valvular atrial fibrillation (AF) in 50.8%. According to echocardiography 18.3% of patients had myocardial scar after myocardial infarction, the 16.6% had decrease in left ventricular ejection fraction, 20.8% - left ventricular dilatation, 1.6% had aneurysm of the left ventricle, 74.1% - dilatation of the left atrium, 6.6% had valve stenosis, 1.6% - congenital heart defects (defects, shunts), pulmonary hypertension was observed in 24.1%. According to ECG monitoring - 48.3% has AF and 1.6% - sick sinus syndrome.

Conclusions: The structure of heart disease in patients with CEI is predominantly hypertension and AF. Dilatation of the left atrium is a common finding by echocardiography in patients with CEI.
Prevalence of masked uncontrolled hypertension and burden of target organ damage in subjects with a first episode of ischemic stroke.

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Background and objective: Masked uncontrolled hypertension (MUCH) is associated with unfavourable outcomes. The aims of this study were to estimate the prevalence of MUCH in subjects with a first episode of ischemic stroke after one year of follow-up, and to assess the hypertension-mediated organ damage (HMOD) in comparison with ambulatory controlled hypertensive subjects.

Patients and methods: Seventy patients with a first episode of ischemic stroke were consecutively included. Office BP was measured after 5 minutes of rest using a validated semiautomatic device (OMRON HEM-907XL) and 24h Ambulatory BP monitoring (24h-ABPM) and pulse wave velocity (PWV) was measured by means of a Mobil-O-Graph PWV. HMOD damage burden was defined as the presence of a left ventricular mass index (LVMI) ≥ 115 g/m² in men or ≥ 95 g/m² in women, albuminuria ≥30 mg/g in a morning random sample or a PWV ≥ 10 m/s. MUCH was defined as an office BP < 140/90 mm Hg and a mean 24h-ABPM BP < 130/80 mm Hg.

Results: We analysed 59 patients, aged 65.4±14.0 years; 61% males, with available data on both office BP and 24h-ABPM after 12 months of follow-up. The control rate of office BP (< 140/90 mm Hg) and 24h-ABPM BP (< 130/80 mm Hg) was 84.7% and 67.8%, respectively. The prevalence of MUCH was 25.4% (15 patients), most of them (n=12) due to uncontrolled nocturnal BP (night-time BP > 120/70 mm Hg). Thirty-five patients (59.3%) had controlled BP both in the office and in 24h-ABPM. The burden of target organ damage was not statistically different between subjects with MUCH (73.3%) and subjects with controlled BP (62.9%, p=0.47). LVMI was 125.1±49.0 vs. 111.6±32.2 (p=0.36), and WPV was 9.5±1.6 vs. 8.6±1.9 (p=0.18).

Conclusion: The prevalence of MUCH in subjects with a first episode of ischemic stroke was high due to uncontrolled nocturnal BP.
P40F

Prevalence of major cardiovascular risk factors and coronary heart disease in a sample of Niger delta adults in Nigeria.

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Aim
In Nigeria coronary heart disease is prevalent among Niger delta adult population and there is urgent need to improve access to care for CHD among this region. As the purpose of our study was to assess and determine the current prevalence of self-reported risk factors and CHD in Niger delta adult population of Nigeria.

Background:
Comprehensive data regarding prevalence of coronary heart disease (CHD) and associated factors in different geographical regions are very important to our understanding of Nigerian distribution and evolution of CHD.

Methods:
A community-based cross-sectional study was re-conducted in May 2019, among residents of EDO municipality (Delta region). Data were collected from face-to-face interviews. The study sample included 5636 subjects (men, 49.5%; mean age, 50.5; range 20-95 years), with similar age and sex distribution to the target population.

Results:
The age-standardized prevalence rates of five major risk factors were as follows: type 2 diabetes 11.1%, hypercholesterolemia (cholesterol>240 mg/dl or using cholesterol-lowering medication) 23.8%, hypertension 27.2%, current smoking 38.9% and physical inactivity 43%. Of the participants, only 21% were free of any of these factors. Clustering of two to five risk factors was more frequent among persons aged 50 years and older as compared with younger ones (60% vs 27%, P=0.000). The age-adjusted prevalence of CHD was 6.3% (in men, 8.9%; in women, 3.8%) and that of myocardial infarction was 3.6% (in men, 5.2%; in women, 2.1%). According to multivariate analysis age, gender, education level, obesity, diabetes, hypercholesterolemia, hypertension and ever smoking were strongly associated with CHD.

Conclusion:
Classic risk factors are highly prevalent and frequently clustered, especially in adults aged 50 years and older. These findings raise concerns about future trends of already increased rates of CHD. Multifactorial and integrated population-based interventions need to be applied to reduce the burden of cardiovascular conditions.
P41F

The influence of a short-term physicians' training course on adherence to long-term statin therapy

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Background. Typically, atherosclerotic diseases have little or no symptoms before complications occur. It results in poor adherence to such therapy.

Material and methods. The study was multicenter prospective observational. 298 patients (pts) of high and very high cardiovascular risk were included in the study five regions of Russia. Before study initiation, a special short-term physicians' training course based on ESC guidelines was conducted. Patients were monitored for 12 weeks with 3 visits: inclusion (V0), 1 and 3 months after V0 (V1; V3). Initial treatment with statins at V0 and its changes at V1 and V3 were assessed. Low-density-lipoprotein cholesterol (LDL-C) level was registered at each visit. Special questionnaire was used at V1 and V3 to assess pts’ adherence to statin therapy.

Results. Initially, 112 (37.5%) of 298 pts did not take statins. At V0 statins were recommended to everybody. According to special questionnaire at V1 13 pts did not start prescribed statin therapy, 7 pts started therapy, but stopped it due to various reasons. At V3 another 25 pts stopped taking prescribed statins, however, 12 pts, who initially refused to take statin therapy, started it. Overall, 262 pts took statins from V0 to V3. The target LDL-C level was achieved at V0 only in 11 (3.7%) pts and at V3 in 121 (40.6%) pts.

Physicians appreciated LDL-C level as target in 16 (5.4%) pts at V0, in 67 (22.5%) pts at V1 and in 142 (47.7%) pts at V3. Dose titration was performed only in 56 pts at V1.

Conclusion. A special training course based on ESC guidelines, in general substantially improved physicians’ adherence to clinical guidelines. It also has a positive effect on patients’ adherence to treatment. However, a number of doctors, despite the educational course, misinterpreted target LDL-C levels and showed clinical inertia in dose titration.
**P42F**

**Relationship between left atrial dilatation and stroke**

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**Background**

Increased atrial size is frequent in ischemic stroke patients in clinical practice. Left atrial enlargement (LAE) as a risk factor for cerebral infarction is controversial. The aim of this study is to investigate the association, at the time of acute ischemic stroke, between indexed left atrial volume (LAVi) and stroke subtypes.

**Material and methods**

There were 102 patients admitted at our Stroke Unit from 02/2013 to 09/2014, identified as suffering from ischemic stroke. Stroke subtype was determined per the TOAST classification. Categorical variables were compared with the use of Fisher’s exact test or the chi-square test, as appropriate.

**Results**

A study population consisted of 102 patients. The mean age of this population was 65.2±14.2 years old, 83 (48.8%) were male. About the risk factors for heart disease and other cardiovascular disease, most of the patients had high blood pressure (54, 52.9%), followed by dyslipidaemia (35, 34.3%), diabetes (19, 18.6%) and smoking (13, 12.7%). Patients with increased LAVI tend to have more stroke risk factors than patients with normal LAVI. Patients were distributed into two groups as those with or without LAD. Of 102 patients, 57 (55.8%) had LAD; mean LAVI 48.32±14.81 ml/m². Patients with normal LAVI were 45 (47.4%); mean LAVI 25.99±5.21 ml/m². According to TOAST classification, large-artery atherosclerosis (n=10), cardioembolic infarcts (n=24), lacunary infarcts (n=8) and LAD of undetermined origin (n=57) were identified. The risk of cardioembolic stroke increased with LAVI of 34 ml/m² and above, namely, 21 patients had increased LAVI while only 3 patients had normal LAVI, whose mean LAVI was 54.01±18.67 ml/m². Hence the observation was that the risk of cardioembolic stroke increased with increasing left atrial volume indices.

**Conclusions**

LAE influenced most patients in all subtypes of ischemic stroke. Increased LAVI might be a risk factor of cerebral infarction, especially in patients with cardioembolic stroke subtype.
P43F

Bleeding events associated with poor warfarin control: An observational study of patients prescribed warfarin for non-valvular atrial fibrillation in the Welsh population.

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Background: In patients with non-valvular atrial fibrillation (NVAF) prescribed warfarin, the association between ‘poor’ INR control [as defined by European Society of Cardiology (ESC) or the National Institute for Health and Care Excellence (NICE)] and bleeding outcomes has not been fully characterised. This study set out to (i) quantify bleeding rates, and (ii) evaluate associations between bleeding, comorbidities and poor INR control (ESC and NICE criteria).

Method: Linked anonymised patient-level data for Wales (2006-17) were used to evaluate individual patients’ INR control. Poor INR control is defined by ESC as a patient’s TTR <70%; and by NICE as one of i) TTR < 65%, ii) two INR values > 5 or one INR value > 8 within 6 months, iii) 2 INR values < 1.5 within 6 months. Bleeding rates were calculated during periods of individual ‘adequate’ and ‘poor’ INR control. Associations between periods of ‘poor’ INR control and clinical characteristics with bleeding events were estimated using Cox multiple regression.

Results: 35,036 patients were included, mean: follow-up=4.3 years, TTR=72.2%, age=73.7 years and CHA2DS2-VASc score=3.5. 5,809 bleeding events occurred in 5,302 patients, most commonly gastrointestinal n=2,224 (38.3%), urinary, n=1,492 (25.7%) and intracranial, n=601 (10.3%). The bleeding event rates (per 100 patient-years) were 3.46 and 3.57 for periods of adequate INR control according to ESC and NICE criteria respectively, rising to 5.02 and 5.11 during periods of poor INR control.

In multivariable models, poor INR control according to both ESC and NICE criteria was independently associated with bleeding events (HR=1.45, 95%CI(1.37-1.53), p<0.001] and HR=1.43, (1.31-1.51), <0.001 respectively), as were increasing age, prior bleeding events, ischaemic heart disease, strokes, and chronic kidney disease.

Conclusions: Periods of poor INR control are associated with significantly higher bleeding event rates, independently of common comorbidities that are recognised as risk factors for stroke and bleeding.
P44F

Impact of gender on left atrial structure and function in patients with recurrent atrial fibrillation

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Background: The risk of stroke imposed by AF is significantly greater in women. The origin of these differences may lie in a sex-specific variability of the left atrial remodeling, however, the data concerning this is scarce.

Purpose: To assess the impact of gender on left atrial structure and function in patients with recurrent atrial fibrillation and hypertension.

Methods: 30 men and 37 women (median age of 65) with recurrent AF and were enrolled in the study. Conventional echocardiographic measures and extended LA measures, including its volume in three phases: minimal volume (Lamin), presystolic volume (LApP), maximal volume (LAmax); LA emptying fraction (LAEF), LA expansion index (LAEI), passive and active LA ejection fraction (LAEFp and LAEFA) were performed.

Results: Despite similar LAmax volume index (LAmaxVI) (36.6 vs 36.1 ml/m2; p=0.86), women had worse LAEF (50 vs 39%; p=0.02) and LAEI (98 vs 64%; p=0.02). LAEFP was higher in men (33 vs 12%, in men and women, respectively; p<0.001), whereas LAEFA – in women (24 vs 31%, in men and women, respectively; p=0.04). In vast majority of women (33) active LA emptying volume exceeded passive, while in men only 2 had similar pattern (p<0.001). 30% of men had normal structure (LAmaxVI ≤ 34 ml/m2) and normal function (LAEF ≥ 45%) of the LA, 33% - impaired structure and impaired function, 34% impaired structure and normal function and 3% normal structure with impaired function, whereas proportions of women in the same categories were 16%, 35%, 30% and 19%, respectively (p=0.19).

Conclusion: Men and women with recurrent AF and hypertension had similar LA echocardiography conventional measures. However, women had worse LAEF and LAEI. In women as distinct from men LV filling was predominantly due to LA systole. Worse LA function in women may be a reason for the higher stroke risk among them.
P45F

PRediction and detection of Occult Atrial fibrillation in patients after acute Cryptogenic stroke and Transient Ischemic Attack (PROACTIA)

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Background
Studies with implantable cardiac rhythm monitors (ICRM), have shown that a large proportion of patients with cryptogenic stroke/TIA have occult episodes of atrial fibrillation (AF). However, ICRM are costly and resource demanding. PROACTIA seeks to build a novel composite scoring system to assess individual risk of occult AF in order to offer tailored therapy. Here we present baseline characteristics, feasibility and initial results.

Materials and Methods
Patients admitted with first time cryptogenic stroke or TIA were eligible for the study and underwent registration of medical history, blood sampling, cerebral CT/MRI, carotid Doppler ultrasound, ECG, 24h-Oxy-HolterECG, transthoracic and transesophageal echocardiography, and implantation of ICRM during the index hospitalization.

Results
During the 25 months study period >1800 patients were admitted for first time stroke or TIA. 170 (12%) of strokes were hemorrhagic. Eligible patients (n=434) were screened for the study with 24h-Oxy-Holter ECG and 251 patients were included and implanted with an ICRM. Eleven patients were later excluded, yielding a study cohort of 176 patients with cerebral infarction and 61 with TIA that were followed for 833 (633-1028) days. Data given as median (IQR). Baseline characteristics: age: 71 (61-78) years, 62% male, CHADS-VASC: 4 (3-5), 63% hypertension, 17% vascular disease, 13% diabetes, 3,4% heart failure, 2,5% venous thromboembolism, 12% current smoker. AF was detected in 35.4 % with 113 (25-336) days to detection, and 5 (2-14) days from AF-detection to initiation of NOAC. One patient experienced an early wound infection requiring removal of the ICRM. There were no other complications related to the study procedures. Twelve patients (5,1%) had a recurrent stroke, and seven (3,0%) recurrent TIA.

Conclusion
PROACTIA confirms that ICRM with home-monitoring capabilities is a feasible, safe and highly effective way to detect occult AF and initiate adequate secondary prophylaxis in a timely fashion in patients with cryptogenic stroke/TIA.
Cardioembolic stroke: a potential complication of a transesophageal echocardiography

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Transesophageal echocardiography (TEE) is generally safe diagnostic procedure; complications are rare and mostly limited to probe insertion and injury of upper gastrointestinal tract. In literature, there are only few reports of cardiovascular complications.

We report a 69-year old female patient, former smoker, with history of arterial hypertension and ischemic heart disease. She has been admitted due to distal radius fracture. De-novo atrial fibrillation was detected and therapeutic low-molecular-weight heparin was initiated. Transthoracic echocardiography (TTE) showed a tumorous pedunculate formation originating from intra-atrial septum of the left atrium. In view of its position and appearance, myxoma was suspected. For a detailed identification of the formation, TEE was performed. Probe insertion and manipulation throughout TEE was uneventful. We confirmed myxoma-like formation with very thin attachment to intraatrial septum of the left atrium, and additionally observed a thrombus in the left atrial appendage (LAA). About fifteen minutes after the examination, the patient developed a stroke-like clinical presentation with global aphasia and left sided hemiparesis. No contraindications for thrombolysis were present thus alteplase 100 mg i.v. over 2 hours was started. During thrombolysis, a control TTE was performed and there was no myxoma-like formation in the left atrium. After thrombolytic therapy, neurological deficits resolved completely. One week after the event, control TEE confirmed that the left atrium was free of any mass except thrombus in the LAA. She was started on oral anticoagulant treatment with warfarine and was without additional neurological events during 6 months of follow-up. After 6 months, TEE demonstrated a complete resolution of LAA thrombus.

Although cardioembolic stroke during or shortly after TEE is extremely unlikely, we report a case where this scenario is most probable: anatomic characteristics and thin stalk, combined with the stress of the TEE, most likely contributed to thrombus mobilisation and stroke.
Stroke prevention in cancer patients with atrial fibrillation: taking a fresh look

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1. Patient presentation
We present a case study of a 72-years-old-female with history of symptomatic paroxysmal atrial fibrillation for 3 years (Modified EHRA score = 3), concomitant hypertension, heart failure and dyslipidemia, BMI = 35.2. Medication included propaphenon 300 mg, apixaban 10 mg (CHA2DS2-VASc score =4), metoprolol 50 mg, torasemide 5 mg, ramipril 5 mg and atorvastatin 20mg. She was referred for catheter treatment of AFib. After 4 months of follow up the patient underwent endoscopy due to chronic Hb lowering and was diagnosed colorectal cancer.

2. Initial work up
On admission she presented irregular tachycardia, respiratory rate 18-20 pm, blood pressure 125/80 mm Hg, heart rate 112 bpm. In ED blood tests revealed elevated triglycerides with normal brain natriuretic peptide, D-dimer and cardiac troponin level. Hb level was 95 g/l. ECG showed atrial fibrillation.

3. Diagnosis and Management
The biopsy during colonoscopy revealed active stage of cancer. After successful laparoscopic cancer surgery, CT scan of the chest, abdomen and pelvis and MRI scan of the pelvis didn’t reveal tumour progression. Thus anticoagulation was restarted in early postoperative period after surgery. Despite antiarrhythmic medication AFib was highly symptomatic, transformed into persistent form and contributed to moderate heart failure. The patient didn’t receive chemotherapy or other potentially cardiotoxic drugs. Propaphenon 300 mg was changed to amiodaron 400 mg with lowering dose to 200 mg/daily. According to ECHO data LV end-diastolic volume was 290 ml, LV EF was 48% (in the setting of tachycardia). Catheter ablation of symptomatic persistent Afib was performed in 9 months after cancer surgery.

4. Conclusion(s)
The problem is which anticoagulant is preferable in patients with atrial fibrillation and concomitant colorectal cancer considering potential bleeding risk. NOACs seem to be associated with better adherence and safety profile in patients with AFib and cancer if there are no contraindications.
P48F

Falls and its Influence on Oral Anticoagulation Usage in Older Adults: Findings from the Prospective SAGE-AF Study

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Background: It is widely believed that falls adversely influence oral anticoagulant (OAC) prescription patterns. Older adults with atrial fibrillation (AF) and elevated thromboembolic stroke risk often do not get OAC due to their actual or presumed fall risk. However, a systematic evaluation of falls in this high-risk population, associated risk factors and influence of falls on OAC usage in real-world practice is lacking.

Methods: We analyzed data from the prospective Systematic Assessment of Geriatric Elements in AF (SAGE-AF) study, which includes adults aged 65 years and older with non-valvular AF who are anticoagulation eligible. Self-reported falls over a 1-year follow-up period were ascertained and related to clinical, geriatric, and psychosocial conditions assessed at baseline. Fall rates were further stratified by their corresponding stroke risk; changes in OAC usage in those with and without falls were also evaluated.

Results: A total of 1244 participants were enrolled in the study and 941 completed a 1 year follow up examination to date. The mean age of study participants was 75.4 years, 50.7% were women and 84.9%, were prescribed an OAC. Approximately 30% of study patients reported having fallen at least once over the follow-up period. Fall risk increased linearly with their corresponding stroke risk (Figure1). Higher CHA2DS2VASc score, frailty, depression and prior history of falls were associated with higher risk for falling after multivariate analysis. OAC prescription patterns (continuation, switching between NOAC/warfarin or discontinuation) did not differ by their fall risk (Figure2).

Conclusions: The prevalence of self-reported falls in this large cohort of older adults with AF was high, with several associated risk factors including elevated stroke risk, depression, frailty and prior history of falls. A substantial proportion were appropriately on OAC at baseline and remained on OAC at 1 year follow up, despite high rates of falls observed during this period.
P49F

Cryptogenic stroke and hidden atrial fibrillation: role of left atrial function and prolonged monitoring with insertable cardiac monitor

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Background: Cryptogenic stroke (CS) is associated with high rate of recurrences and adverse outcomes at long-term follow-up, especially because of the unknown etiology that often leads to ineffective secondary prevention. In such scenario, asymptomatic misdiagnosed atrial fibrillation (AF) episodes could play an important pathophysiological role. The aim of this study was to identify prevalence, clinical and echocardiographic predictors of AF in patients with CS, with a focus on atrial morphological and functional parameters.

Material and Methods: This is a single-center prospective cohort study. We enrolled 70 patients with CS according to TOAST’s criteria, of which 55 underwent transthoracic echocardiography focused on left atrial size and function. All the patients underwent implantable loop recorder (ILR) and all detected AF episodes ≥30 seconds were considered.

Results: ILR revealed AF in 23 patients (32.9%). Significant differences emerged between AF group and no AF group, such as age (p=0.014), CHA2DS2-VASc score (p=0.009), left ventricular ejection fraction (LVEF, p<0.001), left atrial end systolic area (LAESA, p<0.001), left atrial ejection fraction (p=0.016), left atrial total emptying fraction (LATEF, p=0.0025), left atrial end systolic volume index (LAESVi, p=0.004), pulmonary venous atrial reversal wave duration (p=0.011), E/e' lateral (p=0.009) and septal (p=0.02) tissue Doppler imaging, four-chamber (p=0.003) and two-chamber (p=0.007) view peak atrial longitudinal strain, suggesting worst atrial function in AF group. Furthermore, in multivariate logistic regression analysis, age (CI 95% 0.012-0.306, p=0.034), LAESA (CI 95% 0.099-1.147, p=0.02) and E peak velocity (CI 95% 0.016-0.242, p=0.025) emerged as independent predictors of AF.

Conclusions: AF episodes are documented by ILR in about one third of patients with CS. LAES area and E peak velocity are independent predictors of AF. Therefore, transthoracic echocardiography could provide incremental information for predicting AF over clinical characteristics.
P50F

Association between high-sensitivity cardiac troponin and risk of stroke in 96,702 individuals: a systematic review and meta-analysis

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Background and Purpose: Our study aim was to estimate risk of incident stroke based on levels of high-sensitivity cardiac troponin (hs-cTn), a specific biomarker indicating myocardial injury, in the general population, patients with atrial fibrillation, and patients with previous stroke.

Methods: Embase, PubMed, and Web of Science were searched until March 14th, 2019 to identify potentially relevant articles. Randomized controlled trials and cohort studies assessing the risk of incident stroke based on hs-cTn levels were eligible. Pooled adjusted hazard ratios including 95% confidence interval (CI) were calculated using a random-effects model due to study heterogeneity per population, per type of contrast, per hs-cTn type assay, for low risk of bias, and for all-cause and ischemic stroke separately.

Results: We included seventeen articles with 96,702 participants. In studies conducted in the general population (n=12; 77,780 participants), the pooled adjusted hazard ratio for incident stroke was 1.2 (CI: 1.1-1.4) for high versus low hs-cTn during an average follow-up of 1.3-20 years (median 10). When only categorical data were combined, this was increased to 1.6 (CI: 1.3-1.9). The results were robust when accounting for misclassification of stroke (all-cause stroke/ischemic stroke), hs-cTn type (I or T), risk of bias, and type of contrast (categorical/continuous data). In patients with atrial fibrillation (4 studies, 18,725 participants), the pooled adjusted hazard ratio for incident stroke was 2.0 (CI: 1.3-2.6) for high versus low hs-cTn. The calculated odds ratio for incident recurrent stroke in one included study with 197 patients with previous stroke was 3.17 (CI: 0.83-12.07) for high versus low hs-cTn.

Conclusions: This meta-analysis suggests that hs-cTn can be regarded as a risk marker for incident stroke, with different effect size in different subgroups. More research about the association between hs-cTn and incident stroke in high-risk populations is needed, especially in patients with history of ischemic stroke.
Prevalence, major cardiac causes of cardio-embolic stroke and in hospital mortality in eastern part of Nepal

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Background: Cardio-embolism accounts for 15-30% of all ischemic stroke. The study aims to assess conventional and major cardiac causes of cardio-embolic stroke, its prevalence, lesions associated with type of weakness and in-hospital mortality.

Methods: Patients with cardio-embolic stroke over a period of one year were included. The demographic and laboratory data was analysed using analysis of variance (ANOVA), and the Bonferroni correction was applied in the post-hoc analyses. Groups were compared using chi square test and student t-test. P value less than 0.05 was considered statistically significant.

Result: In 384 patients with ischemic stroke, 168 (44%) had cardio-embolic stroke. Among these patients, 56% were male and 44% female with mean age of 69±1 years. Dyslipidaemia (72%), hypertension (69%), smoking (34%) and diabetes (33%) were the most common risk factors for cardio-embolic stroke. Atrial fibrillation (AF) (71%) is the most common specific cardiac causes for cardio-embolic stroke. Patients with AF had higher in-hospital mortality compared to sinus rhythm (p=0.003). Patients with ischemic cardiomyopathy, dilated cardiomyopathy and left ventricular Ejection fraction ≤50% had higher rate of mortality when compared to patients without the above corresponding diseases (P=≤0.011 for all). Patients who were on clopidogrel therapy in addition to warfarin / Aspirin had significantly lower mortality (p=0.011). Subjects with AF had higher incidence of left sided weakness when compared to sinus rhythm (p=0.049). Similarly, patient with ischemic cardiomyopathy had higher number of left sided hemiparesis when compared to cardio-embolic stroke patients without ischemic cardiomyopathy.

Conclusion: Hypertension and dyslipidaemia is the most common conventional, while AF is the most common cardiac cause of cardio-embolic stroke. Patients with AF and associated with structural cardiac disease were significant predictors of in-hospital mortality in patients with cardio-embolic stroke.
P52F

Assessment of the left atrial appendage morphoLogy in patients after ischemic stroke - The ASSAM Study

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Background: The ASSAM study was designed to evaluate the association between left atrial appendage (LAA) morphology and the risk of stroke in patients with atrial fibrillation (AF).

Material and methods: This prospective observational study included 85 randomly chosen AF/AFL patients with acute ischemic stroke matched with 84 AF/AFL patients without stroke. All patients had left atrial (LA) computed tomography performed to analyze LAA anatomy.

Results: In a univariate analysis, patients in the stroke group had a larger LAA volume (10.22 [7.83–13.62] vs. 9.33 cm³ [7.33–11.47], p = 0.046), greater distance from LAA ostium to the first LAA bend (9.25 ± 3.85 vs. 7.23 ± 2.95 mm, p = 0.0002), and more frequently showed round LAA ostium shape (11.8 vs. 1.2%, p = 0.005). According to a multivariate model, significant predictors of ischemic stroke were distance from LAA ostium to the first LAA bend (OR 1.202 [1.065–1.356], p = 0.003), round shape of LAA ostium (OR 16.813 [1.857–152.231], p = 0.012), surface area of LAA ostium (OR 0.612 [0.457–0.819], p = 0.009), and cactus LAA morphology (OR 2.739 [1.176–6.380], p = 0.016). After adjusting for CHA2DS2-VASc score, only the distance from LAA ostium to the first LAA bend remained a significant risk factor for stroke (OR 1.154 [1.014–1.314], p = 0.03).

Conclusions: The distance from LAA ostium to the first LAA bend is independently associated with an increased risk of ischemic stroke in patients with AF/AFL. This parameter may improves the performance of the CHA2DS2-VASc score.
The main factors associated with hospital mortality in patients with stroke within the hospital registry

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Aim. To determine the main factors associated with hospital mortality in patients with stroke.

Material and methods. Retrospective (hospital) part of the REGION-M registry was used. Patients hospitalized with documented stroke were included consequentially. Data about risk factors, previous cardiovascular and concomitant diseases were obtained from hospital charts. Factors registered in less than 80% of cases were not included in the analysis.

Results. 216(24.0%) out of 900 patients died in hospital, 684(76.0%) patients were discharged: 365(40.6%) – males, 535(59.4%) – females. Mean age was 70.6±14.0 years of age (females – 73.3±13.9 years of age, males – 66.5±13.2 years of age; р<0.001). Data about having a disability certificate, smoking, alcohol abuse, family medical history, education, dyslipidemia were obtained from less than 80% of patients, thus their prognostic role was not included in the study. Frequency of registration of analyzed factors was practically similar for died and survived patients. Out of the factors included in the logistic regression analysis (gender, age, previous arterial hypertension, ischemic heart disease (IHD), myocardial infarction occurred once, myocardial infarction occurred twice and more times, stroke, transient ischemic attack, atrial fibrillation (AF), chronic heart failure, valvular heart disease, thrombosis, glucose intolerance, diabetes mellitus (DM), anemia, obesity, oncological diseases, chronic kidney and lung diseases, massive hemorrhage) age factor (OR 1.041(1.024-1.057) р=0.0001), history of IHD (OR 2.017(1.328-3.064) р=0.001), AF (OR 1.489(1.023-2.166) р=0.038), DM (OR 1.722(1.156-2.564) р=0.007) and previous thrombosis (OR 3.114(1.323-7.325) р=0.009) demonstrated statistically significant influence on hospital mortality.

Conclusions. Out of all the included in the analysis factors those associated with hospital mortality were age, history of IHD, AF, DM, thrombosis. Assessment of association of hospital mortality with cardiovascular disease risk factors, family medical history, social status, having a disability certificate, education was impossible because information obtained was incomplete.
Cardiac Cephalgia: a Treatable Rare Headache

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Background: Since the original publication in 1997 no case had been reported in Estonia. This entity should be suspected in the case of any de novo headache beginning after the age of 50 in patients with vascular risk factors, in particular ischemic heart disease. The response to nitrates confirms the diagnosis. Similar to angina, cardiac cephalgia can occur at rest.

Methods: A 64-year-old woman with a history of hypertension, diabetes, hypercholesterolemia, and ischemic heart disease but no migraines, who was under insulin, aspirin, enalapril, furosemide, and rosuvastatin therapy, was seen for daily headaches on physical effort that interrupted nighttime sleep. The patient had a history of ischemic stroke in 1999 (without sequelae). The patient was admitted to the neurology department with pulsating headaches lasting from a few minutes to several hours, occurring 1 to 4 times a day, located in both temples and accompanied by nausea.

Results: On the third day, while in bed the patient reported a new episode of incapacitating headache accompanied by nausea, and a mild feeling of oppression in the middle chest. The patient had spontaneously observed that nitrates, which she was using for angina attacks, would cause the headaches to improve within a few minutes. The ECG showed anterior ST segment depression. Both the headache and the electrocardiographic abnormalities abated rapidly with sublingual nitrates.

Conclusion: Cardiac cephalgia has been put forward that cardiac cephalgia may be secondary to the local release in the heart muscle of chemical mediators capable of inducing remote pain, in this case headache.
P55F

What does Heart Beat Tell about Prognosis of Stroke?

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Background: Guidelines recommend maintaining the heart rate (HR) of acute stroke patients within physiological limits.

Methods: Demographical data, stroke risk factors, NIH stroke scale score, lesion size and location, and ECG parameters were prospectively assessed from January 2018 to May 2019 in 789 patients with ischemic stroke. Patients were continuously monitored for at least 24 hours on a East Tallinn Central Hospital stroke unit. Tachycardia (HR ≥120 bpm) and bradycardia (HR <45 bpm) and cardiac rhythm (sinus rhythm or atrial fibrillation) were documented.

Results: HR ≥120 bpm occurred in 198 patients (25%). Stroke severity (larger lesion size/higher NIHSS-score on admission), atrial fibrillation and HR on admission predicted its occurrence. HR <45 bpm occurred in 31 patients (4%) and was predicted by lower HR on admission. Neither HR ≥120 nor HR <45 bpm independently predicted poor outcome at three moths. Stroke location had no effect on the occurrence of HR violations. Clinical severity and age remained the only consistent predictors of poor outcome.

Conclusions: Significant tachycardia is frequent phenomena in acute stroke and bradycardia is infrequent phenomena in acute stroke; however they do not independently predict clinical course or outcome. Continuous monitoring allows detecting rhythm disturbances in stroke patients and allows deciding whether urgent medical treatment is necessary.
P56F

Asymptomatic Carotid Stenosis and Concomitant Silent Brain Infarctions

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Background: This prospective analysis aim was to clarify the prevalence of patients with asymptomatic carotid stenosis and silent brain infarction (SBI) based on MRI assessment.

Methods: We identified patients with unilateral extracranial ICA stenosis ≥70% on angiography or cervical ultrasound by standard Imaging criteria. We included patients with recent brain magnetic resonance imaging who had no previous history of stroke or transient ischemic attack. Radiologist ascertained the presence of anterior circulation SBIs. SBI was defined as either a lacunar infarction in the white or deep gray matter or cortical infarction defined by T2 hyperintense signal in cortical gray matter. The Wilcoxon signed-rank test was used to compare SBI in the cerebral hemispheres.

Results: The prevalence of SBI in asymptomatic carotid patients was 39%. Among 34 patients, we found a higher prevalence of SBIs ipsilateral to ICA disease (53%) compared with the contralateral side (20.8%; P=0.0067). There was no significant difference in the prevalence of lacunar SBIs (including both white and deep gray matter) between hemispheres (P=0.109), but there was a significantly higher prevalence of cortical SBIs occurring downstream from ICA disease (P=0.0045).

Conclusion: Our one center analysis emphasizes the need to standardize the definition and diagnostic criteria of SBI on MRI. Patients with asymptomatic ICA disease demonstrate a higher prevalence of SBI downstream from their ICA atherosclerotic disease compared with the contralateral side but only of the cortical and not lacunar SBI subtype.
P57F

Genetic factors for the development of complications after percutaneous coronary intervention

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Background. Today, every 10th patient after CV during the period of receiving DAT and during the next two years develops bleeding, with up to 4% of bleeding developing during the first hospitalization. According to foreign authors, over the past 10 years, the risk of intrahospital bleeding in such patients has increased 1.8 times. In this regard, the urgent issue is the search for new markers of early diagnosis of bleeding while taking dual antiplatelet therapy. Numerous studies have made it clear that the CYP2C19 * 17 variant determines the accelerated exchange of enzyme substrates, including clopidogrel. In patients, in this case, an increased risk of bleeding is possible, especially in homozygotes for this allele.

Materials and methods. A research design was developed. Study design - case-control. The study included 73 patients with coronary heart disease who underwent a procedure of percutaneous coronary intervention, who were divided into 2 groups: 34 (47.2%) patients - the main, 39 (54.1%) - control. In the main group there were patients with bleeding on the background of double antiplatelet therapy. The control group consisted of patients with a verified diagnosis of coronary heart disease who underwent percutaneous coronary intervention without bleeding. The results of the risk factors existence are presented as an odds ratio (OR) and their 95% confidence interval (CI).

Results and conclusions. According to a study of the CYP2C19 * 17 C / T gene (polymorphism) was detected in 9% of patients with double antiplatelet therapy. When analyzing genotypes in the first and second groups, there was no statistically significant difference in genotypes of the 17 CYP2C19 allele. For all the studied polymorphisms, OR = 0.658, a 95% confidence interval [0.145-2.984] were obtained, which indicates the absence of association of polymorphism of the CYP2C19 * 17 gene with a risk of bleeding.
The incidence of stroke and clinical characteristics of cohort patients with coronary artery disease who were subjected to coronary angiography

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Background: Atherosclerosis is sharing common pathogenesis and common risk factors at different territories. Whether atherosclerosis in different territories is having some different characteristics, risk factors and do atherosclerosis in one territory (e.g stroke) may affect management in another territory (e.g coronary artery disease, CAD)? This questions still has no clear answer.

Patients and methods: We studied 9834 successive patients from the cath. Lab data who were subjected to coronary angiography with or without intervention in the period from 1-1-2019 till 31-10-2019 at National Heart Institute, Egypt. We checked incidence of stroke in this group and reviewed known clinical risk factors for atherosclerosis. Reviewing data entry for history and clinical examination. Risk factors were assessed by history or by drug therapy.

Results: Incidence of stroke were 56 patients in this group (0.005%). 48 patients of them were males (85%). According to clinical presentation, TIA was the major form of 26 patients (46%). Monoplegia was 2nd presentation 14 cases (25%). 9 cases were having complete hemiplegia (16%), 3 were having complete hemiplegia with aphasia (5%), other 4 cases with documented intracerebral hemorrhage without residual neurological deficit (7%). Risk factors by order of frequency, hypertension was the most prevalent risk factor 69%, the 2nd most prevalent risk factor was smoking 66%, hypercholesterolemia was in 49%, while DM was prevalent in only 36%.

Conclusion and discussion: Hypertension and smoking are the most prevalent risk factors in combined stroke and CAD patients in our study group. Whether this prevalence of stroke in CAD patients who have coronary angiography is representing true figures or selection bias (as most post stroke patients unlikely to offer coronary angiography if they presented with coronary symptoms), needs further confirmation.
P59F

Association of Carotid Artery Stenosis and Peri-operative Ischemic Stroke among Filipino Patients undergoing Coronary Artery Bypass Graft Surgery

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Background: The occurrence of ischemic stroke among patients undergoing coronary artery bypass grafting (CABG) poses a devastating burden to both patients and clinicians. There is unclear direct causal relationship between presence of significant carotid artery stenosis (CAS) and occurrence of perioperative stroke as previous studies have shown conflicting results.

Methods: This is a retrospective cohort study among adult Filipino patients who underwent carotid duplex scan (CDS) and non-urgent CABG from 2012-2018 at a tertiary hospital in the Philippines. Patients who had CEA within 7 days prior to CABG were excluded. Significant CAS was defined as >50\% stenosis. Outcome was 30-day perioperative stroke. Incidence, subtypes and distribution of stroke were determined. Non-parametric tests were used to determine the difference of means and frequencies between no/mild CAS and significant CAS. Odds ratio (95\% CI) from logistic regression was computed to determine association between risk factors and perioperative stroke using STATA 15.0.

Results: 278 patients who consecutively underwent CABG were screened with CDS for the presence of CAS. Mean age was 61.18±9.57, males(86.69\%) with HTN(76.98\%), DM(34.89\%) and dyslipidemia(24.46\%) as the commonest comorbidities. Twenty three(8.27\%) patients had significant CAS, 91.3\%(21/23) of whom were asymptomatic. Those with CAS had higher proportion of smokers(17.39\% vs.4.71\%, p=0.033). The groups were similar in age, sex, BMI, and co-morbidities. Incidence of perioperative ischemic stroke was 1.8\%(5/278). All five stroke patients did not have significant CAS. Four had anterior circulation stroke; one had posterior circulation stroke. Mechanisms were as follows: AF-related cardioembolism(n=2); large artery atherosclerosis(n=2); small-vessel occlusion(n=1). On multivariate analysis, we had insufficient evidence to demonstrate an association between CAS and risk factors and perioperative stroke.

Conclusion: Prevalence of significant CAS among those undergoing CABG is low, none of whom resulted to perioperative ischemic stroke. Given the varied etiologies of stroke in our cohort of patients, our results suggest that perioperative stroke in CABG is multi-factorial.
P61F

Thromboembolic and hemorrhagic complications of atrial fibrillation cryoballoon ablation on different anticoagulation strategies: results from a national prospective registry

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Background: Pulmonary vein (PV) isolation has become a standard treatment for patients with atrial fibrillation (AF). Although there are certain differences in safety profiles of radiofrequency (RF) ablation and cryoballoon ablation (CBA) for AF, pivotal trials on periprocedural anticoagulation strategies have implemented point-by-point RF ablation mainly. Data on anticoagulation strategies and their safety in patients with CBA is lacking.

Purpose: To analyze the current anticoagulation approaches in patients undergoing CBA, the incidence and types of hemorrhagic and thromboembolic periprocedural events. The analysis was performed on data from the National cryoballoon AF ablation registry (NCT03040037).

Methods: Nineteen centers prospectively entered data into a web-based platform. Among 930 included patients full data on AC therapy was available in 719 subjects (mean age 59.2±9.3 years; 44.9% males).

Results: The mean CHADs2VASc score was 2.0±1.4; mean BMI 29.5±4.8; mean GFR 92±28.9 ml/min. Periprocedurally 574 (79.8%) subjects received direct oral anticoagulants (DOACs), 113 (15.7%) anti-vitamin K drugs (mainly warfarin); 16 (2%) patients received antiplatelet therapy. Uninterrupted warfarin therapy was used in 36 (2%) patients, uninterrupted DOAC therapy – in 251 (34.9%). Bridging therapy was used in 325 (45.2%) patients. The total number of major procedure-related complication was 25 (3.5%). Hemopericardium developed in 5 patients: 3 on uninterrupted rivaroxaban, 1 – rivaroxaban with bridging, 1 – interrupted apixaban. There were 18 (2.5%) groin vascular complications, and 1 – hemoptysis. Transient ischemic attack (TIA) developed in 1 female patient on rivaroxaban with bridging. Three patients died within 30 days following CBA from non-cardiovascular causes. There were no statistically significant differences in complications between patients receiving different periprocedural anticoagulation.

Conclusions: In the real life, about 45% of patients referred for CBA still receive bridging therapy in the periprocedural period. Despite this fact, there is no significant difference in complication rates between CBA patients with different anticoagulation approaches.
P62F

Evaluation of silent cerebral infarction prognosis in patients with carotid artery disease undergoing carotid artery revascularization procedure.

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INTRODUCTION: Patients undergoing Carotid Artery Angioplasty and Stenting (CAS) have high risk of stroke or transient ischemic attack (TIA) intra-procedurally. Even though ischemic brain lesions are detected on post-procedural imaging, most of these patients do not have neurological deficits (Silent Cerebral Infarctions-SCI). These ischemic lesions are correlated with long-term cognitive impairment. The association of intra-procedural ischemic lesions with prediction of cognitive impairment remains unclear.

AIM: The aim of this study is to assess the association of CAS with the perioperative development of new SCIs and the long-term prognosis, as well as the relationship between new ischemic brain lesions in Magnetic Resonance Imaging (MRI) and the degree of cognitive impairment.

METHODS: We present preliminary results of an ongoing prospective cohort study enrolling patients aged>18 years old who undergo CAS procedure. Neurological clinical examination was performed, and Mini-Mental-State-Examination (MMSE) and National-Institute-of-Health-Stroke-Scale (NIHSS) questionnaires were completed pre-, post-operatively, and at follow-up visit. Cerebral Diffusion-Weighted-MRI examination was performed pre- and post-procedurally.

RESULTS: Thirty-one patients were enrolled in this study. Mean age was 67.8±10.9 years, and male:female ratio was 24:7. All patients completed the CAS procedure successfully. Median follow-up period was 287 days. No death was reported within the follow-up period. Eight (25.8%) patients developed new ischemic lesions in post-procedural MRI. The MMSE score at follow up (24.7±5) was significantly decreased compared both to the pre-procedural (27.2±2.7; p=0.049) and to the post-procedural value (28.3±1.53; p=0.029). The NIHSS score, used to quantify stroke severity in clinically evident strokes, did not show, as expected, significant difference compared.

CONCLUSION: This study assesses the association of perioperative SCI development with long-term prognosis and cognitive impairment. Patients with new SCIs showed a worsening of cognitive impairment, whereas patients without, remained stable. The MMSE score correlates with MRI imaging and can be used in this setting to assess prognosis.
P63F

Endovascular thrombectomy beyond 6 hours in acute ischemic stroke with proximal anterior vessel occlusion: real-life experience in a tertiary hospital

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BACKGROUND: The efficacy of mechanical thrombectomy (MT) in carotid vascular territory beyond 6 hours after the onset of ischemic stroke was established in 2018 with two major clinical trials in 2018. Uncertainties remain about MT beyond that window of time.

METHODS: We conducted a retrospective review from a prospective record in our comprehensive stroke center. Patients who underwent MT beyond 6 hours in acute ischaemic stroke with large vessel occlusion in the carotid territory between November 2016 and April 2019 were identified. Baseline characteristics, treatments and outcomes were investigated.

RESULTS: Data of 59 patients were recorded (56% women), median age 71 (58.5-76). 31 patients did not fulfilled inclusion criteria for DAWN trial, 25 patients neither for DEFUSE-III trial. A total of 56% of patients were detected upon awakening and 58% were transferred from another hospital. The median baseline NIHSS was 16 (11-20). The median ASPECTS in cranial noncontrast CT was 8 (7-9) and 95% of patients had >50% of salvageable tissue. The median mismatch in perfusion TC was 70% (50-80%). A total of 49 patients (83%) had a middle-cerebral-artery occlusion and 17 patients (17%) presented a distal internal-carotid-artery occlusion. A total of 16 patients (27%) had previously been treated with intravenous alteplase at standard dose when properly. Successful recanalization was accomplished in 86%, 5 of them beyond 24 hours. The 90-day rate of functional independence was 66%. A higher proportion of patients with mRS>2 at 90 days were older (p=0.029), presented less atrial fibrillation (p=0.007), higher baseline NIHSS (p=0.0069) and at discharge (p<0.0001), and higher puncture-recanalization time (p=0.0085).

CONCLUSION: In our experience, MT beyond 6 hours associated good 90-day disability outcomes in well-selected patients. Extended time window beyond 24 hours deserves to be studied. Atrial fibrillation, older age, baseline NIHSS, and longer groin-puncture time were the most important prognostic factors.
P64F

Prevention of hemorrhagic and thrombotic complications in training patients with prosthetic heart valves

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Background. We aimed to estimate the efficiency of the training program for the patients with prosthetic heart valves in reducing the incidence of hemorrhagic and thrombotic complications within two years of observation.

Material and methods. The main group included 118 patients who completed the training program, the control group included 105 patients who didn’t participate in the school. The comparison groups were comparable not participating in the school. Comparison groups were comparable in age, gender, the place of residence, as well as the type of prosthesis and the underlying disease that caused the valvular heart disease. Patients were not statistically significantly different in the severity of heart failure and the presence of atrial fibrillation.

Results. Within two years after the training, 4 (3.4%) cases of acute cerebrovascular accident and 2 (1.7%) cases of transient ischemic attack were registered in the main group. In the control group without training, the acute cerebrovascular accident was detected in 9 (8.6%) patients. Thrombosis of the prosthetic heart valve in the mitral position, requiring repeated surgical intervention, was diagnosed in 2 (1.8%) patients not participating in the training. To calculate the linearized rates of the incidence of thrombotic and hemorrhagic complications, we took into account the scope of observation, which was 219.0 patient-years in the main group and 220.5 patient-years in the control group. In patients underwent the training program, the thromboembolic complications amounted to 2.73%/patient-years, in the control group, this rate was significantly higher – 4.9%/patient-years (p = 0.0400). Linearized bleeding rates were 2.73 and 7.2%/patient-years in the main and control groups, respectively (p = 0.0020).

Conclusion. The training program for patients with prosthetic heart valves is effective in reducing the thrombotic and hemorrhagic complications. During the training, a 1.8-fold decrease in linearized risk indicators for thromboembolism and a 2.6-fold decrease in bleeding were found.
Rivaroxaban versus Warfarin in Patients with Mechanical Heart Valve: a proof-of-concept study

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Background: Warfarin and similar vitamin K antagonists have been the standard therapy for patients with a mechanical heart valve (MHV), however the safety profile for this drug has been poor.

Purpose: The aim of the current study is to compare the incidence of thromboembolic events (stroke, systemic embolism, valvular thrombosis) and bleeding in MHV patients using Rivaroxaban versus Warfarin.

Methods: Prospectively, from September 2018 to September 2019 MHV patients was randomized in a 1:1 ratio to 15 mg Rivaroxaban twice daily or to use dose-adjusted Warfarin. All patients performed a CT brain scan and a transesophageal echocardiogram at the beginning and end of the study.

Results: We report a preliminary analysis with 30 patients – 15 was random allocated to Rivaroxaban and 15 patients for the Warfarin group. After 90 days of follow-up, embolic events for the central nervous system (including ischemic stroke and transient or asymptomatic events) occurred in 1 (6.7%) in the Rivaroxaban group and 2 (13.3%) in the Warfarin group (RR, 0.50[CI, 0.05 – 4.94]). Minor bleeding (without discontinuation of medical therapy) occurred in 4 (26.7%) in Rivaroxaban vs 6 (40.0%) in Warfarin group (RR, 0.67[CI, 0.23 – 1.89]). One patient in Warfarin group died from myocardial infarction. No cases of hemorrhagic stroke, valve thrombosis, peripheral embolic events or new intracardiac thrombus was related in both groups. Variations in the echocardiographic parameters as effective orifice area, mean and peak gradient, peak velocity and acceleration time also were numerically similar in both groups.

Conclusions: In a hypothesized scenario, rivaroxaban appears to be as safe as warfarin in patients with MHV. The preliminary data confirm the authors' proof of concept and strongly support the need for a prospective randomized trial. Trial registration NCT03566303.
P66F

Rheumatic Mitral Stenosis: Long-Term Follow-Up of Adult Patients with Non-Severe Initial Disease

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Background: There is no consensus regarding the natural history of rheumatic mitral stenosis (MS) among adults presenting with non-severe disease. This study aims to describe the progression of stenosis among adult rheumatic MS patients, to identify predictive factors for progression and to assess the incidence of complications.

Material and methods: A retrospective cohort analysis was performed among patients with rheumatic MS treated at a single center. 85 patients were included with mild to moderate MS, ≥30 years old on initial echocardiography. Demographics, medical history, echocardiographic reports over at least 10 years, and related complications were obtained from a computerized database.

Results: Over a period of 13.1 ± 2.38 years, 75 patients (88%) had no significant progression in stenosis severity. The final echocardiographic assessment demonstrated two groups with a significant difference between them regarding the mitral valve area (1.58 ± 0.44 cm² vs. 1.1 ± 0.26, p=0.001), and mean valvular pressure gradient (6.27 ± 2.52 mmHg vs. 8.5 ± 2.69, p=0.01). Patients with indolent MS (Group A) were compared to patients with progressive disease (Group B). We found no statistically significant difference in the incidence rate of major complications between the two subgroups: precisely 80% suffered from atrial fibrillation in both subgroups. As many as 26 out of 85 patients (30.6%) suffered cerebral ischemic events after the first echocardiographic assessment. Twelve patients (14.1%) experienced more than one event. The high rate of AF and stroke may be related to the rheumatic disease, however the high incidence of cardiovascular risk factors such as hypertension and diabetes could also contribute to this high complication rate.

Conclusions: An indolent natural progression of rheumatic mitral stenosis was observed in our study. Despite this finding, it still has potentially deleterious effects.
Adherence to Benzathine Penicillin G Prophylaxis and its Determinants among Patients with Rheumatic Heart Disease at Tikur Anbessa Specialized Hospital, Addis Ababa, Ethiopia

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Background: Benzathine Penicillin G [BPG] is the most effective method for secondary prophylaxis against acute rheumatic fever [ARF] whose efficacy largely depends on adherence to treatment.

Material and Methods: A cross-sectional study design which involved interviewing 145 patients receiving monthly BPG and reviewing their one year [April 10 to May 10, 2019] BPG prophylaxis injection four weekly was conducted at adult cardiac of TASH. Rate of adherence to BPG injection was determined by calculating percentage of actually administered drug from the total expected doses.

Results: Among a total of 145, majority of them [67.6%] diagnosed for rheumatic heart disease [RHD] and had been receiving BPG [76.6%] in the last 10 years. The adherence rate to monthly BPG injection was 82.30%. However, the minimum expectation for BPG secondary prophylaxis adherence rate [≥80%] was met by 101[69.7%] of participants. The study participants with informal education 1.10 [[0.023-46.96]] and higher level education status 0.89 [[0.10-8.11]] were more and less likely to adhere to BPG injection, respectively when compared with those who attended higher education program. Patients with no history of hospital admission (p=0.006) and those who admitted only once [p=0.007] in the last one year were significantly adhered to their drug when compared with those who admitted twice and above. The study participants who wait until the next appointment time on the action of missed/late doses of BPG were very less adhered 0.02 [[0.00-0.13]] [p=0000] to the BPG than those go a few days later for receiving the missed/late doses.

Conclusions: The adherence rate to monthly BPG injection was 82.30% in this study. Patients with no admission history to hospital and only one admission in the last one year were significantly adhered to their drug as compared with those who admitted twice and above.
P69F

A higher sensitivity to thrombi in dabigatran treated patients to intravenous thrombolysis? - findings from the Slovenian cohort study

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Background: Rapid inactivation of dabigatran by idarucizumab allows intravenous thrombolysis (IVT) in patients suffering acute ischemic stroke while being treated with dabigatran. We present the findings of the Slovenian cohort study.

Methods: Retrospective analysis of all stroke patients treated with idarucizumab and IVT (n=19) in the period from July 2016 to end of August 2019 from Slovenian region were analyzed.

Results: Indication for dabigatran treatment in all 19 cases was atrial fibrillation. Median NIHSS (National Institutes of Health Stroke Scale) at admission was 9, nine out of 19 patients were classified as severe ischemic stroke (NIHSS≥10). Therapeutic anticoagulation activity was present in 15 patients. The mean time from the start of neurological symptoms to the application of IVT was 144 minutes. The idarucizumab infusion was well tolerated in all patients. Sixteen out of 19 patients benefited significantly from IVT, 16 patients had mRS≤2 at discharge. In 16 patients anticoagulation therapy was restarted.

Conclusions: Our data show that IVT after idarucizumab application is effective and safe treatment of acute ischemic stroke patients on dabigatran. We recorded higher proportion of patients with favorable outcome compared to the randomized controlled studies which could suggest a higher sensitivity of thrombi to IVT in dabigatran treated patients.
Recanalization and stenting of total/subtotal carotid stenosis in symptomatic patients

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Background: Occlusion/near occlusion of the internal carotid arteries has long been a definitive contraindication for endovascular treatment. Recent small series have shown that endovascular recanalization and stenting of occluded/near occluded carotid arteries is feasible, but the data are still controversial. The aim of this research is to analyze the safety and feasibility of the stenting of occluded and nearly occluded carotid arteries in symptomatic patients.

Materials and methods: We present the results of stenting of the occluded and nearly occluded carotid arteries in 51 patients for the period 2012 – 2017. The two types of lesions – total occlusions (5) and near occlusions (46) – were analyzed together because of their identical hemodynamic and clinical presentation. All 51 patients had ipsilateral cerebrovascular ischemic event in the last 6 months. They represent 5.59% of the total 932 carotid stenting procedures in this period. Distal filter protection was used in all successfully recanalized cases. Vascular approach was femoral in 42 and radial in 9 patients.

Results: A successful recanalization and stenting was achieved in 50 cases (98%). The combined incidence of periprocedural stroke/death/MI was found in 3 cases (5.8%): one ipsilateral stroke (1.9%), one myocardial infarction (1.9%), one death (1.9%). The incidence of complications did not differ from the rest of patients with carotid stenting. No cases of specific severe complications - cervical hematoma, hyperperfusion syndrome, or intracranial hemorrhage were observed. The late 18-month-follow-up showed 1 stroke, 1 death (not related) and 1 in-stent restenosis.

Conclusion: The study confirms that carotid stenting is a feasible treatment method for functionally occluded carotid arteries. We found a high rate of technical success Despite of the anatomical complexity of these lesions, they can be treated with a risk no higher than the usual with favorable clinical result.
Rehabilitation after Stroke: Relationship between the Heart Rate Variability and Functional Outcome

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**Background**

Impaired autonomic nervous system regulation is frequently observed in patients with stroke. Previously, an association between an increased sympathetic activity and adverse functional outcome has been reported in post-stroke patients. The aim of the present study was to evaluate the impact of cardiac autonomic tone, assessed by the heart rate variability (HRV), on functional outcome of patients with stroke during the early post-stroke rehabilitation.

**Methods and results**

103 consecutive patients (67±11 y, BMI 27.1±5.4 kg/m², 64% males) with ischemic (84% of patients) and haemorrhagic stroke were prospectively studied. Depressed HRV, as a surrogate marker of increased sympathetic tone, defined by the standard deviation of NN intervals (SDNN) <100 ms and HRV triangular index (HRV-TI) ≤20, was assessed from a 24-h Holter electrocardiogram monitoring at admission to the rehabilitation (23±16 days after stroke). 23 patients (22%) were found with depressed HRV. No difference was found between patients with normal HRV and depressed HRV with regard to their functional (Barthel Index [BI], modified Rankin scale [mRS], and Rivermead Motor Assessment [RMA]) and biochemical status. However, after 4-week follow-up (FU) (49±18 days after stroke), significantly more patients with depressed HRV (70%) showed a cumulative functional disability (CFD), defined by the mRS≥4, BI≤70 and RMA≤5, in contrast to patients with normal HRV (35%, p=0.003). Furthermore, patients with depressed HRV showed worse functional status as assessed by BI (-16%, p<0.001), RMA (-12%, p<0.05) and (+16%, p<0.01) compared to patients with normal HRV. CFD was associated with depressed HRV [odds ratio (OR) 4.25, 95% CI 1.56 – 11.54, p<0.005] after adjustment for age, sex and body mass index (BMI) [OR 4.6, 95% CI 1.42 – 14.97, p<0.05].

**Conclusion**

Increased sympathetic nervous system activity in patients with stroke was associated with the worst functional outcome after the early post-stroke rehabilitation.
P73F

The impact of heart failure, atrial fibrillation and renal function comorbidity on outcome of rehabilitation after acute phase of stroke

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Background: An early and reliable prognosis of outcome after stroke is important for early stroke management and the optimal planning of post stroke care. The aim of this study was to evaluate the impact of heart failure (HF), atrial fibrillation (AF) and chronic kidney disease (CKD) on outcome of rehabilitation in stroke patients.

Methods: We enrolled 402 patients with ischemic stroke and 154 patients with hemorrhagic stroke, who are admitted in the rehabilitation center. Clinical characteristics of patients are obtained from medical records. The comorbidity of HF, AF and CKD were analyzed in association with outcome and incidence of medical complications during rehabilitation.

Results: HF (odds ratio, 2.58 [1.47–4.53]), CKD (odds ratio, 1.73 [1.06–2.83]) and their combination (odds ratio, 2.76 [1.28–5.94]) as well as the combination of HF and AF (odds ratio, 2.93 [1.57–5.45]) were associated with increased risk of unfavorable functional long-term outcome of rehabilitation (fatal and non-fatal adverse events), while the length of stay in rehabilitation center did not have any significant difference between these groups. The cumulative survival of stroke patients was adversely affected in patients with HF (hazard ratio 2.26, 95% CI 1.06–4.8, P = 0.028).

Discussion: The comorbid HF, CKD and the coexistence of HF-CKD and HF-AF are an independent predictor of unfavorable functional long-term outcome in stroke patients. These data suggest that comorbid HF is the only significant determinant of survival following rehabilitation after acute phase of stroke.
P75F

The experience of a stroke-physician-led Reveal LINQ Implantation service in a regional stroke unit.

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Background:
The usefulness of insertable cardiac monitors (ICMs) for detecting paroxysmal atrial fibrillation (PAF) in the setting of Embolic Stroke of Undetermined Source (ESUS) has been well documented, with a positive yield of 25-30% in large centres. However, an ICM service in a District General Hospital, using the Reveal LINQ device and led by a stroke physician trained in LINQ implanting, is not as well described.

Objective: To describe the experience of such a service and to assess its feasibility and performance compared to larger centres.

Material and Methods:
All ischaemic stroke cases from February 2017 to October 2019 attending St. Luke’s Hospital, Kilkenny, were initially assessed. Patients, who fulfilled criteria for ESUS, who were without level 2 ASCO criteria and who were between the ages of 55-80 years of age, were considered for Reveal LINQ implantation. The outcomes of this service are described.

Results:
During this time period, 255 ischaemic strokes presented to St. Luke’s Hospital. Of these, 19 cases were suitable for LINQ device implantation. Among these 19 cases, 5 cases of AF were detected (26%, +/- 20%), as well as one case of asymptomatic SVT and one case of second degree AV block requiring permanent pacemaker (PPM) insertion. In those in whom AF has been detected to date, a trend towards being older (69 vs 65 years of age) was observed, although this was not found to be statistically significant in this small sample (p = 0.46). Time to first episode was within three months in three of the five cases. There were no wound infections, no major complications and one minor complication.

Conclusion:
This analysis shows that an ICM service led by a stroke physician in a District Hospital is safe and feasible, and the data to date shows similar results as compared to larger centres.
P76F

**Differences in clinical characteristics of patients receiving Noacs vs vkas and effect on clinical outcomes**


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**Background**

Both vitamin K antagonists (VKAs) and novel oral anticoagulants (NOACs) are effective for the prevention of stroke in atrial fibrillation (AF). We aimed to assess differences in clinical characteristics, safety and efficacy of anticoagulation between patients receiving VKAs and NOACs, in a non randomized real world data.

**Material And Methods**

We studied a population of 965 consecutive patients who were hospitalized to the cardiology department with any diagnosis and coexisting AF. Binary logistic regression was used to explore differences in profile of those patients. Kaplan meier’s curves were used to illustrate the difference between NOACs and VKAs in a composite outcome of stroke events, major bleeding events and cardiovascular death during a 40 months follow up.

**Results**

642 (66.52%) patients were receiving NOACs and 323 (33.48%) were receiving VKAs (mean age 73.5 ± 10.8 years). Association was observed between VKA ‘s prescription and heart failure (OR:0.7 , 95% C.I:0.506-0.969 ,p=0.031), coronary artery disease (OR:0.52 ,95% C.I:0.361-0.748 ,p<0.001), mitral valve repair (OR:0.29 ,95% C.I:0.098-0.855, p=0.025), chronic kidney disease (OR:0.487 95% C.I:0.32-0.74 , p=0.001), rheumatic disease (OR:0.447 , 95% C.I:0.219-0.912 ,p=0.027), history of bleeding while under oral anticoagulation (OAC) (OR:0.589 ,95% C.I:0.414-0.837 , p=0.003), bundle branch block (OR:0.673 , 95%C.I:0.467-0.969 ,p=0.033), larger left atrium volume index (OR:0.984 ,95% C.I:0.971-0.997). NOACs prescription was associated with hypertension (OR: 1.592, 95% C.I:1.094-2.33, p=0.015). In total the composite outcome occurred in 253 patients (26.21%). Patients receiving VKAs had higher risk of experiencing the composite outcome compare with patients receiving NOACs (11.62% vs 14.87%, HR:2.5 95% C.I. 2.14-2.85 p<0.05).

**Conclusions**

Patients receiving VKAs at discharge have more comorbidities than patients receiving NOACs. The higher burden of comorbidities in a patient receiving VKAs may explain the higher probability of having the composite outcome compared with patients receiving NOACs.
Predictors of atrial fibrillation for prolonged monitoring in transient and minor stroke patients

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Introduction and purpose
Given the high rates of recurrence in Transient and minor stroke patients (TmIA) (NIHSS ≤ 5), they will be the most benefited patients of a successful study. Conventional stroke monitoring is 3 days duration, however guidelines recommend at least 1 month. Our aim was to determine AF prevalence in TmIA and to identify predictors of occult AF in this group of patients who received a prolonged monitoring between 3 days and 4 weeks after stroke.

Materials and methods
All patients with TmIA were selected from CRYPTO-AF database. CRYPTO-AF is a prospective multicentre registry of patients with cryptogenic stroke older than 55 years old. Monitoring started within the first 72 hours from stroke symptoms onset and was prolonged during 4 weeks. We gathered baseline data, clinical and neuroimaging pattern, cardiographic and blood test parameters. We compared the main variables to predict AF between patients with and without AF detection beyond 3 days.

Results
We included 152 patients, 55.9% were men, mean age 73.18 ± 10.24 and median NIHSS score was 2 (0-5). In 27 patients (25.7%) AF was detected during the first 4 weeks, of them 6 patients (22.2%) within the first 3 days and 21 patients (77.78%) between the 3rd day and the 4th week. Beyond 3 days, predictors related con AF detection were older age (p< 0.008), hemorrhagic transformation in the control CT or MRA (p< 0.001) and higher left atrial volume index (LAVI) (p< 0.000). In the multivariate analysis only LAVI more than 28.5ml/m² (OR 1.48, 95%CI: 1.0078-1.091, p< 0.022) independently predicted AF detection.

Discussion/conclusions
Patients with LAVI >28.5ml/m² should be intensively monitored to detect AF. More studies are needed to confirm our results.
P79F

Combined neurogenic pulmonary edema and atypical Takotsubo cardiomyopathy in patient with embolic stroke: the first case report.

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BACKGROUND. Neurogenic pulmonary edema (NPE) and Takotsubo cardiomyopathy (TCM) are rare complications of an acute ischemic stroke. They are considered due to an excess catecholamine release after sympathetic nervous stimulation following stroke onset. Among TCM apical ballooning is recognized as the typical form, but three atypical patterns have been described (midventricular, basal and focal ballooning) and resulted more frequent in patients with neurological disorders.

CASE DESCRIPTION. A 78 year old woman was treated with intravenous alteplase and underwent mechanical thrombectomy for an acute ischemic stroke. During the procedure her respiratory condition suddenly and rapidly worsened and she needed invasive ventilation because of a wide reduction of the FiO2/PaO2, (inspiratory oxygen fraction/arterial partial oxygen pressure). Chest X-ray revealed an infiltrative shadow on both lungs. Transthoracic echocardiography revealed moderate left ventricular systolic dysfunction with akinesis of the inferior and septal apical segments, extending beyond a single epicardial coronary distribution. Coronary angiography documented absence of obstructive lesions or evidence of acute plaque rupture. After 24 hours from NPE onset her respiratory function improved and she was finally discharged on day 7 without neurological deficits. Left ventricular systolic disfunction was reversible and ejection fraction normalized in 3 months.

CONCLUSIONS. It is a very rare case of simultaneously NPE and TCM following an acute ischemic stroke. Moreover it is peculiar because is the first observation of NPE and an atypical pattern of TCM, which is more frequent in patients with neurological disorders. A rapid recognition and treatment are essential for patient survival.
Prevalence and Outcome of Atrial fibrillation related Acute Stroke, the comparison with the non-atrial fibrillation group.

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Introduction
Atrial fibrillation is the most common rhythm disorder in the world and one of the three recognised risk factors to develop the stroke and it increases the risk to develop the stroke by fivefold. Atrial fibrillation related stroke will likely to have a severe outcome with high mortality and morbidity.

Methods
We have done a retrospective one-year study to find out how many of the total stroke patients admitted within the thrombolysis window were related to or caused by atrial fibrillation. How many of them had ECG on admission and whether the appropriate steps were taken to prevent further stroke (Anticoagulation). We investigated the total length of their stay, mortality and discharge destination.

Results
We analysed 223 patient’s data, admitted between September 2017 to August 2018. 42 (19%) patients were found to have atrial fibrillation on admission. The average length of stay for patients with atrial fibrillation was 18 days and 11 days for non-atrial fibrillation stroke, only 29 (69%) were discharged home as compared to 159 (88%) non-atrial fibrillation group. 4 (9.5%) were discharged to care home and only 8 (5%) in a non-atrial fibrillation group, 8 (19%) died in atrial fibrillation group as compared to 10 (5.5%) in non-atrial fibrillation group. 29 (69%) of the total atrial fibrillation related stroke were started on anticoagulation on discharge, 11 had a contraindication for anticoagulation and 2 had no clear explanation.

Discussion
As expected, our study has proved that atrial fibrillation related stroke has higher mortality and morbidity as compared to non-atrial fibrillation related strokes. We emphasise to follow the national/ESC guidelines and all the new AF patients should promptly be assessed for the risk of stroke, to prevent the development of the stroke in the future.
P81F

A case of cryptogenic stroke in a young man with left ventricular noncompaction and hypertrophic cardiomyopathy and hereditary thrombophilia.

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Background: left ventricular noncompaction (LVN, prevalence is 0.014-1.3%) and hypertrophic cardiomyopathy (HCM) are two rare diseases of myocardium. The event rate of stroke in patients with LVN is 1-2% per year. Hereditary thrombophilia (HTP) is one of the risk factors for proportion of ischemic stroke.

Case report. A 34-year-old non-smoker man was admitted to the hospital with gait unsteadiness, arms movement disorder and time feeling disturbance. At the age of 17 diagnosis of familial form of HCM was established (his father and sister also have HCM). The patient was treated only with beta-blocker. Magnetic resonance imaging (MRI) was performed and ischemic stroke in the right temporal and islet lobes was detected. 24-h Holter monitoring failed to prove any relevant arrhythmias. Thrombosis and valvular diseases were not revealed during transthoracic echocardiogram, ejection fraction (EF) dropped up to 42%. On cardiac MRI enlargement of the left chambers and non-ischemic myocardial fibrosis were found, EF was 35%. Signs of LVN and HCM were detected. Coronaroangiography showed intact coronary arteries. Patient underwent myocardial biopsy which revealed moderate muscle hypertrophy and subendocardial and interstitial fibrosis. In order to determine the cause of stroke in the young patient without atrial fibrillation genetic tests for HTP was done. Homozygous mutation of integrin-α2 gene and heterozygous mutations in coagulation factor XIII, fibrinogen beta-chain, plasminogen activator inhibitor-1, integrin beta-domain, methylenetetrahydrofolate reductase, methionine synthase reductase genes were detected. Enoxaparin 0,4 ml b.i.d. (was replaced by rivaroxaban 20 mg/day), acetylsalicylic acid 100 mg/day, folic acid apart from heart failure therapy (perindopril, eplerenone, torasemide, metoprololsuccinate) were initiated. 3 weeks after initial presentation, the full neurological recovery was achieved.

Conclusion: This clinical case demonstrates the necessity of detailed investigation of young patients with cryptogenic stroke in order to find rare hereditary disorders as the cause of thromboembol formation.
P84F

Heart Failure, Atrial Fibrillation and Acute Ischaemic Stroke Outcomes: A Nationwide Inpatient Sample Study

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Background – We aimed to describe the association between atrial fibrillation (AF), heart failure (HF) and acute ischaemic stroke (AIS) outcomes: in-hospital mortality, length of stay (LoS) greater than median and moderate-to-severe disability on discharge.

Material and Methods – AIS admissions from the Nationwide Inpatient Sample (NIS) between January 2004 and December 2014 were included. Logistic regressions were performed to analyse the relationship between AF/HF status (no AF & no HF-reference, AF only, HF only, AF & HF) and outcomes, stratifying for admission year and NIS stratum. Adjustments were performed for age, sex, hospital bed-size and location, 28 Elixhauser co-morbidities (excluding HF) and other confounding co-morbidities. Sensitivity analyses were performed including only patients receiving thrombolytic therapy.

Results – A sample representative of 4,225,908 patients was included. There were 69.4% of patients with neither AF nor HF, 16.5% with AF only, 7.5% with HF only and 6.6% with both AF and HF. 4.8% of patients underwent thrombolysis. AF (odds ratio 1.87 [99% CI 1.80-1.93], HF (1.77 [1.69-1.85]) and their combination (2.56 [2.45-2.68]) were associated with in-hospital mortality. Amongst patients receiving thrombolysis, AF (1.38 [1.24-1.55]), HF (1.36 [1.14-1.62]) and their combination (1.75 [1.50-2.04]) were associated with lower increases in the odds of in-hospital mortality. AF (1.68 [1.64-1.71], HF (1.54 [1.50-1.58]) and their combination (2.00 [1.95-2.06]) were associated with a LoS greater than median. Significantly higher associations between AF (2.03 [1.87-2.20]), HF (1.71 [1.52-1.92]), their combination (2.39 [2.13-2.69]) and prolonged LoS were recorded for patients receiving thrombolytic therapy. All 3 exposure groups were associated with higher discharge disability.

Conclusions – AF and HF increased the odds of in-hospital mortality by 80-90%, and their co-existence was synergistic. The association between AF, HF and post-AIS mortality was weaker amongst patients receiving thrombolysis. All 3 exposure groups were associated with prolonged hospitalisation, with stronger associations amongst patients receiving thrombolysis.
P85F

**Vitamin D status and carotid artery calcification**

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Background: Several reports have mentioned the role of vitamin D deficiency in the pathogenesis of coronary and carotid artery diseases. The aim of this study was to evaluate whether vitamin D status is associated with carotid artery calcification, serum phosphate and calcium or not.

Material and methods: A total of 121 patients with ischemic stroke who had undergone CT-angiography were recruited to the study. Serum vitamin D level was measured using HPLC method. Patients were categorized into three groups according to their vitamin D serum level: Vitamin D-deficient (< 20 ng/ml), vitamin D-insufficient (20-30 ng/ml), and vitamin D-sufficient (> 30 ng/ml).

Results: Vitamin D deficiency was observed in 30.5% of patients. No significant relationship was found between serum vitamin D level and carotid artery calcification, serum phosphate and calcium.

Conclusion: Although most of patients with carotid artery calcification were vitamin D-deficient but this research did not demonstrate a significant link between low vitamin D levels and calcification of carotid artery.
P01S

Understanding of and perceptions towards cardiovascular diseases and their risk factors: a qualitative study among residents of urban informal settings in Nigeria

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Aim: The study explored the understanding of and perception towards cardiovascular disease (CVD) and risk factors, and how they influence prevention and development of the conditions, care-seeking and adhering to treatment.

Setting: Informal settlements of Lagos Nigeria.

Methods: Nine focus group discussions consisting of between six and eight purposively sampled participants were conducted among healthy individuals aged 20 years or older. A total of 65 participants (41 female) were involved.

Results: Poverty, ignorance and illiteracy promoted behaviors like smoking, (harmful) alcohol consumption, physical inactivity and unhealthy diet, implicated in the development of obesity, diabetes and hypertension. Some respondents could not see the link between behavioral risk factors with diabetes, hypertension and stroke and heart attacks. Contaminated food items consumed by the residents and familial inheritance were factors that caused CVD, whereas emotional stress from constant worry was linked to hypertension, stroke and heart attacks. Few and inadequately equipped public health facilities were hindrances to treatment seeking and adherence to treatment for CVD conditions. Lack of medication in public health facilities was considered to be the single most important barrier to adherence to treatment next to lack of family support among older patients.

Conclusion: Interventions to prevent and manage CVD in low-resource and urban poor settings should consider perceptions and understanding of risk factors for CVD, and the interrelationships among them while accounting for cultural and contextual issues for example, stigma and disregard for conventional medicine. Programs should be informed by locally generated evidence on awareness and opportunities for CVD care, coupled with effective risk communication through healthcare providers. Screening for and treatment of CVD must address perceptions such as prohibitive cost of healthcare. Finally, social determinants of disease and health, mainly poverty and illiteracy, which are implicated in addressing CVD in low-resource settings, should be addressed
P02S

Prevent’Sroke study, a primary prevention program conducted through front-line professionnals using the NeuroCoach recorder in the general population.

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Background: Many subjects suffer a stroke each year. The objective is to evaluate the feasibility of a prevention program in three steps: screening, counseling and orientation.

Methods: We perform a feasibility study in the local area of Auvergne Rhone Alpes. We use a recorder able to identify three of the main predictors of stroke (Neurocoach): atrial fibrillation (AF), sleep apnea syndrome (SAS) and autonomic nervous system (ANS) activity alteration. People beyond 65 years old are selected on a risk scale by pharmacists, dedicated preventive centers, non-profit organisations and GP. The front-line professionnals attribute the recorder for a night at home. The interpretation of results are performed by cardiologists. The results are transfered to the GP. Participants are oriented towards collective prevention sessions.

Results: From the first 2045 recordings performed, 89.7% are usable (45.3% of men, 54.7% of women). The mean age is 69.8 years old with an average BMI of 28.65. We identifie AF in 2.4%, SAS in 34.35% (severe SAS (AHI>30) in 5.07%) and ANS abnormalities in 68.5% (severe ANS in 17.3%) of them. 21.4% are free of any of the targeted risk factors. There is no difference between the participants depending on the mode of recruitment. Qualitative analysis shows that a vast majority of the participants consult their GP after the screening but only a few are refered to collective prevention sessions.

Conclusion: This preliminary results show that a prevent’s stroke program including front-line professionnals is possible. This procedure is efficient in detecting significant risk factors in an asymtomatic population. It allows the GP to act firstly on their high risk patients. Healthcare education was targeted. Through the proximity and receptiveness of the front-line professionnals, it helps decrease territorial inequality.

Keywords: stroke, primary prevention, elderly, accessibility.
P04S

**Embolic stroke secondary to an aortic valve fibroelastoma: an increasingly recognised rare cause of stroke.**

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**Background:**
Based on autopsy studies, primary cardiac tumors (PCT) are infrequent, occurring in 0.001-0.03% of the population. Their pathophysiology is partially unknown, being cardiac papillary fibroelastomas (CPFEs) historically known as the second most common benign PCT after myxomas. Most CPFEs are incidental, but when they are symptomatic, stroke or TIA is the most common clinical presentation.

**Material and methods:**
We report a case of a 59-year-old gentleman with sudden severe bilateral hearing loss, gait instability, dysarthria and left limbs clumsiness.

One year before, he developed a right palmar digital artery thrombosis, without significant findings in the etiological study.

**Results:**
A brain MRI, 15 days after the symptoms started, showed a subacute ischemic stroke involving both insular cortex and right frontotemporal lobes.

Blood tests, including hypercoagulability and autoimmunity, were normal. Duplex study of supraaortic arteries was common and no potentially embolic arrhythmic events were found.

The transthoracic echocardiography (TTE) revealed a thickened aortic valve with a pediculated mobile 29mm-length mass anchored to the left coronary leaflet. There was mild-to-moderate aortic regurgitation with preserved left ventricular ejection fraction.

These findings suggested a vegetation or a cardiac tumor. Regarding the fact that the patient had not presented fever or general malaise and the four sample blood cultures were negative, endocarditis was less probable.

A multidisciplinary team decided on surgical treatment. After aortic valve resection a metallic aortic prosthesis was implanted, with favorable evolution.

Pathologic examination of the surgically removed pieces confirmed the CPFE diagnosis.

**Conclusions:**
We present a multiple embolism case related to a giant CPFE in the aortic valve. Despite being normally benign, CPFE may be the cause of embolism. Surgical treatment is effective and secure so we should consider this entity in the etiological study of patients with embolic profile cerebral ischemia.
P06S

Patients with history of premature stroke in outpatient practice: cardiovascular multimorbidity, drug treatment and adherence

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Aim. To assess cardiovascular multimorbidity, drug treatment and adherence in patients with history of stroke enrolled into the outpatient registry.

Methods. 986 patients with history of stroke (age 70.6±10.9; 57% women) were enrolled. The age criteria of premature stroke (pS) were <55 years for men (n=59) and <65 years for women (n=121). The presence of hypertension (HT), coronary heart disease (CHD), heart failure (HF), atrial fibrillation (AF), history of myocardial infarction (MI) and drug administration rate were assessed. Adherence to pharmacotherapy was estimated (four item Morisky Medication Adherence Scale, MMAS-4).

Results. Patients with pS had lower incidence of HT (91.1%vs.96.2%, p=0.004), CHD (42.8%vs.77.5%, p<0.0001), HF (42.7%vs.75.7%, p<0.0001), AF (11.1%vs.28.3%, p<0.0001), recurrent stroke (9.4%vs.19.6%, p=0.001) and cardiovascular comorbidity (67.8%vs.87.3%, p<0.0001). In men with pS we revealed higher than in women incidence of CHD (66.7%vs.38.8%, p=0.03), AF (20.3%vs.6.7%, p=0.006), history of MI (32.2%vs.4.4%, p<0.0001). Patients with pS had higher, but not sufficient, prescription rate of ACE inhibitors in post MI cases (66.7%vs.38.7%, p=0.0068), beta-blockers in HF (55.3%vs.35.4%, p=0.0004), anticoagulants in AF (35.0%vs.12.3%, p=0.005), higher overall rate of prescription of “prognosis-modifying” drugs (60.6%vs.49.0%; p<0.0001). At the same time the administration of metabolic and vascular agents without evidence-based background was registered in 53.3% vs.58.4% of cases, p=0.21. The proportion of high adherence to pharmacotherapy was bigger in patients with pS (40.3%vs.30.0%, p=0.01), average MMAS-4 score was 2.27±1.68vs.2.12±1.55, p<0.001. More men with pS had low adherence comparing to women with pS (51.0%vs.29.5%, p=0.009).

Conclusions. Patients with history of premature stroke had a lower incidence of HT, CAD, CHF, AF and recurrent stroke; higher, but not sufficient, quality of cardiovascular pharmacotherapy, higher adherence to the drug treatment. Cardiovascular comorbidity in the group of premature stroke was less pronounced than in older group, but was registered in the most part of cases in both groups.
P07S

The perspective of using the genetic risk score in prognosis of cardiovascular complications in patients with arterial hypertension

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Arterial hypertension (AH) is a significant risk factor for cerebrovascular diseases. For prognosis of cardiovascular complications it is mostly used the scale SCORE. The usage of genetic risk scores is on the stage of studying. The purpose of research was to compare proposed genetic model based on the evaluation of genetic polymorphisms and formed gene modification index (GMI) with SCORE in patients with AH.

Methods. 245 patients with AH were examined (age 58,6 [40-72], male/female 120/125), stratified according to SCORE (ESC 2016) and divided into 4 groups: with low, moderate, high or very high CVR. There were analysed the following polymorphisms: ADD1:1378, AGT:704, AGT: 521, AGTR1:1166, AGTR2: 1675, CYP11B2:-344, GNB3:825, NOS3:-786, NOS3:894. The GMI was formed where the proportion of "pathological" homozygous polymorphism of one gene was 1.5 points, the heterozygous polymorphism – 1 point, "normal" genotype – 0 points. GMI is calculated by the formula: GMI=(N/13,5)×100, where N is the sum of points of present genetic polymorphisms: N=n1+n2+n3+n4+n5+n6+n7+n8+n9; 13,5-the maximum number of points. The GMI from 0 to 20% was considered as low genetic risk (GR), 21-40% - moderate GR, 41-70% - high GR, 71-100% - very high GR.

Results. According to SCORE in group with low CVR were 27 patients, while in 70,4 % of patients was similar low GR (r=0,67, p<0,01). In group with moderate CVR were 96 patients, of which 71,9 % had moderate GR (r=0,69, p<0,01). In group with high CVR were 73 patients, 68,5 % had high GR (r=0,65, p<0,01). In group with very high CVR were 49 patients, 65,3 % had same very high GR (r=0,64, p<0,01).

Conclusions. Proposed genetic risk score based on evaluation of genetic polymorphisms has a significantly high correlation with SCORE and can be recommended for practical using in patients with AH for prognosis of cardiovascular complications and primary prevention.
P08S

Cognitive function status and brain changes in patients with chronic heart failure and sinus rhythm

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Background. Cognitive impairment (CI) is observed in majority of chronic heart failure (CHF) patients (pts). Atrial fibrillation is an important risk factor of silent cerebral infarction and CI in this category of pts. At the same time, prevalence of CI and brain changes in pts with CHF and sinus rhythm are studied insufficiently.

Objective: To establish brain changes and cognitive function status in CHF pts with reduced left ventricular ejection fraction (rLVEF) and sinus rhythm.

Material and methods. 37 stable CHF pts, non older than 75 years, NYHA II-IV, with left ventricular ejection fraction (LVEF)<40% and sinus rhythm, without history of stroke or atrial fibrillation were examined. Cognitive function was evaluated by using standard MMSE test. Cognitive dysfunction was defined as MMSE≤26 points. Besides routine clinical examination, non-contrast head Magnetic Resonance Imaging was performed.

Results. CI was observed in 22 (59.5 %) patients. Silent brain infarctions were detected in 12 pts (32.4%), in 8 cases they were multiple. The infarcts were more than 15 mm in axial diameter in 3 pts. White matter hyperintensity was observed in 24 (64.8%) pts. CI was associated with the presence of lacunar strokes (p=0.004), their quantity (p=0.004) and larger infarct size (p=0.001).

Conclusion. CI was observed in 63.8% of stable CHF pts with sinus rhythm. Silent cerebral infarctions were detected in 32.4 % of cases. CI was reliably associated with the presence of infarctions, their quantity and size.
A New Echocardiographic Score in Patients With Stroke

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Background: Clinical features and risk factors that consistently predict Major Adverse Cardiovascular Events (MACE’s) have been identified, while echocardiographic characteristics are less well defined. The purpose of this study is to create an echocardiographic score that gives clinical information and the risk of having a recurrence of MACE in patients with stroke.

Material and Methods: Retrospective study with transthoracic echocardiographic findings and clinical features (chi-square test) from 170 patients that were admitted to a stroke unit with the diagnosis of ischemic stroke, between February 1 from 2013 and September 30 from 2014, with a follow-up over 5 and a half years on average. The independent predictor value of echocardiographic findings was calculated by logistic regression. Echocardiographic score includes three criteria: the volume of the left atrium; the presence of mitral disease, both insufficiency and stenosis and the ejection fraction (EF) moderate and severe.

Results: Out of 170 patients, with a mean age of 65.21 ± 14.2 years, 48.8% were male (n=83). In this population, 57.6% had history of hypertension, 33,5% dyslipidemia, 21,8% diabetes and 12,9% had history of atrial fibrillation. During this follow-up, 34,1% patients had recurrence of MACE’s.

The patients that have already had a stroke and also have dilated left atrium, mitral disease or reduced EF moderate/severe (just one factor), 25.8% had MACE’s. Patients with two or three of these factors, 38.8% had MACE’s versus 2.8% that hadn’t MACE’s (p-value<0.001). In logistic regression, patients with at least one of these echocardiographic findings have more risk of MACE’s.

Conclusion: This echocardiographic score, with these three main criteria may predicts the risk of MACE’s in patients that have already had an ischemic stroke. Larger studies should reproduce and validate these findings.
P10S

Hypertension as an important cause of recurrence of atrial fibrillation and remodeling of the left atrium after catheter isolation of pulmonary veins.

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Background: An increase of systolic blood pressure leads to higher diastolic pressure in left ventricle and to growth of average pressure in left atrium (LA), which, in turn, leads to remodeling of LA and the development of atrial fibrillation (AF). Pulmonary vein isolation (PVI) is still the cornerstone of AF treatment. There are different opinions about the role of hypertension (HTN) as a risk factor for AF recurrence. Also LA structural changes remains unresolved after such procedures.

Material and Methods: 108 patients were included (female patients - 53 (49,1%)). Median age was 59 years. Paroxysmal (n=90; 83%) and persistent (n=18; 17%) form of AF. All patients underwent PVI and were divided in two groups. Patients with HTN (n=87; 80%), without HTN (n=21; 20%). All had pre procedural and after 12 months detailed echo measurements of LA.

Results: Patients with HTN were older (p<0.001), with a higher BMI (p<0.001). After 12 months 61 patients (56.5%) held sinus rhythm. The presence of HTN has been associated with AF recurrence after PVI (OR 3,3; 95% CI 1,1–9,9; p=0,024). The thickness of the ventricular septal had statistically significant differences depending on the effectiveness of the procedure (p=0.043). The dynamics of LA size changing was analyzed in patients keeping sinus rhythm, with the presence and absence of HTN. It was revealed that the remodeling of LA continued in the background of sinus rhythm retention in patients with HTN in history (increase in indexed (p=0.026) and pre systolic volume of LA (p=0.027)), while in patients without HTN an enlargement of LA was not recorded.

Conclusion: The recurrence of arrhythmia after PVI may be due to the presence of HTN. Also, only in the group of patients with HTN in the history, continued remodeling of the LA was noted, despite the long-term retention of sinus rhythm.
P11S

Primary and secondary stroke prevention by MicroNET-covered stent sequestration of high-risk carotid stenosis on top of optimized medical therapy: 5-year evidence from the PARADIGM-Extend prospective academic trial

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PARADIGM-Extend= Prospective evaluation of All-comer peRcutaneous cArotID revascularization in symptomatic and Increased-stroke-risk asymptomatic carotid artery stenosis using CGuard™ Micronet-covered embolic prevention stent system - clinical trial extension

Background: Available data indicated that MicroNET-covered embolic prevention stent system (CGuard EPS) effectively minimizes cerebral embolization in carotid artery stenting (CAS) peri- and post-procedurally but long-term safety and efficacy has not been determined. We aim to provide long-term clinical (including neurologic) and duplex ultrasound (DUS) evaluation of the CGuard routine use to perform CAS in all-comer, all-referrals-tracked PARDIGM-Extend study population with symptomatic or increased-stroke-risk asymptomatic carotid stenosis.

Materials, methods and results: Currently 442 patients (48-87 years, 56.3% symptomatic) with 478 arteries recommended for revascularization by the NeuroVascular Team crossed the trial first follow-up window. There has been 100% CGuard use (Proximal/distal EPD use 48.1/51.9%). Angiographic diameter stenosis was reduced from 84±8% to only 6.9±5% (p<0.001). Independent neurologist evaluation and DUS are performed before and after CAS (48h, 30 days, every 12 months). Data verification, angiographic corelab and statistical analysis are external. Peri-procedural death or major ischemic stroke (IS) rate was 0%. One event was adjudicated as minor IS (0.23%), one as myocardial infarction (MI) (type2: 0.23%). By 30 days there was one haemorrhagic transformation leading to death (0.23 %) and one bleeding-related death (0.23%). There was no major IS by 30 days (0.0%). Thus total death/ stroke rate at 30 days was 0.69%, and total death/stroke/MI rate at 30 days was 0.92%.

By 48 months there were no ipsilateral strokes (0.0%) but there were 3 contralateral strokes and 2 posterior circulation strokes. Post-procedural in-stent velocities were normal and remained normal throughout the 48-month follow-up period. 60-month data will be presented at the 2020 ESC Heart&Stroke Conference.

Conclusions: PARADIGM-Extend long-term clinical and DUS evidence is consistent with unprecedented, sustained safety and stroke prevention efficacy of the MicroNET-covered embolic prevention stent system used routinely on top of optimized medical therapy for stroke prevention in symptomatic and increased-stroke-risk asymptomatic subjects with carotid stenosis.
P12S

Cardiology cathlab-based management of thrombotic carotid stenoses in acute ischaemic stroke: Tools, techniques, local stroke unit collaboration, challenges and patient outcomes - Insights from the PARADIGM-EXTEND all-comer study.

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Background: Shortage of endovascular operators able to deliver thrombectomy in acute ischemic stroke (AIS) on a 24/7/365 basis is a main challenge in health care settings around the world. Another fundamental barrier is getting multispecialy teams to work collaboratively with each other in AIS as is already done (albeit on an elective rather than acute basis) in managing stroke mechanistic pathologies such as AFib (pharmacology/ablation) or PFO (diagnosis/closure).

Material and methods: Within the PARADIGM-EXTEND (symptomatic and increased-stroke-risk asymptomatic carotid stenosis) all-comer study we have treated, on an emergent basis, 17 patients (13 men, age 58-75 years, median 67 years) with AIS caused by severe carotid artery stenoses. All cases were performed as part of our pathway towards a 24/7 thrombectomy stroke service.

Results: All lesions (100%) were thrombotic (mobile thrombus - 29%). Proximal neuroprotection (flow reversal using a CCA-ECA balloon) was used in 15/17 patients (88%); in 2 patients (12%) filter protection was applied as proximal system use was unfeasible. All cases were done under ACT control and using, consistent with the PARADIGM-EXTEND protocol, the MicroNET-covered embolic prevention stent system (CGuard) that was optimized with large balloons/high pressures. There were no procedure- or device-related complications. TIMI/TICI-3 was achieved in all cases. Vascular access closure device use was 76%. A 30-day good clinical outcome (of 0-2) rate was 94%. One patient had a haemorrhagic stroke transformation that finally led to death. By 30 days no new stroke, stent thrombosis, myocardial infarction or other SAE occurred.

Conclusion: Cardiologists skilled in carotid interventions are naturally positioned to deliver AIS treatment. 24/7 interventional services and networks for AMI have long been established and, as demonstrated in our centre, the services and skills can be translated ‘in collaboration with a local stroke unit/neurology’ to AIS. Breaking away from traditionally-perceived “territories” towards working as a multispecialy AIS team is a logical concept that provides an effective healthcare solution for large numbers of stroke patients currently needing ‘and not receiving’ thrombectomy. Working hand in hand with neurology and radiology in managing acute carotid syndromes is thus part of a natural evolution towards full interventional stroke services including thrombectomy.
P13S

Assessing the impact of switching to the Tobacco Heating System on cardiovascular disease: translating basic science into clinical benefit

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BACKGROUND. Cigarette smoke (CS) is causally linked to the development of cardiovascular disease (CVD). Tobacco harm reduction, by substituting cigarettes with less harmful products, is a complementary approach to current strategies for smokers who would otherwise continue to smoke. The Tobacco Heating System (THS) 2.2 is a novel tobacco product that heats tobacco instead of burning it, never allowing the temperature to exceed 350°C, thereby preventing the combustion process from taking place and producing substantially lower levels of toxicants compared with CS.

METHODS. Philip Morris International’s (PMI) assessment program aims to demonstrate that switching to THS has the potential to reduce the risk of smoking-related diseases versus continued smoking.

RESULTS. The results of the THS assessment program demonstrated positive cardiovascular effects in both in vitro, in vivo, as well as in clinical studies. Since the start of THS commercialization in November 2014 and cumulatively up to the end of 2018, eleven cases of MI and five cases of ischemic stroke were reported by users. In most of these cases, no information was provided about the smoking history or the time of switching to THS, which makes it difficult to assess the causal relationship from a medical point of view.

CONCLUSIONS. The evidence available to date indicates that switching to THS has the potential to reduce the risk of smoking-related diseases, such as CVD.

As a next step, PMI will complement its THS assessment program with cardiovascular outcome studies intended to further support the clinical benefits of switching to THS as compared with continuous smoking.
P14S

Risk Stratification of atrial fibrillation and stroke incidence in patients with hypertension and diabetes

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Background
Atrial fibrillation (AF) is expected to increase 2.5 times in the next 50 years; and around 1/3 of ischemic strokes are related to the presence of AF. The main objective of this study is to obtain a stratification model of AF risk in diabetic and hypertensive patients and identify the target groups significantly associated with the risk of stroke in primary care patients.

Materials and methods
Multicenter, observational, longitudinal and retrospective community-based study of a cohort of 8237 diabetic and hypertensive patients without atrial fibrillation between 1/1/2013-31/12/2017. A descriptive analysis was performed. For the identification of the variables associated with the risk of AF, Cox regression was used. With the Cox regression coefficients, the prognostic index (PI) was calculated and 4 risk groups were created.

Results
The AF incidence per 1000 people/years was 10.5 (95% CI 9.5-11.5), higher in men. Prognostic factors were identified: age (HR 1.07 95% CI 1.05-1.09, p <0.001), weight (HR 1.03 95% CI 1.02-1.04, p <0.001), CHA2DS2VASc (HR 1.57 95% CI 1.16-2.13, p 0.003), female gender (HR 0.55 95% CI 0.37-0.82, p 0.004) and heart rate (HR 0.98 95% CI 0.97-0.99, p 0.001). The Q4 risk group had the highest incidence of AF, stroke and mortality. Differences were found in AF and stroke incidence according to gender and risk groups. In men, the Q4 group had the highest AF ID rate (37.6/1000/years 95% CI 25.0-54.4) and the highest stroke ID rate [(4.0/1000/years (95% CI 2.4-6.2)]. In women, the 86% of new AFs happened in Q4 group [19.7/1000/years (95%CI 15.6-24.5)] but the stroke ID rate did not show significant differences among the risk groups.

Conclusions
Risk stratification can be a useful instrument to define the target population and improve the effectiveness of population screening of AF in primary care patients.
Intracerebral hemorrhage during anti-platelet therapy for acute coronary syndrome

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BACKGROUND
Major bleeding is a serious concern about anti-platelet and anti-thrombotic therapy. Intracerebral hemorrhage (ICH) is a major bleeding which can worsen patient prognosis.

MATERIAL AND METHODS
We evaluate the literature for the correct management of a 85-yo male patient with hypertension, dyslipidemia and CKD (stage IV). He was admitted for STEMI treated with a complex PCI on circumflex, left anterior descending, diagonal branch. Dual anti-platelet therapy (DAPT) with ASA and clopidogrel was administered. 10 hours later, we observed an episode of paroxysmal atrial fibrillation with subsequent left frontal lobe hemorrhage causing right arm hemiparesis, aphasia and dysphagia. We stop DAPT because of the worsening of ICH on brain CT scan. The patient undergoes enteral and parenteral nutrition.

RESULTS
We calculate patient’s risk score: CHA2DS2-VASC=4, HASBLED>5, PRECISE-DAPT>25. We find evidence for sub-therapeutic rivaroxaban plasma concentration when administered by PEG-tube and vitamin-K antagonist resistance when administered in enteral nutrition. The RESTART trial validates restarting anti-platelet therapy after ICH for reduction of ischaemic stroke without significant risk of bleeding. ESC 2016 Guidelines on Atrial Fibrillation suggest to withhold anticoagulation for 4-8 weeks after ICH and then resume anti-thrombotic therapy; if contraindication for anticoagulation, consider left atrial appendage occlusion (LAAO) or no stroke protection. Our patient was monitored for 3 weeks without DAPT or antithrombotic therapy and no evidence of adverse events were observed. We restarted DAPT for 6 months following patient into neurorehabilitation (LAAO has been planned).

CONCLUSIONS
Although high ischaemic risk score, the decision of restart anti-thrombotic therapy after ICH should consider the risk of new major bleeding episodes and evaluate the pharmacokinetic profile of each drug. Case-by-case decision making for patient management is mandatory.
P16S

Door to needle count down, a three years experience in an Egyptian university stroke center

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Objectives: The purpose of this study is to share our experience in changing hospital strategies to achieve rapid thrombolysis in acute ischemic stroke patients in Ain Shams University hospitals, Egypt.

Background: Rapid reperfusion by shortening door to needle time reduces morbidity and mortality for patients with acute ischemic stroke (AIS).

Material and Methods: In this retrospective observational study from the SITS-ISTR Dataset, we studied AIS patients admitted to our two stroke centers in Ain Shams University over three successive years from 2016 till 2108. We analyzed door to needle and (after 3 months) differences over these 3 years. Our aim was to evaluate effect of applying certain strategies to reduce door to needle time for thrombolysis and its effect on clinical outcomes.

Results: In 2016, less than 6% of the AIS patients received thrombolysis within the first 40 minutes from hospital arrival, this percent improved to more than 60% in 2018. Regarding clinical outcome, in 2016 less than 50 % of the patients had 2 or less after 3 months. In 2018, more than 70% of patient reached 2 or less after 3 months. There was insignificant difference regarding mortality rate.

Conclusion: Appling of a quality improvement strategy was associated with reduction of door to needle time for thrombolysis of AIS patients in our hospitals, and this improvement was associated with improvement of patients' outcome after 3 months from stroke onset.
P17S

Cardiomyocyte injury following acute ischemic stroke (CORONA-IS) - rationale and design of a prospective observational cohort study

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Background: Elevated cardiac troponin levels as a surrogate for myocardial injury are frequently observed during the first days after acute ischemic stroke (AIS) and are associated with poor functional outcome. There is evidence that in most patients, the underlying mechanism of stroke-associated myocardial injury is not coronary-mediated myocardial ischemia but rather stroke-induced functional and structural interference in the central autonomic network. We hypothesize that this causes a dysregulation of neuronal cardiac control, leading to myocardial edema and stunning (so called ‘Stroke-Heart-Syndrome’).

Methods/Design: CORONA-IS (NCT-03892226) is a prospective, observational, single-center cohort study aiming to recruit 300 patients with AIS. Patients will be evenly distributed into three subgroups (no/chronic/acute-myocardial injury) based on serial high-sensitivity cardiac troponin levels (hs-cTn) measurements. Study procedures include cardiovascular magnetic resonance imaging (CMR) and transthoracic echocardiography (TTE) to visualize cardiac dysfunction and provide detailed tissue characterization, 20-minute Holter-ECG with an analysis of specific autonomic markers, and a systematic biobanking. Telephone follow-up for cardiovascular events will be conducted three and twelve months after enrolment.

Results: Screening started on January 17, 2019. To date, including a three month pilot phase, n=64 patients were enrolled, including 30 (46.9%) with normal hs-cTn levels, 21 (32.8%) with chronic myocardial injury, and 13 (20.3%) with acute myocardial injury. The mean age was 71 (SD ±12) and 36 (40.6%) were female. The median National Institutes of Health Stroke Scale (NIHSS) at enrollment was 2 (IQR 0-3) and the median modified Rankin Scale score (mRS) was 2 (IQR 1-4). Cwas successfully performed in 53 (82.8%) and TTE in 60 (93.8%) of patients. Holter-ECG and blood sampling was successful in 62 (96.9%) cases.

Conclusion: CORONA-IS aims to provide a better understanding of the characteristics and pathophysiology of stroke-induced acute myocardial injury (‘Stroke-Heart-Syndrome’) in order to identify patients at risk and improve diagnostic and therapeutic procedures.
P18S

The course of ischemic cerebral stroke and diabetes mellitus: according to the hospital part of the REGION-M registry

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Background. It’s actual to evaluate the specific features of the course of cerebral stroke in patients with diabetes mellitus within the registry of acute cerebrovascular accident, of patients who were hospitalised acute cerebrovascular accident.

Material and methods. The hospital registry of acute stroke (REGION-M) was organized in one of the cardiovascular centers in Moscow. From 2012 to 2017, 900 patients were included in the REGION-M registry, who were consecutively admitted to one of the clinics in Moscow, and in whom cerebral stroke or transient ischemic attack were diagnosed during hospitalization.

Results. Patients with diabetes were older than patients without diabetes: 73.7 ± 11.1 years versus 69.6 ± 14.7 years (p <0.05), more often had a history of coronary heart disease (74.2% vs 52.3%, respectively) (p <0.05), myocardial infarction, (29.6% and 16.6%, respectively) (p <0.05). The average age of patients with diabetes was significantly larger (73.7 ± 11.1 years for patients with diabetes, and 69.6 ± 14.7 years without diabetes). Arterial hypertension was found in most patients with stroke, but in patients with diabetes it was significantly more likely (98.1% and 94.2%, respectively) (p<0,05). Obesity, anemia, kidney disease, and chronic lung disease were significantly more likely to occur in patients with diabetes than without it. The presence of diabetes increased the risk of death by 2.1 times (OR = 2.1 CI 95% (1.5 · 3.0) (p <0.05). After making corrections for other factors with adverse influence on hospital mortality (elderly age, the presence of coronary heart disease, the atrial fibrillation and history of thrombosis) diabetes mellitus retained its negative influence on life prognosis.

Conclusion. The presence of diabetes mellitus significantly complicates the course of stroke and is an independent predictor of hospital mortality.
P19S

Myocardial infarction and stroke cross-talking

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Background: Heart disease and stroke are bidirectional risk factors for one another. The extent of this association is, however, under-reported. The purpose of this study is to ascertain the influence of incidental stroke on the outcome of patients with acute coronary syndromes (ACS).

Methods: Retrospective single-center study comprising patients consecutively admitted into a Cardiac Intensive Care Unit, between May 2009 and December 2017, for ACS, in whom personal history of stroke was assessed. In-hospital mortality was evaluated and follow-up targeted all-cause mortality, reinfarction, stroke, percutaneous coronary intervention (PCI), hospital admission for acute heart failure (AHF) and major bleeding, defined as moderate-to-severe according to GUSTO criteria. Statistical analysis was performed using SPSS version 25.

Results: 1165 patients were included. Mean age was 68.0 ± 13.3 years and 30.4% were female. 37.2% presented with STEMI and mean GRACE score was 115.6 ± 55. In-hospital mortality was 6%, while median follow-up was 6 years, encompassing event rates as follows: all-cause mortality, 36.9%; reinfarction, 19.4%; stroke, 5.9% (of those, 85.5% of ischemic type); PCI, 21.1%; AHF, 16.6%; and major bleeding, 3.5%. Personal history of stroke was associated with an increasing risk of death during follow-up [ZRES 2.5, OR 1.7 (95% CI 1.1-2.6), p=0.019], stroke [ZRES 5.3, OR 4.8 (95% CI 2.5-9.0), p<0.001] and AHF [ZRES 3.6, OR 2.5 (95% CI 1.5-4.1), p=0.001]. A trend towards a higher likelihood of reinfarction [ZRES 1.9, OR 1.6 (95% CI 0.97-2.7), p=0.083], PCI [ZRES 2.0, OR 1.6 (95% CI 0.99-2.7), p=0.051] and major bleeding [ZRES 1.9, OR 1.7 (95% CI 0.98-2.9), p=0.080] was also found. In-hospital mortality did not differ substantially between previous stroke statuses.

Conclusion: Personal history of stroke seems to play a major role on the long-term aftermath of patients with ACS. Main outcomes to keep a lookout for are mortality, recurrent stroke and AHF.
P20S

PRediction of Acute coronary syndrome in acute Ischemic StrokE – The PRAISE study

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Background:
Cardiac troponins can detect cardiomyocyte damage with high sensitivity and specificity. Their use for diagnostic algorithms in acute coronary syndrome is well-established and recommended by the current guideline of the European Society of Cardiology (ESC). Elevated troponin levels are also found frequently in stroke patients. Elevated troponin indicates poor functional outcome and a high mortality in acute stroke patients. Therefore, current guidelines recommend routine measurement of troponin in stroke patients. It remains unclear if the laboratory pattern of troponin elevation in stroke patients indicates acute coronary syndrome or other forms of cardiomyocyte damage. The TRELAS study showed that about 25% of ischemic stroke patients with significant troponin elevation have target lesions on coronary angiography, but numbers were too small to give advice for clinical practice. The main goal of the PRAISE study is to develop a diagnostic algorithm that allows the prediction of acute coronary syndrome in ischemic stroke patients with elevated troponin.

Methods:
In this observational, multi-center trial stroke patients with elevated troponin levels above the ESC rule in cut-off will undergo a systematic cardiovascular work-up, including serial measurement of cardiac troponin (at 0 and 3 hours), cardiovascular risk scores, ECG, transthoracic echocardiography and coronary angiography. ECG, echocardiography and coronary angiography will be evaluated by independent core laboratories blinded for clinical details. A blinded endpoint committee will establish the diagnosis of acute coronary syndrome. This is a nationwide joint project by cardiologists and neurologists funded by the German Center for Neurodegenerative Diseases (DZNE) and German Centre for Cardiovascular Research (DZHK).

Results:
To date, 23 sites in Germany participate in the study and nearly half of the intended 251 patients are recruited.

Conclusion:
The ongoing PRAISE study will provide guideline relevant information for the management of acute ischemic stroke patients with cardiomyocyte damage as indicated by elevated troponin levels.
P21S

Noninvasive ventilation in severe ischemic stroke victims

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Introduction: noninvasive ventilation (NIV) is a common and widespread method of ventilatory support in patients with respiratory failure of different origin. However, little data are available regarding role of NIV in patients with stroke.

Materials and methods: we conducted a prospective, randomized, open-labeled trial in a 9 bed mixed ICU. We included patients with acute ischemic stroke, admitted to ICU due to respiratory failure with PaO2<70 mmHg OR pH <7,2, able to secure airways and not requiring intubation at admission. Patients with do-not-intubate status (at any moment) were excluded from the trial. We randomized patients into NIV group (ventilation with Draeger Carina machine via a full face mask with CPAP/PSV mode and initial settings: PEEP 5 cm H2O, PSV 10 cm H2O, FiO2 50% with further adjustment) or usual care (UC) group (oxygen flow via nasal tube or face mask). We assessed 30-days mortality, intubation rate and aspiration events rate (aspiration were defined as new X-ray finding AND physician’s record). Binary outcomes were assessed with Chi-square test and continuous variables—with Mann-Whitney test.

Results: 32 patients were included into trial (17 in NIV group, 15 in UC group). Groups not varied significantly in age, gender and initial NIHSS score. 1 patients died in NIV group and 2 in UC group, p=0,470). 3 (17,65%) patients in NIV and 7 (46,67%) in UC group were intubated (p=0,0771). Main reasons for intubation were: aspiration, worsening of hypoxemia, failure to maintain airway patency.

Conclusion: no significant difference in mortality rate was found. There was a strong trend to lower intubation frequency in NIV group; however, difference remained insignificant. NIV may play role in care for stroke patients with borderline respiratory disorders and in a smaller facilities with limited access to full-scale mechanical ventilation.
P22S

Management of thrombotic risk in patients with acute coronary syndrome with concomitant atrial fibrillation

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Atrial fibrillation remains a major cause of stroke, 20-30% of cases in the UK, which is mitigated by anti-coagulant use (Warfarin (VKA) or Direct Oral Anti-Coagulants (DOAC)). Acute coronary syndromes (ACS) have anti-platelet therapy as a cornerstone of treatment. There remains clinical heterogeneity in use of “triple therapy” (anti-coagulant therapy and dual anti-platelet therapy) or varying combinations of anti-thrombotic therapy in patients with AF and ACS. This is in part due to patient specific factors and a lack of comprehensive evidence base.

Our aims were:
• Identify patients discharged from Newham University Hospital (NUH) with a diagnosis of Atrial Fibrillation (AF) and Acute Coronary Syndrome (ACS)
• Review the anti-thrombotic medication they were advised on discharge and compare this to international guidelines

The inclusion criteria were:
• Patients discharged from Newham University Hospital (NUH) with a diagnosis of Atrial Fibrillation (AF) and Acute Coronary Syndrome (ACS)
• To have been advised anti-thrombotic therapy on discharge post management of ACS including (but not limited to) medical management or inpatient angiogram +/- angioplasty.

There were 29 eligible cases. Those receiving medical management only were: STEMI (4), NSTEMI (4), UA(1). Anticoagulation used:
• Apixaban (2), Warfarin (2) and Rivaroxaban (2)

When antiplatelet used in combination with anticoagulation clopidogrel is preferred Of those discharged on an oral anticoagulant, less than 1/3rd had documented anticoagulation follow up on discharge.

Of all ACS cases included in the study, 55% had cardiology outpatient follow up documented in the discharge summary.

New recommendations identify anti thrombotic therapy as a dynamic thinking process which should be reviewed in light of changing condition so confirmed follow up is crucial as well as clear plans for duration in discharge paperwork. We recommend trying to addressing modifiable risk factors to reduce bleeding risk (for example known benefits of NOAC over VKA).
P23S

Routine use of Transoesophageal Echocardiography (TOE) in patients with atrial fibrillation or flutter undergoing cardioversion

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Background. According to the recent guidelines, effective anticoagulation is recommended for a minimum of 3 weeks before the cardioversion of Atrial Fibrillation/Flutter. Transoesophageal echocardiography (TOE) could be considered, but is not mandatory to exclude/confirm the cardiac thrombus before the cardioversion in adequately anticoagulated patients.

Aim of the study was to reveal the incidence of thrombus by TOE before cardioversion, despite effective anticoagulation.

Material and methods. Patients, where TOE was performed to evaluate the evidence of thrombus/SEC before the cardioversion of Atrial fibrillation/flutter at our clinic in period of 2016-2018, were studied. Incidence of intracardiac thrombus and its relation to patients’ gender, age, hypertension, diabetes, atrial diameter, LVEF, duration of anticoagulation regimen were evaluated.

Results. All patients received recommended anticoagulation therapy, for a minimum of 3 weeks before the TOE. Patients were divided in two groups: group 1 (121 patients) without evidence of thrombus and group 2 (59 patients) where TOE revealed the thrombus (thrombus in 37 (20.5%) , SEC in 22 (12.2%) patients). There were no difference between the two groups with respect to: gender (85 male (70%) in group 1 vs. 38 male (64%) in group 2, p=NS), age (62.8±8.73 vs. 63.0±9.04, p=NS), hypertension (78 (64.4%) vs. 44 (74.6%), p=NS), diabetes (17 (14%) vs. 7 (12%), p=NS), CHAD2DS2-VASc score (2.2±1.8 vs. 2.4±4.0, p=NS), LVEF (48.1±7.1% vs. 46.4±7.3%, p=NS), duration of arrhythmia (7.7±11.6 months vs. 9.7±14.0 months, p=NS), type on anticoagulation (DOACs 59 (48.3%) vs. 30 (50.8%), p=NS, VKA (Warfarin) 54 (44.6%) vs. 29 (49.1%), p=NS)) respectively. Only difference in atrial diameter was found statistically significant between the two groups: left atrial diameter (42.6±3.3mm vs. 45.3±3.6mm, p<0.001) and right atrial diameter (39.4±3.3mm vs. 40.8±2.3mm, p=0.001) respectively.

Conclusion. Thrombus/SEC could persist despite the effective anticoagulation therapy for ≥3 weeks. Therefore all patients should perform TOE before the cardioversion.
Efficacy and safety of NOACS versus Warfarin in Atrial Fibrillation: a first registry with Ecuadorian population

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Background: Atrial fibrillation (AF) is the most common sustained arrhythmia associated with a fivefold increase in the risk of stroke. Novel Oral anticoagulants (NOACS) have been shown non-inferior compared with warfarin regarding stroke prevention but there are no available registries of its efficacy in Ecuador.

Methods: Retrospective, observational, unicenter cohort study that included 255 patients with Non Valvular Atrial Fibrillation (NVAF) between 2012 and 2017, who had consumed either Rivaroxaban, Dabigatran or Warfarin for at least 6 months. We used the Kolmogorov Smirnov test to evaluate normality. T Student, ANOVA and Mann Whitney test were used to compare quantitative variables and Chi² for qualitative variables while the chance of an event occurring was ased with Cox regression.

Results: A total of 255 patients were enrolled: 61 (23.9%) received Warfarin, 96(37.6%) Rivaroxaban and 98 (38.4%) Dabigatran with a mean follow-up 15.6 months. The population was predominantly male (76.8%), mean age was 72.6 years, 92.9% with CHA²DS₂-VASc≥2 and 27.1% with HAS-BLED≥3. The stroke-free rates were: Dabigatran 98%, Rivaroxaban 97.9% and Warfarin 90.2%. There was no difference between Rivaroxaban and Dabigatran. Either, Rivaroxaban or Dabigatran was better than Warfarin for preventing stroke HR 0.202 (95% CI 0.05-0.720) p<0.05. There was no statistically significant difference preventing death with any of these anticoagulants HR 0.330 (95% CI 0.034-3.11 p=0.308). About the safety: 14 individuals had minor bleeding and major bleeding occurred in 12 patients. The frequency of major bleeding was similar in all the groups while the occurrence of minor bleeding was higher in Warfarin group (11.5% p=0.04).

Conclusion: NOACS were associated with better results than Warfarin for prevention of stroke but there was no difference in the risk of major bleeding. Results were similar to other studies but a bigger population is required to complete the registry.
P25S

Decreased left atrial strain can predict stroke despite the presence of atrial fibrillation in patients with acute heart failure

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Background: Stroke is one of major cardiovascular diseases having high mortality and morbidity. Because left atrial (LA) function is known risk factor of developing stroke, echocardiographic evaluation of LA function can give clue to predict stroke. We evaluated the predictive value of global longitudinal strain (GLS) of LA in patients with acute heart failure (AHF).

Materials and Methods: We screened consecutive patients with AHF admitted to 3 tertiary hospitals from January 2009 to December 31, 2016. Of them, we randomly selected patients with suitable echocardiographic images to measure LA strain.

Results: We included 3818 admitted patients (2017 males, 70.6±13.8 years old). Mean LVEF was 40.2±15.5% and 2036 patients (53.3%) were classified into HF with reduced EF (HFrEF), 591 (15.3%) into HF with midrange EF (HFmrEF) and 1191 (31.2%) into HF with preserved EF (HFpEF). LAGLS was 14.7±10.1%. We found 176 stroke events during the follow-up duration (mean duration: 30.3±25.4 months). In patients with stroke, blood pressures were higher (P=0.024 for systolic, and P=0.033 for diastolic), atrial fibrillation (AF) were prevalent (P=0.027), and left ventricular (LV) GLS (P=0.010) and LAGLS were lower (P<0.001) significantly compared with patients without stroke. In the univariate analysis, age (HR=1.023, 95% CI=1.011-1.036, P<0.001), AF (HR=1.472, 95%CI=1.082-2.002, P=0.014), Total cholesterol (HR=0.996, 95% CI=0.993-1.000, P=0.046), LVGLS(per 1% decrease, HR=1.061, 95% CI=1.027-1.097, P<0.001), LA volume index (HR=1.004, 95% CI=1.001-1.007, P=0.006) and LAGLS (per 1% decrease, HR=1.049, 95% CI=1.030-1.069, P<0.001). In the multivariate analysis, age (HR=1.020, 95% CI=1.007-1.034, P=0.004) and LAGLS (HR=1.044, 95% CI=1.018-1.070, P=0.001). Patients with LAGLS<10.0% had 1.651 fold higher incidence of stroke after adjustment of age, sex, hypertension, AF and LVGLS (HR=1.651, 95% CI=1.141-2.389, P=0.008).

Conclusions: LAGLS was a good predictor of the developing stroke despite other risk factors including age, hypertension and AF in AHF patients. LAGLS <10.0% can be regarded as a predictor of stroke.
P26S

Impact of continue medical education according with current guidelines on rate of cardioembolic stroke in patients with atrial fibrillation: a single center experience in Kazakhstan

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Background. Oral anticoagulants (OAC) reduce the risk of cardioembolic stroke (CES) in patients with atrial fibrillation (AF). Despite this, we have previously observed that, in a single center registry (six month in 2013), aspirin was the drug widely used while only 8% of AF-patients were on OAC. Since a Continuing Medical Education (CME) program was applied according to current ESC Guidelines (GLs) for the management of AF, we have evaluated whether CME might change therapeutic approach and consequently, the rate of CES in AF patients referring to the same center. Moreover, we have retrospectively analyzed the number of CES in our population from 2013 to 2018 evaluating the impact of ESC GLs (2016).

Material and Methods: Consecutive patients admitted (six month in 2017) were enrolled. All clinical data including duration of AF, EHRA index, CHA2DS2-VASc and HAS-BLED score, number of strokes and OAC therapy were collected. Data were compared with those of the 2013-registry.

Results. Of 292 patients enrolled, 30 (10.27%) had AF. The average age was 78 ± 10 years. The average risk of stroke according with CHA2DS2-VASc in women was 4.6 ± 0.65, in men 4.02 ± 1.43. Ten patients received vitamin K antagonists, 5 patients received rivaroxaban, 4 patients received apixaban and 3 dabigatran. One patient did not received OAC because at high bleeding risk (HAS-BLED=5) and other two were not on OAC. Thus, 6.6% patients did not receive OAC in contrast with 92% of AF-patients observed previously. Analysis of CES indicated that number of CES decreased from 52% (before ESC GLs) to 22% (after ESC GLs).

Conclusions: Our study, with all limitations of a single center study, clearly demonstrates how CME based on current GLs might significantly improve stroke prevention by decreasing number of CES in AF patients, in a selected hospital of Kazakhstan.
Recurrent strokes on NOACs

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Background:
Atrial fibrillation (AF) is a major risk factor for recurrent ischemic stroke. Warfarin was the most important drug to prevent stroke in patients with AF. In recent years, new oral anticoagulants (NOAC) have been used in clinical practice in the treatment of non-valvular AF. In our daily clinical experience, we encounter with thromboembolic events and a few hemorrhage as a result of administration of a dose lower than the appropriate drug dose for the patient, non-compliance with the treatment or inadequate protection of the drug from recurrent stroke. We reviewed the patients presenting with recurrent stroke under NOAK treatment in our center.

Material and methods:
73 of 2606 patients admitted to our center with stroke between 01.01.2018-01.09.2019 were evaluated. Patients whose current event was under NOAC treatment were included. Patients were classified according to gender, age, drug used, NIHSS, and clinical event.

Results:
The mean age of the patients was 76, mean NIHSS: 5.62, Rivaroxaban 15 mg was the most commonly used drug (23.3%). Left middle cerebral artery territory was the most commonly affected area. Intracerebral hemorrhage was seen in 7 patients (9.2%). It was seen that 20 patients (27.3%) were taking a dose lower than the dose appropriate for the patient. Although it was observed that the strokes in the low-dose group were more severe according to NIHSS, there was no statistical significance (p>0.63).

Conclusions:
The use of NOACs in the prevention of strokes in nonvalvular AF has become widespread in recent years because of the advantages such as no need of monitoring and few drugs and foods interaction compared to warfarin. The clinical consequences of inadequate dosing of NOACs can be estimated. However, even in effective dosing, recurrent strokes were observed. The question now arises: Is there a inconsistency between multicentre clinical trials and our clinical experience?
P28S

Incidence and impact of atrial fibrillation on cerebrovascular events in Polycythemia Vera

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BACKGROUND:
Polycythemia Vera (PV) is a rare myeloproliferative neoplasm usually having ischemic stroke/thrombotic episode as presenting complaint. According to guidelines the prevention of thromboses is based on the association of cytoreductive drug and low-dose aspirin. However, the presence of atrial fibrillation (AF) obliged to optimize treatment management.

METHODS:
Case records at the Ternopil University Hospital between 2017 and 2019 were screened to identify patients with PV and cerebrovascular events. Clinical history, CHA2DS2-VASc and HAS Bled assessment, ECG recordings, laboratory findings were assessed.

RESULTS:
Within 106 PV patients we found 28 (26.4 %) (15 males and 13 females, mean age 71 ±7 years) who had a stroke history: 16 (57.1%) had an ischemic stroke; 11 (39.3%) - a transient ischemic attack; and 1 (3.6%) - hemorrhagic stroke. Compared with the general PV population, stroke-PV patients presented with significantly higher levels of hemoglobin (P<0.001).
We identified 18 patients carrying atrial fibrillation (AF) (64.2 % in stroke-PV patients vs 16.2 % in general PV patients P<0.001). AF was at least as frequent in older PV patients as in general population. Permanent AF was found in 7 (38.9 %) patients, paroxysmal in 11 (61.1 %).
Sixteen patients had a high risk CHA2DS2-VASc score and 2 had a low risk; 3 patients had high, 14 medium and 1 had low risk HAS -BLED score. Considering these scores, every patient should have underwent an anticoagulant treatment.

CONCLUSION
The association of AF and PV is not rare clinical findings which increased the thrombotic risk of these patients. Anticoagulant drugs should be carefully managed between cardiologists, neurologist and hematologists. Association of law dose aspirin and vitamin K antagonists or direct anticoagulants in such population should be discussed to reduce the thrombotic rate.
P29S

Stroke-like symptoms as presenting symptoms of Nerium oleander toxicity

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Background:
Nerium oleander toxicity has been well described in the literature since the antiquity. It principally affects the heart, causing possibly fatal cardiac arrhythmia, and the gastrointestinal system with symptoms such as nausea and vomiting, excess salivation, abdominal pain and diarrhea. Neurological symptoms such as tremor, seizures and coma have also been described.

Method:
Case report

Results:
We describe the case of a patient presenting to the emergency room in a state of acute confusion, with marked dysphasia characterized by impairment in word naming, repetitions and speech fluency as well as word perseverations. After a stroke was ruled out, the patient developed heart arrhythmia which necessitated cardio-pulmonary resuscitation and later, admission to the intensive care unit.

Conclusion:
Nerium oleander toxicity is principally due to the presence of cardiac glycoside, mainly oleandrin and oleandrigenin, affecting the functioning of the Na-K ATPase. Unless digoxin (another well-known cardiac glycoside) which does not cross the blood brain barrier, oleandrin has been shown to accumulate in the central nervous system in murine models. Neurological focal signs, even not previously described, can be caused by oleandrin or other compounds of Nerium oleander. Early recognition of Nerium oleander poisoning is critical since it can often result in patient death.
P30S

**Stroke in the young's :about a young woman case**

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**Background:**
According to the epidemiological data, the stroke’s incidence is clearly growing, especially in young people under 45. Ischemic stroke is the most common type (80%). Many risk factors have been identified, including hypertension, tobacco, dyslipidemia, diabetes, alcohol, and oestroprogestogenic contraceptive pill. The main aetiologies are: atheroma of large arterial trunks, occlusion of small cerebral arteries unrelated to atherosclerosis and cardio-embolic causes. The aim of our study is to present a clinical case of ischemic stroke in young subject caused by a heart disease at high embolic risk.

**Material and methods**
A 27-year-old woman presented an ischemic stroke 6 days before admission. At that time, he was conscious but agitated, presenting aphasia and right hemiparesis. Supra-aortic ultrasound confirmed the presence of a total thrombosis of the left internal carotid artery whereas the angio-MRI demonstrated an acute ischemic stroke in both superficial and deep territory of the left sylvian artery and the ipsilateral posterior cerebral one. An echocardiography was performed showing a 14 mm floating mass in the left atrium with a preserved left ventricular function. The patient was undertaken in the operating room and the mass resected.

**Results:**
The postoperative course was uneventful. The pathological study confirmed the left atrial fibrous thrombus.

**Conclusion:**
Stroke represents a public health issue due to its care cost and its residual disability consequences. Given the multiplicity of aetiologies that characterize this disease in young patients, a rigorous etiologic investigation is set in motion to implement the most appropriate therapeutic strategy.
P31S

Insight stroke – from a physician to a patient and back

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Abstract
Dierk Heimann is a German family and renowned medical journalist who was hit by a severe stroke (Thrombosis of dist. A. basilaris) in 2015 due to paroxysmal atrial fibrillation. Against all odds he recovered, restarted his working life as a physician and journalist in 2016 from scratch and published in 2019 a bestseller book about his unique experiences in Germany. His book was honoured by the German ‘Health Angel Media Award’. He is often invited to empower patients and care giver teams not to give up against a life-threatening and life-changing challenge like a stroke. His insights from a ‘professional first-person-perspective’ reflect many well-known medical behaviours, procedures and habits from a critical ‘colleagues-patient’ point of view. Several newspaper, radio and television stations have asked him to join their talk shows.

Heimann (51) is married to a psychiatrist, father of three children and for years a ESC- and EAPC-member. His videos about ESC- and EAPC-congresses and news are published by Medical Tribune in Germany regularly.

Michael Hennerici (ESRF) who treated Heimann in 2015 at his former neurological department at the University hospital of Mannheim (Germany). “Due to his professional background as a physician and medical journalist he was able to write a unique and brilliant book. Even after more than 30 years dealing with strokes, I learned a lot of things I never heard before.”
P32S

Athens torments Aphrodite - Cardiac havoc during stroke.

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Background
Cardiac insult during acute vascular lesions of brain was acknowledged decades ago, however, we still don’t know which patients are at higher risk. For a better management, it is necessary to identify factors leading to this stroke complication. The purpose of the study was to identify factors associated with high risk of cardiac distress in patients presenting with acute stroke.

Material and methods
We prospectively evaluated 24 stroke patients, admitted in a Neurology Ward. Patient history, clinical findings, blood tests, cerebral CT scans and ECG Holter monitoring were the basic parameters studied. Also, we retrospectively studied 51 patients with negative outcome during the acute phase of stroke (death), in order to identify possible cardiac factors related to negative prognosis - electrocardiogram served as witness of cardiac involvement.

Results
The retrospective study identified an abnormal ECG in 88% of cases (T wave abnormalities - 43%, ST segment deviations - 39%, ventricular arrhythmia - 22%, atrial fibrillation - 49%, prolonged QTc - 43%) and acute cardio-vascular complications in 12% of patients (pulmonary edema, myocardial infarction). Using logistic regression we found that territory and type of stroke associated to presence of cardio-vascular risk factors and electrolyte abnormalities predicted the occurrence of AF. Also, type and localisation of stroke, prolonged QT interval, QRS axis deviation, electrolyte imbalance and acute myocardial damage predicted onset of ventricular arrhythmia.

Our prospective study identified stroke complications: ventricular arrhythmia (20 pts. from 24), atrial fibrillation (14 pts.) and prolonged QTc interval (10 pts.). Also, it confirmed the association of these cardiac complications with the risk factors highlighted by the retrospective study: hypertension, hemorrhagic stroke, insular cortex lesions.

Conclusions
Cardiac insult during acute phase of stroke may lead to negative outcome. Cardiac arrhythmias are the most common cardiac disorder in stroke and patients at high risk are those with hemorrhagic stroke, insular involvement and hypertension.
P33S

Patent Foramen Ovale Closure In Clinical Practice: Interim Analysis of a Multinational Survey

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Background: The recent publications of long-term outcomes from randomised controlled trials provide evidence of benefit for patent foramen ovale (PFO) device closure as compared with medical therapy in patients with cryptogenic stroke. We aimed to look at current practice on international level following recent publication of European position paper on management of patients with PFO.

Material and methods: An electronic questionnaire consisting of 24 questions was devised to identify practice in three core areas: patient screening, procedure and follow-up. Thirty-two responses were collected: 21 from the UK, 9 from Gulf Countries and 1 response from USA and Poland each; 81% were interventional cardiologists performing PFO closure and 19% were imaging cardiologists directly involved in PFO closure.

Results: Experience of ≥10 years in PFO closure procedures was declared by 69% of respondents. Screening for hypercoagulable disorders was not required by 19%, whereas the remainder screened for thrombophilia. 19% of cardiologists chose ILR to exclude AF in certain circumstances and 6% did not require prolonged ECG monitoring. 72% referred/performed PFO closure in a patient >60-year-old and 59% in a subject with a typical TIA, normal brain diffusion-weighted imaging and high risk features of PFO-related thromboembolism. Risk of Paradoxical Embolism (RoPE) Score was never used by 53%. Intraoperatively, ICE was available to 34% and 3D TOE to 53%. Following the procedure DAPT was prescribed for 1 month by 28% and up to 6 months by 69%. Thereafter, 63% of cardiologists recommended to continue single antiplatelet beyond 5 years. Post-procedural bubble study was not routinely repeated by 31%. Primary prevention PFO closure was performed by 22%. Referral/performance of PFO closure for platypnea-orthodeoxia syndrome, decompression sickness and migraine with aura was declared by 75%, 41% and 9%, respectively.

Conclusions: The survey demonstrates large differences in clinical practice, whilst showing good compliance with key expert recommendations.
P34S

Patients with history of stroke and myocardial infarction in clinical practice: demographic, clinical characteristics, drug treatment and outcomes (stroke registry data).

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Aim. To assess characteristics, treatment and outcomes in stroke (STR) patients with/without history of myocardial infarction (MI) based on STR registry.

Methods. 1886 patients with STR were enrolled in the registry. 356 patients had history of MI (STR+MI group) and 1530 - no history of MI (STR group). The incidence of cardiovascular diseases (CVD), drug therapy and outcomes were analyzed.

Results. The age of patients in STR+MI and STR groups was 73.2±10 and 70.3±10.6 years; p<0.05. Men (74.2%) prevailed in STR+MI group, women (61.2%) - in STR group. STR+MI patients more often had: arterial hypertension (AH) - 99.1% and 94.2%; coronary heart disease (CHD) - 100% and 57%; chronic heart failure (CHF) - 61.5% and 41.8%; atrial fibrillation (AF) - 42.7% and 23.8%; history of previous stroke - 32.9% and 18.9%, p<0.0001. In compared groups: 16.2% and 23.7% (p=0.10) were smokers; 3.2% and 1.2% (p=0.01) had a family history of premature CVD; 47% and 59.7% (p<0.001) - hypercholesterolemia. Administration of proven effective drugs was higher in STR+MI patients (47.1% and 40%), but insufficient in both groups: anticoagulants in AF - 19.1% and 21.4% (p=0.55); antiplatelets in CHD without AF - 69.4% and 42% (p<0.001); statins in CHD - 26.4% and 17.2% (p<0.001); beta-blockers in CHF - 39% and 23.8% (p=0.002). During 4-year follow-up in STR+MI group compared with STR group were significantly higher: all-cause mortality - 44.9% and 26.8%, p<0.001; nonfatal STR - 13.7% and 5.6%, (p=0.0001); nonfatal MI - 6.9% and 1.0%, (p<0.0001).

Conclusion. The rate of patients with history of MI was 18.9%. Patients in STR+MI group were older, more comorbid, had higher all-cause mortality and incidence of nonfatal STR and MI. Administration of proven effective drugs was insufficient, especially statins and anticoagulants in AF. Hence, these patients require special attention in order to improve the efficiency of secondary prevention.
P35S

**Efficacy and safety of DOACs and warfarin as part of multicomponent antithrombotic therapy**

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**Background:** The PIONEER AF-PCI, REDUAL-PCI, and AUGUSTUS studies have shown a significant DOACs benefit compared to warfarin in multicomponent antithrombotic therapy regarding bleeding risk. The limitations of these studies (INR level 2.0-3.0, TTR level, reduced DOAC dose in PIONEER trial) are questionable. The aim of our study is estimate efficacy and safety of DOACs and warfarin as part of multicomponent antithrombotic therapy in patients managed in anticoagulation clinic.

**Materials and Methods:** In our study we selected 162 patients (81 received DOACs and 81 warfarin) with AF and stable CAD in need of multicomponent antithrombotic therapy by propensity score matching analysis. The criteria for pair formation were CHA2DS2-VASc, HAS-BLED scores, and Charlson comorbidity index. The mean age was 67.2±7.6 years, 126 were males, median CHA2DS2-VASc score=4, median HAS-BLED score=3, index Charlson=6. In DOACs patients 50.6 % reduce dose. In warfarin patients INR level was 2.0-2.5, median TTR was 67.0%. Median follow up period=12.0 month. Efficacy composite endpoint included: myocardial infarction, ischemic stroke, venous thrombosis and cardiovascular death. Safety endpoint included bleeding BARC types 2-3. We used Kaplan-Meier analysis to compare event-free curves in patients treated with DOACs and warfarin (logrank-test).

**Results:** Kaplan-Meier curves demonstrated absence of significant difference in BARC 2-3 bleedings free survival between the patients with DOACs or warfarin (p=0.3186) and in thrombotic events (p=0.2381). Reduced dose of DOACs was associated with significant lower thrombotic free survival versus full doses DOACs (78.05% and 95.00% respectively, log-rank test p=0.0401), or warfarin with TTR level≥65% (78.05% and 92.00% respectively, log-rank test p=0.0229). Three cases of fatal ischemic stroke was observed, and all at the reduced DOACs doses.

**Conclusions:** Reduction of DOACs doses as part of multicomponent antithrombotic therapy leads to increased risk of thrombotic events, but comparable with full DOACs doses or warfarin bleeding risk in patients managed in anticoagulation clinic.
P36S

The future of diagnosing syncope with microRNAs as novel biomarkers

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BACKGROUND: Syncope is a common problem challenging physicians. We evaluated 3 circulating micro-RNAs and 3 vasoactive amine metabolites as possible biomarkers for early detection of syncope. To the best of our knowledge, this is the first study to assess the changes in miRNAs in syncope patients.

MATERIALS AND METHODS: Nineteen patients with history of syncope (Group A) and nineteen controls (Group B) participated. A detailed medical history was recorded followed by head up tilt table testing. Three blood samples were withdrawn, 1st at baseline, 2nd during syncope attack and 3rd after 30 minutes from the end of the test. The levels of three circulating microRNAs (miR-210, miR-1 and miR-34a) and three vasoactive amine metabolites (endothelin-1, copeptin and serotonin) were quantified using QRT-PCR analysis.

RESULTS: In Group A, copeptin significantly increased during syncopal attack by 21.7 ± 0.45 pg/mL vs 4.3 ± 1.209 pg/mL in control subjects (Group B; P= 0.002). Similarly, endothelin-1 values rose by an average of 28 ± 1.25 pg/mL in syncope patients versus 3.35 ± 0.75 pg/mL in healthy controls (P<0.001). While Serotonin (5-HT) levels were significantly greater during syncope relative to baseline in HUTT positive patients by 95.89 ± 3.7 pg/mL versus 9 ± 1.43 pg/ml (p<0.001) in control subjects.
Vasoactive amines increased with a 3-5 fold change in group A, but showed 1-2 fold increase in the control group.
In group A, miR-210 increased by mean of 0.6 ± 0.09(p<0.001) during syncope (95% CI [0.4, 0.79]). While miR-34a values increased by mean of 0.89 ± 0.22 during syncope than baseline value (95% CI [0.42, 1.36]) with significant difference of P =0.001. Likewise, miR-1 levels was elevated by an average of 0.42 ± 0.07 (95% CI [0.26, 0.58]), p<0.001.
miRNA levels were 3±1 fold higher in the syncope patients than in controls.

CONCLUSION: The selected miRNAs and vasoactive amines have a very promising role as biomarkers in diagnosing syncope.
The functioning of mitochondria from the leukocytes of patients with acute myocardial infarction and healthy volunteers.

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Aim: to evaluate the rate of oxygen uptake by mitochondria of patients with acute myocardial infarction and healthy volunteers.

Methods. The study included 21 patients with acute myocardial infarction (MI) and 17 healthy volunteers. Mitochondria were obtained from mononuclear cells by differential centrifugation in a sucrose medium. Studies were performed in a thermostabilized chamber with incubation medium (pH=7.35-7.4). The rate of oxygen uptake by mitochondria was determined by the polarographic method. The oxygen uptake rate was recorded when 200 μM ADP was added and after it was spent on ATP synthesis. The rate of oxygen uptake was presented in nM O2 per min per 1 mg of protein. In assessing the conjugation of oxidation and phosphorylation, an indicator of respiratory control was used. Comparison was performed using the Mann-Whitney test.

Results. In the presence of ADP, the oxygen absorption rate for mitochondria in patients with MI was lower than in the control group (p=0.033). But in the absence of ADP, no significant differences were found in the rate of oxygen consumption by the mitochondria in groups (p=0.070). The respiratory control in the group of patients with MI was 3.0 (3.0; 3.25), which corresponds to the lower boundary value of the norm (3-5 units). But in the group of healthy volunteers, the value of respiratory control was higher (p=0.012) and amounted to 3.3 (3.0; 3.5).

Conclusion. The mitochondria of patients with MI are characterized by a decrease in oxygen absorption rate and the level of conjugation of oxidation and phosphorylation processes relative to the group of healthy volunteers. The low level of conjugation between oxidation and phosphorylation in mitochondria reflects the less efficient of delivery systems of ADP and oxygen, the presence of which determines the possibility of synthesizing macroergic compounds.

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P38S

Histopathology of embolus after mechanical thrombectomy is a key to determining the cause of ESUS (case report)

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Background
Many of cryptogenic strokes are embolic with undetermined source (ESUS). There is increasing evidence that mild-to-moderate stenotic carotid plaque (<50%) may be the cause of ESUS. The histopathology of a clot after mechanical thrombectomy is an additional method to determine the relationship of a stroke with this type of carotid plaque.

Material and methods
A 52-year-old male with a history of coronary artery disease was admitted to coronary artery bypass grafting (CABG). On preoperative day 1, patient had an acute neurological decline: left-sided hemiplegia, neglect, dysarthria (National Institute of Health Stroke Scale score 18). Computed Tomography (CT) imaging revealed no early signs of infarct or intracerebral hemorrhage and CT angiography demonstrated occlusion of right middle cerebral artery (MCA). Intravenous thrombolysis was initiated. The patient was transferred to catheterization laboratory for mechanical thrombectomy (MT). The interventional team successfully performed a MT and complete reperfusion of the right MCA was achieved. Neurology follow-up on the same day also revealed dramatic neurological improvement with a NIHSS score 0. Control MRI showed 2 cerebral microinfarction. Echocardiography, electrocardiographic monitor, CT scan of the ascending aorta did not reveal the cause of the stroke. CT scan showed a 40% right internal carotid artery stenosis.

Results
In search of the cause of the ESUS, we performed a histopathology of the clot to determine its structure. It turned out to be a fragment of a plaque with a thrombus. Thus we considered non-stenotic carotid plaque as a cause of stroke. After 6 days, the patient underwent a synchronous carotid endarterectomy and CABG.

Conclusions
About 1 of the 5-6 ischemic strokes are ESUS. Determining the cause of a stroke is the key to successful secondary prevention. Histopathology of the clot after MT can be an important diagnostic sign to identify the cause of embolism.
P39S

Additive effects of aspirin and potent P2Y₁₂ inhibition on platelet macro- and microaggregation of relevance to acute thrombotic stroke

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Background: Aspirin and P2Y₁₂ inhibitors, such as ticagrelor, are co-prescribed in the treatment of atherothrombotic disease but not generally for acute stroke. The SOCRATES trial showed ticagrelor non-superior to aspirin; however, subsequent analysis suggested dual-antiplatelet-therapy (DAPT) in the peri-stroke period may confer benefits. THALES is assessing early-outcomes with ticagrelor-based-DAPT vs. aspirin. Assertions that aspirin has non-additive effects to P2Y₁₂ inhibition were based on low shear-stress assays. Effects on microaggregation remain undetermined. We investigated effects of aspirin +/- P2Y₁₂ inhibition using a gold-standard method with representative shear-stress conditions.

Material and Methods: Blood from 12 healthy-volunteers was incubated with aspirin (0, 1, 10, 100 μmol/L) for 30 minutes. Platelet-rich plasma was prepared. Macroaggregation was assessed by light transmittance aggregometry (LTA) using 1-mmol/L arachidonic acid (AA), 20-μmol/L adenosine diphosphate (ADP) and 2-μg/mL collagen as agonists. 1-μmol/L cangrelor, providing potent P2Y₁₂ inhibition, or vehicle, was added before aggregometry. Collagen-induced microaggregation was determined by single-platelet counting.

Results: Collagen-induced macroaggregation was inhibited by aspirin (p<0.0001) and cangrelor (p<0.0001). Even with concurrent P2Y₁₂ inhibition, aspirin concentrations of 1 (p=0.026), 10 (p<0.0001) and 100 μmol/L (p<0.0001) inhibited collagen-induced aggregation vs. no aspirin. Microaggregatory responses followed similar patterns, aspirin exhibiting an additive effect to cangrelor (p<0.0001). AA-induced maximum aggregation was inhibited by aspirin (p=0.0002) or cangrelor (p=0.0038). Inhibition was potentiated by adding aspirin to cangrelor (p=0.015), but not cangrelor in the presence of aspirin concentrations ≥10 μmol/L (all p>0.05). ADP-induced macroaggregation was significantly reduced by cangrelor (p=0.0017) with no additional effect of aspirin (p=0.11).

Conclusions: Aspirin potentiates the effect of P2Y₁₂ inhibition on collagen- and AA-induced platelet aggregation. In acute thrombotic stroke, platelets are exposed to large amounts of collagen and AA, hence our findings may help to explain why those patients exposed to both aspirin and ticagrelor in the peri-event period had better outcomes than single-antiplatelet-therapy, and provide mechanistic rationale for THALES.
Neuroprotection in rats by GLP-1 analogues – liraglutide and semaglutide

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Background
A substantial number of ischaemic stroke patients, who receive reperfusion therapy in the acute phase, do not ever fully recover. This reveals the urgent need to develop new adjunctive neuroprotective treatment strategies alongside reperfusion therapy. Previous experimental studies demonstrated the potential of glucagon-like peptide-1 (GLP-1) to reduce acute ischaemic damage in the brain. Here we examined the neuroprotective effects of two GLP-1 analogues, liraglutide and semaglutide.

Material and methods
A non-diabetic rat model of acute ischaemic stroke involved 90, 120 or 180 min of middle cerebral artery occlusion (MCAO) with a silicon-coated monofilament. Liraglutide or semaglutide were administered either i.v. at the onset of reperfusion, or s.c. 5 min before the onset of reperfusion. Infarct size and functional status were evaluated after 24 h or 72 h of reperfusion. Infarct size was measured using TTC staining, and expressed as percent of hemisphere volume corrected for oedema. Behavioural neurological evaluation was performed using 0-22 point scale.

Results
Liraglutide, administered as a bolus at the onset of reperfusion, reduced infarct size by up to 90%, and improved neuroscore at 24 hours in a dose-dependent manner, following 90-min, but not 120-min and 180-min ischaemia. Semaglutide and liraglutide administered s.c., reduced infarct size by 63% and 48% respectively, and improved neuroscore at 72 h following 90-min MCAO. Neuroprotection by semaglutide was abolished by GLP1-R antagonist Exendin(9-39).

Conclusion
Infarct-limiting and functional neuroprotective effects of liraglutide are dose-dependent. Neuroprotection by semaglutide is at least is strong as by liraglutide, and is mediated by GLP-1Rs.
Cardiac functional consequences of focal ischaemia in a rodent model

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Background. The cardiac functional consequences of ischaemic stroke are still need to be elucidated. We aimed at investigating left ventricular function using non-invasive and invasive modalities in a rat model of transient focal ischaemia.

Material and methods. Age-matched, young adult rats were used for this study. Serial left ventricular echocardiographic measurements and speckle-tracking analysis were performed in rats (n=9) underwent transient middle cerebral artery occlusion (MCAO) before, during and immediately after the induction of stroke, with a follow-up at 24, 48, 72 hours; 7, 11 and 14 days. In another experimental setting, 48 hours after stroke induction (MCAO group, n=9) we characterized left ventricular function by pressure-volume analysis, that was compared to sham-operated controls (Co group, n=10).

Results. Serial echocardiographic measurements showed impaired systolic function, that was most severe 48 hours after MCAO (global circumferential strain, GCS: -14.8±2.6% 48 hours after MCAO vs. -19.3±2.4% baseline, p<0.05). A complete recovery of systolic functional deterioration was observed after 14 days (GCS: -19.2±2.5% 14 days after MCAO vs. -19.3±2.4% baseline, n.s.). Heart weight (normalized to tibial weight) did not differ between MCAO and Co animals. Pressure-volume analysis revealed unaltered diastolic function and showed unchanged load-independent contractility index values (slope of end-systolic pressure-volume relationship, ESPVR: 2.56±0.29mmHg/µl MCAO vs. 2.55±0.59 mmHg/µl Co, n.s.) after MCAO.

Conclusions. Our data suggests that MCAO is associated with reversible impairment of systolic function during echocardiographic measurements, however without alteration of intrinsic myocardial contractility.

Key words: ischaemic stroke, cardiac function, speckle-tracking analysis, rat model.