Cerebrovascular diseases 4

PP4029

Prognostic factors for successful short term outcome (The Modified Rankin Score ≤2; mRS) after thrombolysis

M. Rakusa, M. Dzordzevic, M. Menih
Department of Neurology, University Medical Centre Maribor, Maribor, Slovenia

Introduction: Thrombolysis may be a successful treatment in acute stroke. However, it is not clear which factors have influence on outcome. With our study we wanted to identify prognostic factors for successful thrombolysis (mRS ≤2 after 3 months) in Slovenian population.

Methods: We divided 171 patients (80 women) in four groups according to mRS 3 months after thrombolysis. Means of age, onset to treatment time (OTT), baseline NIH Stroke Scale score (NIHSS), blood pressure (BP), glucose, creatinine, urea, cholesterol, triglycerides, low density and high density lipoproteins were compared using ANOVA.

Results: Three months after thrombolysis 50 patients had 1 or less on mRS (group 1), 30 had 2, 37 had 3 (group 3) and 54 had 4 or more. Means and standard deviations for prognostic factors were: age 65.4±11.1 years, OTT 152.7±44.9 minutes, NIHSS 16.2±5.8 points, systolic BP 152.6±19.6 mmHg, diastolic BP 87.6±14.1 mmHg, creatinine 88.7±29.2 µmol/l, glucose 7.3±2.7 low density lipoproteins 3.1±0.9 and high density lipoproteins 1.3±0.4 (all mmol/l). Haemorrhage occurred in 12 patients. Significantly predictive factors were age and NIHSS. Patients in group 1 and 2 were significantly younger (59.6±14.2 vs. 69.2±9.6 or 67.6±9.1 years) and less impaired before thrombolysis (13.55±5.8 vs. 17.2±4.8 or 18.6±5.4 points) than patients in group 3 and 4.

Conclusion: Thrombolysis was successful (mRS ≤2) in 80 patients (47%). The only significant predictive factors were age and baseline NIHSS. Although it is surprising to some extent that other risk factors didn’t show any predictive values, our results are similar to previous studies.

Disclosure: Nothing to disclose

PP4030

Bilateral carotid artery occlusion

S. Rusu 1, R. Bălașa 2, S. Maier 2, A. Moțățianu 2, O. Costache 2, Z. Bajko 2
1Neurology, Mures County Emergency Hospital, 2Neurology, University of Medicine and Pharmacy Târgu Mureș, Târgu Mureș, Romania

Introduction: The bilateral occlusion of the carotid arteries is a rare entity, there are only a few data in the literature regarding its epidemiology. The aim of the study was to analyse the prevalence of this rare vascular pathology and the clinical and diagnostic characteristics.

Methods: We analysed 5,000 cerebrovascular ultrasound records performed over a 7 year period (2006-2013). The examinations were carried out in the Ultrasound Laboratory of Neurology Clinic I, Târgu Mureș, Romania. The indication for ultrasound examination in the majority of cases was acute stroke (3,000/5,000 cases).

Results: 171 patients were diagnosed with carotid artery occlusion, 12 of them with bilateral carotid artery occlusion. 7 cases had bilateral ICA occlusion, 4 cases ICA occlusion+CCA or CCA+ICA occlusion controlaterally and only one case bilateral common carotid artery occlusion with patent distal vessels. 8 cases were symptomatic, from this 3 had major stroke, 5 minor stroke. 4 patients were asymptomatic (no stroke) and were examined for nonspecific symptomatic. The etiology in all cases was atherosclerosis. The mean age of the patients was 63.4±10.7 years. The males were more frequently affected (75%). The most important risk factors were: hypertension (100%), smoking (58.3%), dyslipidemia (50%) and peripheral vascular disease (33%). The diagnosis in the majority of cases was based only on ultrasound examination.

Conclusions: The prevalence of bilateral carotid occlusion is low (0.24%), is more frequent in males, the main etiological factor is atherosclerosis, an important number of cases could be asymptomatic.

Disclosure: Nothing to disclose
**PP4031**

**Outcome and disability of patients with intracerebral hemorrhage**

D. Salihovic Hajdarevic, D. Smajlovic  
Department of Neurology, University Clinical Center Tuzla, Tuzla, Bosnia and Herzegovina

**Introduction:** The aim of this study was to analyse outcome and disability of patients with intracerebral haemorrhage (ICH).

**Patients and methods:** This study included 75 patients with acute ICH, both sexes and all ages who were hospitalised at our Department during period from 01.06.2007 to 31.03.2008. Criterion of inclusion was ICH confirmed by computed tomography. We analysed neuroradiological characteristics (volume of hematoma, hematocerephalus and brain oedema) at the onset of ICH. The outcome was evaluated as survival and disability (Rankin Scale and Barthel index), and patients were tested after first, third and sixth month from ICH.

**Results:** Out of seventy-five patients, 40 were male (53.4%). Sixth months after onset 36 (48%) survived. Predictors of poor six-month outcome were brain oedema (p=0.002), blood spreading in ventricles (p=0.004) and Glasgow Coma Scale \( \leq 8 \) (p<0.0001). The best cumulative survival had patients with volume of hematoma up to 29ml, 64% have survived. The highest mortality rate had patients with hematoma greater than 60ml, only 15% of them survived in first 7 days. The number of patients with a lower level of disability increased from 28.5% after the first month to 61.1% after sixth months, and consequently reduced with higher level of disability (Rankin Scale >2) (p=0.03). More than half of patients who survived (61.1%) were functionally independent.

**Conclusion:** Brain oedema, intraventricular blood spreading, and large volume of hematoma adversely affect short-term outcome in patients with intracerebral hematoma. Six month after intracerebral hemorrhage more than 50% of patients were functionally independent.

**Disclosure:** Nothing to disclose

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**PP4032**

**Evaluation of inflammatory biomarkers and Ala16Val-MnSOD2 gene polymorphism in patients with chronic stroke**

E.T. Pascotini\(^1\), A.E. Flores\(^1\), A.L.C. Prado\(^1\), A. Kegler\(^1\), T.D. Algarve\(^1\), P. Gabbi\(^1\), R.S. Scalco\(^2,3\), I.B. Manica da Cruz\(^1\), M.F. Duarte\(^1\), L.F.F. Royes\(^1\), M.R. Fighera\(^1\)

\(^1\)Laboratorio de Neuropsiquiatria Experimental e Clinico, Universidade Federal de Santa Maria, Santa Maria, Brazil,  
\(^2\)UCL Institute of Neurology, London, United Kingdom,  
\(^3\)Neurology, PUCRS, Porto Alegre, Brazil

**Introduction:** The superoxide dismutase manganese dependent (MnSOD2) catalyzes O\(_2\) into H\(_2\)O\(_2\). It is encoded by a single gene with a common polymorphism which results in replacement of alanine (A) with valine (V) in codon 16. This polymorphism has been implicated in a decreased efficiency of MnSOD2 transport in targeted mitochondria in V allele carriers. Previous studies have described an association between VV genotype and neurological diseases, such as stroke. The exact mechanism of such associations is still unknown. The aim of this research is to investigate if the Ala16Val-MnSOD polymorphism could influence the inflammatory response in the patients with chronic stroke (CS).

**Methods:** We performed a cross-sectional study. CS patients (n=27) were compared to control group (n=30). Patients were evaluated by a questionnaire and blood exams - serum glucose (GLU; mg/dL), glycated hemoglobin (HBA1C; %), cholesterol (CHO; mg/dL), urea (mg/dL), phosphatase (PHO; UL/mL), acetylcholinesterase (ACHE; UL/mL), interleukin 1\(\beta\) (IL-1\(\beta\); pg/ml) and 6 (IL-6; pg/ml), tumoral necrosis factor (TNF-\(\alpha\); pg/ml) and interferon gamma (INF-\(\delta\); µg/ml). Ala16Val-MnSOD results were presented in mean (%). The level of significance was set at 5%.

**Results:** Patients with CS presented higher frequency of VV genotype (37% - control 6.6%) and higher serum levels of GLU (t=3.58), HBA1C (t=2.6), CHO (t=3.89), LDL (t=3.09) Urea (t=6.37), PHO (t=5.7), ACHE (t=6.7), IL-1\(\beta\) (t=12.03), IL-6 (t=8.5), TNF-\(\alpha\) (t=8.8) and INF-\(\delta\) (t=10) comparing to the control group.

**Conclusion:** Our results suggest that the Ala16Val-MnSOD polymorphism could influence the inflammatory response in patients with CS.

**Disclosure:** Nothing to disclose
**PP4033**

**Craniocerebral hypothermia in patients with malignant acute ischemic stroke**

V.I. Shmyrev¹, O.A. Shevelev², M.V. Tardov³, I.E. Kalenova¹, I.A. Sharinova⁴  
¹Neurology, Presidenttial Scientific Medical Center,  
²Pathophysiology, Peoples’ Frendship University of Russia,  
³Diagnostic Ultrasound, Scientific-Practical Centre of Otolaryngology, ⁴Stroke Unit, Presidental Hospital №1, Moscow, Russian Federation

**Introduction:** Therapeutic hypothermia is perspective course in management of ischemic stroke patients. Craniocerebral hypothermia (CCH) is the hypothermia variant with primary brain cooling. This method is noninvasive and doesn’t require profound sedation of patients. We studied CCH effect on neurological state and cerebral blood flow.

**Methods:** 30 patients (mean age 69±11.1, men 13, women 17) with malignant middle cerebral artery (MCA) ischemic stroke were treated by CCH and standard stroke management protocol; control group included 30 similar patients (mean age 68.8±12.3, men 13, women 17). Including criteria was acute ischemic stroke National Institutes of Health Stroke Scale (NIHSS) score >16 points. Excluding criteria was bradycardia. We used the therapeutic hypothermia helmet device for CCH and the ultrasound Doppler analyzer for recording the MCA cerebral blood flow velocity. Patients were treated with 2 CCH procedure (12±3.3 hours). Neurological state (NIHSS), hemodynamic parameters, and tympanic temperature were studied before and after CCH. Intracranial pressure calculation was based on MCA mean blood flow velocity and BP data (Klingelhofer method).

**Results:** We observed significant regress of the neurological deficit (36.4%) in hypothermia group. MCA mean blood flow velocity increased in hypothermia group (65%). Tympanic temperature significantly declined from 37.2±0.72°C to 34.7±0.82°C. Intracranial pressure decreased in patients with brain edema.

**Conclusions:** Craniocerebral hypothermia promotes regression of the neurological deficit, increasing of the cerebral blood flow velocity and decreasing of the intracranial hypertension.

**Disclosure:** Nothing to disclose

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**PP4034**

**Cannabis: a considerable cause of ischemic stroke in young adults**

S. Smaoui¹,², V. Sudacevschi², M.L. Chadenat², F. Pico²  
¹Neurology, Habib Bourguiba University Hospital, Sfax, Tunisia, ²Neurovascular Intensive Care Unit, Andre Mignot Hospital, Le Chesnay, France

**Introduction:** A large part of unexplained strokes could be linked to illegal drug abuse and 10% are estimated to be directly linked to illegal drugs in some international studies. Cannabis is the most consumed illicit drug suspected to have an important role in neurovascular diseases.

**Case report:** We report a case of a 42-year-old man who has presented suddenly a right neurological regressive palsy without headache, nausea, vomiting or blind trouble. The patient reported cannabis consummation 6 hours and a half before the onset of symptoms. Neurological exam was normal. Brain MRI objectified a left frontal ischemic stroke. There were no arguments for an infectious or inflammatory vasculitis. Cerebrospinal fluid (CSF) examination was normal. Toxic research in urine was positive for cannabis. MRI angiography cerebral revealed irregularities of vascular walls in favor of reversible vasoconstriction syndrome.

**Discussion:** A reversible cerebral angiopathy secondary to cannabis consummation is a frequent cause of stroke in young adults. In our case, we incriminate cannabis as a cause of stroke because of the temporal relationship between the intake of this drug and the occurrence of cerebral infarction. The combination of vasoconstriction and orthostatic hypotension caused by cannabis could be the cause of cerebral infarction.

**Conclusion:** The relationship between stroke and cannabis consummation is strongly suspected, which justifies further questioning and a precise cerebral arterial imaging.

**Disclosure:** Nothing to disclose
PP4035
When we don't prescribe anti-coagulants after cardioembolic strokes due to auricular fibrillation
S. Sousa, F. Pita, C. Carmona, R. Guerreiro
Hospital de Cascais, Cascais, Portugal
Introduction: Atrial fibrillation (AF) contributes for approximately 10-20% of all strokes, and its prevalence increases with age. The decision for anticoagulation is a challenge, especially in the group of older patients. We purpose to estimate the prevalence of patients with cardioembolic stroke due to AF undergoing oral anticoagulation, and assess the main reasons for non-anticoagulation in the remaining patients.
Methods: We conducted a retrospective study including patients hospitalized with cardioembolic stroke due to AF from November 1st 2012 to October 31st 2013. Descriptive analysis of anticoagulated and non anticoagulated groups was performed.
Results: Among 276 patients admitted with diagnosis of ischemic stroke, 29% (n=80) are cardioembolic due to AF. Mean age was 80.58±8.72 years and 60% were women. The majority were previously autonomous, 40% with newly diagnosed AF and 60% with known AF. Of these, 77.1% were not anticoagulated, with CHA2DS2-VASc score 5 on average. Most of anticoagulated patients before stroke, had subtherapeutic INR. At discharge, the mean of mRS score was 3.13±1.5. Anticoagulant therapy was prescribed in 55%. Older patients, those with high risk of falls or high NIHSS and mRS scores were less likely to receive anticoagulant therapy. 15.38% of patients with significant functional disability (mRS>3) were anticoagulated. Only the patients functional status was independently associated with the decision of not prescribe anticoagulants (OR 19.33; IC 2.74-136.2; p=0.03).
Conclusions: In our study, high prevalence of cardioembolic stroke due to AF was found. A greater functional dependence raises the probability of non-anticoagulation at discharge.
Disclosure: Nothing to disclose

PP4036
Clinical and radiological predictors of poor outcome in patients with cerebral venous thrombosis
Neurology Clinic, Clinical Centre of Serbia, School of Medicine, University of Belgrade, Belgrade, Serbia
Introduction: Cerebral venous thrombosis (CVT) is a rare cerebrovascular disease that usually affects young to middle aged people. Although prognosis is usually favorable and the mortality rate is relatively low, the outcome can be very unpredictable. In this study, we aimed to determine the clinical and radiological predictors of poor outcome in patients with CVT.
Methods: This is a retrospective study conducted from January 2007 to June 2013 on patients diagnosed with CVT at Neurology Clinic in Belgrade. We analyzed the associations of demographic factors, risk factors, and the clinical and radiological characteristics of CVT with poor outcome at discharge, which was defined as death or dependency (mRS >3).
Results: Of the 48 patients, 17 were males and 31 were females with a mean age of 42 years (range 18 to 78 years). The poor-outcome group included 11 patients (23%); seven of which (14.6%) were severely handicapped (mRS=4 or 5) and four (8.3%) died. The univariate analysis identified factors related to poor outcome: development of coma within 72 hours of the disease’s onset (p=0.002), NIHSS on admission (p=0.001), parenchymal lesion on initial imaging (p=0.043), thrombosis of the deep cerebral venous system (p=0.037) and malignancy (p=0.004). In the multivariate analysis, NIHSS on admission and malignancy were significantly associated with a poor outcome.
Conclusions: These predictors of poor outcome can be used to define a subgroup of CVT patients who require close monitoring and more aggressive therapy.
Disclosure: Nothing to disclose
**PP4037**

**The value of juxtaluminal carotid plaque echodensity in the development of cerebrovascular manifestations**

T.J. Tegos¹, G. Stefanou², A. Petrakis¹, A. Valavanis¹, A. Safouris¹, K. Notas¹, A. Papadimitriou¹, A. Delopoulos², A. Orologas¹

¹Neurology Department, AHEP A Hospital, ²Department of Electrical and Computer Engineering, Aristotelian University, Thessaloniki, Greece

**Introduction:** It has been demonstrated that symptomatic carotid plaques are echolucent on ultrasound, whereas asymptomatic ones echogenic. The aim of this study was to determine whether the juxtaluminal plaque echodensity constitutes a better discriminator of symptomatic and asymptomatic status, as compared to global plaque echodensity.

**Methods:** Analysis included imaging by duplex of 102 carotid plaques of more than 50% stenosis (90 patients, 51 symptomatic and 51 asymptomatic plaques), capturing, digitisation and normalisation in a computer. The global plaque Grey Scale Median (GSMglobal) was evaluated semi-automatically in a computer software to distinguish dark (low GSM) from bright (high GSM) plaques. Subsequently, in the same software the juxtaluminal 25% plaque area GSM (GSMjl25%) was automatically calculated. Stenosis was evaluated on duplex.

**Results:** Symptomatic plaques were associated with median GSMglobal of 7 whereas the asymptomatic ones of 26 (p=0.0001). The corresponding values for median GSMjl25% were: 0 for symptomatic plaques and 29 for asymptomatic ones (p=0.0001). ROC curves demonstrated a more adequate ability of GSMjl25% over GSMglobal in separating symptomatic from asymptomatic plaques (difference between areas: 0.104, p=0.003). Median stenosis for the symptomatic plaques was 85% and for the asymptomatic ones 75% (p=0.065).

**Conclusions:** Our results suggested that juxtaluminal 25% plaque echodensity proved to be a more adequate index, compared with global plaque echodensity, in the separation of symptomatic and asymptomatic carotid plaques. This position might be solidified in natural history studies of asymptomatic individuals with carotid plaques, with stroke as an exit point.

**Disclosure:** Nothing to disclose

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**PP4038**

**Peculiarities of cerebellar motor syndrome in acute isolated infarctions of the cerebellum**

G. Trepet¹, O. Mialovitska²

¹National O.O. Bogomolets Medical University, ²Neurology, National O.O. Bogomolets Medical University, Kiev, Ukraine

**Introduction:** Cerebellar motor disorders are one of the most frequent clinical manifestations that restrain functional abilities or lead to patient’s disability after cerebellar infarction.

**Objective:** To examine specific symptoms of cerebellar motor syndrome in patients with acute isolated infarction of the cerebellum and to assess peculiarities of restoration of functions according to affected vascular territory.

**Material and methods:** 31 patients (21 men and 10 women, mean age 57.1±13.9) after acute isolated infarction were examined by neurological scales (ICARS, NIHSS, mRS, Barthel Index) on admission, on the 7th, 14th and 21st day; brain MRI.

**Results:** MRI showed infarctions of SCA in 16 patients, PICA- in 12, AICA- in 3. Volume of motor deficit in patients with infarction of PICA was 74.8±3.96 and manifested with vertigo, gait ataxia, nystagmus; in the territory of SCA was 46.3±3.18 and characterized by dysarthria, limb ataxia, dysmetria; and in the territory AICA was 18.0±3.41 and characterized by vertigo, vestibular disturbances, nystagmus. On the 7th day of treatment full recovery of motor functions was seen in 25% of patients (p<0.01), on the 14th day - in 40% and on the 21st day - in 85% of cases (p<0.001).

**Conclusion:** Peculiarities of cerebellar motor syndrome after acute isolated infarction of the cerebellum depended on involved vascular territories; restoration of motor functions was seen after 2 weeks in the territory of SCA and AICA, but some patients had ataxic signs and needed rehabilitation.

**Disclosure:** Nothing to disclose
PP4039

Successful 5 years of intravenous thrombolysis in the University Hospital Dubrava

V. Vojnovic, V. Vuletic, M. Rubinic Majdak, A. Glasnovic, S. Basic
Department of Neurology, University Hospital Dubrava, Zagreb, Croatia

Introduction: It has been 5 years since University Hospital Dubrava introduced intravenous thrombolysis for treatment of acute stroke; we now evaluate our results during that period.

Methods: All patients who received intravenous thrombolytic therapy as treatment of acute stroke from December 2008 to September 2013 were included in our evaluation; total of 134 patients, 67 men and 67 women. We gathered all medical records, time aspects, short and long-term clinical results and complications and compared the data with other SITS register data and published studies.

Results: Initial median NIHSS score of our patients was 10.0. We are proud to present our intravenous thrombolysis treatment results: 70% of our patients had significant early improvement, in comparison to only 56% in all SITS centers. 73% of our patients had much better 7 day global outcome, in comparison to only 43% in all SITS centers. 3 months after rt-PA treatment 71% of our patients were functionally independent (mRankin 0-2), in comparison to 55% in all SITS centers, high 57% of our patients were with excellent recovery (mRankin 0-1), in comparison to only 40% in all SITS centres. We also evaluate our patients with poorer outcomes: 5% of patients treated with intravenous thrombolysis had SICH RCT. 16 patients (12%) died, only 2 due to symptomatic intracerebral hemorrhage.

Conclusions: Intravenous thrombolysis with rt-PA in treatment of acute stroke in University hospital Dubrava has proven to be safe and highly efficacious method of treatment. Our excellent results prompt us to do even better in future.

Disclosure: Nothing to disclose

PP4040

Intracerebral hemorrhage as the most common cause of brain death in the context of cadaveric organ transplantation

N. Vukasinovic, S. Jolic, V. Milosevic, G. Djordjevic, M. Cvejic, M. Zivkovic
Clinical Center Nis, Clinic of Neurology, Nis, Serbia

Due to a more consistent application of the Regulation on Reporting Patients in the State of Brain Death and precise Protocol of Clinical Center Nis /which minutely describes procedures in twelve phases, as well as performance time, people in charge of performance, with checking all the steps performed/ in the period of one year, and with the help of precise instrumental methods, brain death was confirmed in twenty patients, all of them being diagnosed with intracranial hemorrhage. Processing the patients with brain death is a standardized process conducted at the Clinic of Neurology and Clinic of Neurosurgery. Based on the insight into the electronic patient registry of the Clinic of Neurology for the year 2013, it has been confirmed that there were 948 patients with the diagnosis of brain death. Out of 948 patients, 143 were treated for ICH (67 women and 76 men, mean age 64.63±11.49 years). Brain death was confirmed in twenty patients, and there were discussions held with ten relatives, seven of whom gave consent to transplantation. 13 cadaveric kidney transplants were performed in Clinical Center Nis in 2013.

Disclosure: Nothing to disclose
The usefulness of DWI/FLAIR imaging in timing of stroke

G. Witkowski1, A. Piliszek2, H. Sienkiewicz-Jarosz1, R. Poniatowska1, A. Skierczyńska1, G. Makowicz3, D. Ryglewicz1, J. Walecki4
1Ist Department of Neurology, Institute of Psychiatry and Neurology, 2Department of Radiology, Central Clinical Hospital of the Ministry of Interior, 3Department of Radiology, Institute of Psychiatry and Neurology, 4Mossakowski Medical Research Centre Polish Academy of Sciences, Warsaw, Poland

Introduction: Patients admitted within 4.5 hours from stroke onset are candidates for reperfusion. However in wake-up strokes it is impossible to determine the time of onset. It would be useful to find a radiological marker reliable in timing of stroke. One candidate is the DWI/FLAIR mismatch: the presence of hyperintensive signal in MR DWI without relevant change in FLAIR. The goal was to assess if the DWI/FLAIR can help to identify patients with acute ischemic stroke within 4.5 h from onset.

Methods: This retrospective study was performed with use of the data of 85 patients admitted with ischemic stroke of known onset. Patients were imaged with MR protocol composed of DWI and FLAIR. The presence of lesions in applied imaging modalities was assessed in light of the time, type and severity of stroke.

Results: The time from stroke onset was significantly shorter for patients with the ischemic lesion only in DWI (2.25h (range 1.5-7 hours, n=34), when compared to patients with signs of ischemia in both modalities (range 2.2-18 hours n=51) (p=0.005, Kruskall Wallis ANOVA). The DWI/FLAIR characterized with global sensitivity 58%, specificity 97.5%, PPV 94.7% and NPV 75.4% in identification of patients in 4.5 h time window. For lacunar strokes (n=22) these parameters were as follows: sensitivity 50%, specificity 90.2%, PPV 75% and NPV 77%.

Conclusions: The presence of acute ischemic lesions only in DWI can identify patients with both lacunar and nonlacunar ischemic stroke, who are in 4.5-time window for intravenous thrombolysis with high specificity and PPV.

Disclosure: Nothing to disclose

Cardiac investigation in ischemic stroke patients

Y. Karamanlı, V. Yayla, A. Çulha Oktar, M. Çabalar, Y. Kayran
Neurology, Bakirköy Sadi Konuk Research and Education Hospital, Istanbul, Turkey

Objective: Up to 15-30% of ischemic strokes are caused by cardiac sources of emboli being associated with poor prognosis and high index of fatal recurrence. In recent studies, left atrial volume is increased in cardioembolic strokes. In this study, electrocardiography (ECG), transthoracic (TTE) and transesophageal echocardiography (TEE) findings were evaluated for cardioembolic risk factors.

Materials and methods: The data of 502 acute ischemic stroke patients who were admitted to our clinic in three years period, between January 2010 and January 2013, were analyzed. The causes of ischemic stroke were classified according to TOAST criteria. Demographic variables including age and gender, history or evidence of diabetes mellitus, hypertension, dyslipidemia, ischemic heart disease, atrial fibrillation, congestive cardiac failure, previous stroke, and tobacco use were recorded. ECG and TTE findings were analyzed.

Results: The mean age of 502 patients was 60.8±14.9 years (18-90 years) and 42.4% (n= 213) of them were female, 57.6% (n=289) male. According to TOAST classification, common subtypes were large artery atherosclerosis (%46) and cardioembolism (40.4%). Cardioembolic stroke patients had a higher proportion of left ventricular segmental or global hypokinesia (44.9%), atrial fibrillation (34.5%) and left ventricular ejection fraction less than 40% (25.7%). ECG and TTE showed 46.8% high risk and 53.2% intermediate risk for cardioembolic stroke. Patients with cardioembolic stroke had increased left atrial volume (43.6%) compared to the other stroke subtypes.

Conclusion: In this study, cardioembolic risk factors were similar to the literature and left atrial volume indices may also be linked to cardioembolic stroke.

Disclosure: Nothing to disclose
PP4043
Abstract withdrawn

PP4044
Characteristics of patients with transient global amnesia: data from the Evangelismos Stroke Registry
P. Zis, P. Leivadeas, L. Zikou, A. Tavernarakis
Department of Neurology, Evangelismos General Hospital, Athens, Greece

Introduction: Transient global amnesia (TGA) is a clinical syndrome of reversible anterograde amnesia accompanied by repetitive questioning, with an unknown etiology. We aimed to describe the characteristics of patients with TGA admitted in Evangelismos Hospital, a tertiary hospital in Athens, Greece.

Methods: We looked into data of all relevant patients, over a period of 3 years. Demographic and clinical characteristics were recorded.

Results: Between 01/2011 and 12/2013, 34 (21 female, 13 male) were diagnosed with TGA. Their mean age was 60.1±6.2 yrs (range 34-69, median 60, mode 60 yrs). Four patients (11.8%) had experienced another episode of TGA in the past. The mean duration of the current episode was 4.6±2.7 hrs (range 1-12, median 4, mode 5 hrs). Six patients (17.6%) reported a stressful event prior to the TGA. Vascular risk factors included smoking (17.6% of the patients), diabetes (2.9%), hypertension (52.9%), coronary disease (5.9%), atrial fibrillation (2.9%), dyslipidemia (73.5%), sleep apnea (5.9%) and alcohol abuse (8.8%). Interestingly, 7 patients (20.6%) had a history of an anxiety disorder and 3 patients (8.8%) had a history of cancer. Electroencephalography (EEG) was performed on all patients shortly after the resolution of the TGA symptoms. Only one EEG (2.9% of patients) showed paroxysmal epileptiform activity. Nine patients (26.5%) showed paroxysmal non-specific theta activity (1 diffuse, 2 in frontotemporal and 6 in temporoparietal regions).

Conclusion: Our results are concordant with most registries in which TGA occurs in middle to older aged patients, who also show various vascular risk factors. Dyslipidemia is the most common risk factor, followed by arterial hypertension. A female predominance (2:1) and a high percentage of comorbid anxiety disorders are also highlighted. Although the majority of patients had EEG within normal limits, a fourth of them showed paroxysmal non-specific theta activity mainly in the temporoparietal regions.

Disclosure: Nothing to disclose
PP4045
Gender differences of risk factors of ischemic stroke
A. Fazliakhmetova, E. Bogdanov
Kazan State Medical University, Department of Neurology and Rehabilitation, Kazan, Russian Federation

PP4046
Bilateral septic internal jugular vein thrombosis
H. Felgueiras¹, P. Barros¹, T. Santos¹, M. Bastos², M. Sousa², M. Correia³, T. Soares-Silva¹, J. Pinheiro¹
¹Neurology, ²Internal Medicine, ³Intermediate Care Unit - Internal Medicine, Centro Hospitalar de Vila Nova de Gaia/Espinho, Vila Nova de Gaia, Portugal

PP4047
Bilateral subclavian steal syndrome: a case report
L. Friedrich, H. Budinčević, N. Tolj-Karaula, N. Marić, T. Sučić, I. Bielen
Sveti Duh University Hospital, Zagreb, Croatia

PP4048
Abstract withdrawn

PP4049
Severity and duration of hypertension and the outcome of ischemic stroke
Y. Geletyuk, T. Cheren’ko
Neurology, National O.O. Bogomolets Medical University, Kiew, Ukraine

PP4050
Assessment of D-dimer in stroke patients at 1 year in Tehran University affiliated Hospital
S. Parviz¹, M. Ghabae², M. Pourashraf³, R. Shahsiah³, M. Ghaffarpour³, S. Mohbabi⁴, Z. Zeynali Kahaki⁵, H. Sadeghian⁶, A. Meysamie⁷
¹Department of Neurology, ²Department of Neurology, ³Iranian Center of Neurological Research, Neutoscience Institute, ⁴Department of Pathology, ⁵Iranian Center of Neurological Research, ⁶Department of Community Medicine, Tehran University of Medical Sciences, Tehran, Iran, Islamic Republic of

PP4051
Capabilities of ADP and collagen-induced light-transmission aggregometry for the estimation of platelet function against the background of antiplatelet therapy in ischemic stroke
J.I. Stepanova¹, I.A. Gontschar²
¹Department of Clinical Laboratory Diagnostics, Belarusian Medical Academy of Postgraduate Education, ²Neurological Department, Republican Research and Clinical Center of Neurology and Neurosurgery, Minsk, Belarus

PP4052
Cerebral venous sinus thrombosis associated with iatrogenic intracranial hypotension: presentation of 2 cases and literature review
V. Parkhutik¹, R. Klee¹, M. Nedelmann², T. Niehoff², J. Valdueza¹
¹Neurologisches Zentrum, Bad Segeberg, ²Regio Kliniken, Pinneberg, Germany

PP4053
Cerebrovascular disease developed on the background of pathological tortuosity of cerebral vessels in young people
Y.R. Parpiyeva, K.M. Khalimova, M.M. Yakubova, N.S. Rashidova
Tashkent Medical Academy, Tashkent, Uzbekistan
PP4054
Abstract withdrawn

PP4055
Immunomodulatory effect of brain derived low-molecular polypeptide fraction in patients with early post-stroke depression
A. Payenok, B. Zadorozhna, O. Kukhlenko, R. Kukhlenko
Neurology and Neurosurgery, Lviv National Medical University, Lviv, Ukraine

PP4056
Abstract withdrawn

PP4057
Atherosclerotic lesion of carotid arteries in young patients
D. Druzhinin, N. Pizova
Department of Neurologist and Neurosurgery, Yaroslavl State Medical Academy, Yaroslavl, Russian Federation

PP4058
Cervical dystonia as a complication after stroke – case presentation
M. Sabau1, A. Badea2, M. Silaghi3, I. Popa3
1Neurology, University of Oradea, 2Neurology, County Emergency Clinical Hospital Oradea, Oradea, 3University of Medicine and Pharmacy ‘Carol Davila’, Bucharest, Romania

PP4059
Pseudoperipheral facial paresis as a rare variant of acute ischemic stroke
G. Pryanishnikova, N. Skripkina, O. Levin
Russian Medical Academy of Postgraduate Education, Moscow, Russian Federation

PP4060
Risk of thromboembolic stroke in elderly patients with non-valvular atrial fibrillation
D. Radu, C. Roman-Filip
Neurology, Emergency County Hospital Sibiu, Hermannstadt, Romania

PP4061
Clinical and computer tomographic comparisons in patients with stress hyperglycemia in acute period of hemispheric cerebral ischemic stroke
K. Ruban, O. Kozyolkin
Zaporizhzhya State Medical University, Zaporizhzhya, Ukraine

PP4062
Unilateral hypoplastic vertebral arteries and stroke territories: a retrospective analysis in Italian patients
D. Sangalli1,2, B. Corrà3, A. Doretti3,4, G. Bilo4, L. Lonnati4,5, L. Adobbati5, V. Silani1,6
1Neurology and Stroke Unit, Laboratory of Neuroscience, IRCCS Istituto Auxologico Italiano, 2Neurology, Università degli Studi di Milano, 3Neurology and Stroke Unit, 4Cardiology, IRCCS Istituto Auxologico Italiano, 5Cardiology, Università degli Studi di Milano - Bicocca, 6Pathophysiology and Transplantation, Dino Ferrari Center, Università degli Studi di Milano, Milan, Italy
PP4063
Encephalopathy resulting from dural arteriovenous fistula
A.F. Santos1, C. Machado1, S. Varanda1, J. Pinho1, M. Ribeiro2, J. Rocha2, R. Mário1
1Neurology Department, 2Neuroradiology Department, Hospital de Braga, Braga, Portugal

PP4064
Hypertrophic olivary degeneration and cerebrovascular disease: movement in a triangle
A.F. Santos1, S. Rocha1, S. Varanda1, J. Pinho1, M. Rodrigues1, J. Ramalho Fontes1, J. Soares-Fernandes1, C. Ferreira1
1Neurology Department, 2Neuroradiology Department, Hospital de Braga, Braga, Portugal

PP4065
Risk factors affecting recurrent stroke after transient ischemic attack and their importance in predicting stroke development
M. Korucuk, U. Sener, Y. Zorlu
Neurology, Tepecik Educational and Research Hospital, Izmir, Turkey

PP4066
Peripheral blood T-lymphocytes count may be associated with ischemic stroke outcome
E.K. Sidorovich1, S.A. Likchachev1, M.P. Potapnev2, N.V. Goncharova2, U.S. Shabalina1, I.A. Petrovich3
1Clinical Neurology, Republican Research and Clinical Center of Neurology and Neurosurgery, 2Belarus Research Center of Transfusiology and Medical Biotechnologies, 3Belarus Research Center of Transfusiology and Medical Biotechnologies, 4Emergency Hospital, Minsk, Belarus

PP4067
Combination of statin and inosine pranobex has anti-inflammatory, immunomodulatory effect and improves functional outcome in patients with acute ischemic stroke. A pilot study
E.K. Sidorovich1, S.A. Likchachev1, N.V. Goncharova2, M.P. Potapnev3, U.S. Shabalina1, I.A. Petrovich4
1Clinical Neurology, Republican Research and Clinical Center of Neurology and Neurosurgery, 2Belarus Research Center of Transfusiology and Medical Biotechnologies, 3Belarus Research Center of Transfusiology and Medical Biotechnologies, 4Emergency Hospital, Minsk, Belarus

PP4068
Gamma-delta T-lymphocytes are reduced after ischemic stroke in a Polish population
M.-V. Siwoski1, A. Kharabi1, M.G. Adamski1,2, N. Kachamakova-Trojanowska1, A. Slowik1, A.E. Baird2
1Department of Neurology, Jagiellonian University Medical College, Krakow, Poland, 2Department of Neurology, SUNY Downstate Medical Center, Brooklyn, NY, United States, Jagiellonian Centre for Experimental Therapeutics (JCET), Jagiellonian University, Krakow, Poland

PP4069
Paroxysmal dysphonia caused by an aortic arch aneurysm
A. Dulamea, A. Buture, E.A. Solomon
Neurology, Fundeni Clinical Institute, Bucharest, Romania

PP4070
Acute hemiparesis without cognitive symptoms: Creutzfeldt Jakob disease?
A. Sonderen van1, E. Granneman2, S.F.T.M. Bruijn de2
1Neurology, Haga Teaching Hospital, Leiden, 2Haga Teaching Hospital, The Hague, Netherlands
PP4071
Treatment in the acute phase and pharmaceutical prophylaxis in a patient with an antiphospholipid syndrome associated M1-occlusion
K. Stadler1, G. Kalss1, J. Sellner1, A.R. Al-Schameri2, J.S. Mutzenbach1
1Department of Neurology, 2Department of Neurosurgery, Christian Doppler Klinik - Paracelsus Privatuniversität - Landesnervenklinik Salzburg, Salzburg, Austria

PP4072
Artery of Percheron: an anatomical variation as an unusual cause of coma
A. Stratogianni, G. Haas, S. Isenmann
Department of Neurology, Helios Klinikum Wuppertal, University of Witten/Herdecke, Wuppertal, Germany

PP4073
Case report: lethal progressive bilateral stroke of the posterior circulation - primary CNS angiitis or vasoconstriction syndrome?
B. Surboeck1, O. Berger1, L. Alpaslan1, B. Horvath-Mechtler2, J. Hainfellner1, A. Wöhrer1, W. Grisold1
1Neurology, 2Radiology, Kaiser Franz Josef Hospital, Vienna, Vienna, Austria

PP4074
Bilateral medullary syndrome: report of a challenging case
O. Taskapilioglu1, B. Hakyemez2, S.E. Ozbek1, M. Zarifoğlu1
1Neurology, 2Radiology, Uludag University Medical Faculty, Bursa, Turkey

PP4075
Basal ganglia hemorrhages and functional outcome: a proposed classification
F.R. Ugdamina, J.C. Navarro
Neurology, Jose Reyes Memorial Medical Center, Manila, Philippines

PP4076
Demographical, etiological, clinical and radiological evaluation of 31 cerebral venous thrombosis patients
S. Ulutas1, V.A. Yayla1, M. Çabalar2, A. Çalış Oktar1, Ö. Yarka2
1Neurology, 2Bakırköy Sadi Konuk Research and Education Hospital, Istanbul, Turkey

PP4077
A case report of cerebrovascular disease in a young person due to abuse of synthetic cannabinoids called “Bonzai”
F. Un Candan, B. Güveli Tekin, T.S. Aydemir, C. Dayan, H.D. Ataklı
Bakırköy Prof Dr Mazhar Osman Education and Research Hospital for Psychiatric and Neurological Diseases, Istanbul, Turkey

PP4078
A shimmering touch
S.D. Varanda1, A.F. Santos1, J.M. Rocha1, J.D. Pinho1, Z. Magalhães2, C.C. Ferreira1
1Neurology, 2Neuroradiology, Hospital de Braga, Braga, Portugal

PP4079
Heroin, marijuana and postpartum – a convulsive cocktail
Neurology, Hospital de Braga, Braga, Portugal

PP4080
Dynamic evolution of some oxidative stress markers after ischemic stroke
I. Varga1,2, D.I. Minea1,2, M.R. Batista2, M. Mihai2, L. Ionescu3
1Transilvania University, Faculty of Medicine, 2Neurology and Psychiatry Hospital, Brasov, 3Benedek Geza Cardiovascular Rehabilitation Hospital, Covasna, Romania
PP4081

Predictors and risk-factors of postpartum stroke
I. Verulashvili, M. Kortushvili
Neurology, Tbilisi State Medical University, Tbilisi, Georgia

PP4082

The relation of apolipoprotein B, lipoprotein (a) and lipids in patients with first ever ischaemic stroke
S.M. Vujisic1, S.V. Vodopic2, L. Radulovic2
1Department of Neurology, University Clinical Centre of Montenegro, 2Neurology, University of Montenegro, Medical Faculty, Podgorica, Montenegro

PP4083

Ischemic stroke in the course of the internal carotid artery dissection – therapeutic possibilities
R. Wagner, B. Adamkiewicz, K. Kierkus-Dłużyńska, A. Pawelec-Kuchnio
WSS im. Kopernika w Łodzi, Łódz, Poland

PP4084

Moya Moya disease associated with elliptocytosis leading to haemodynamic cerebral infarction – a case report
C. Weber1, A. Grisold1, A. Gruber2, C. Sillaber3, T. Traub-Weidinger4, E. Auff1, T. Sycha1
1Department of Neurology, 2Department of Neurosurgery, 3Department of Internal Medicine, 4Department of Nuclear Medicine, Medical University of Vienna, Vienna, Austria

PP4085

Basilar artery occlusion and stroke in young adults associated with antiphospholipid antibody syndrome
B. Gökçe Çokal, S. Keskin Güler, H.N. Güneş, T.K. Yoldaş
Neurology, Ankara Education and Research Hospital, Ankara, Turkey

PP4086

Clinical evaluation of cerebral venous sinus thrombosis
S. Yücel1, D. Necioğlu Örken2, Y. Şengül3, N. Parasız Yükselen4, M. Gökyiğit2
1Kütahya Dumlupınar University Evliya Çelebi Research and Training Hospital, Kütahya, 2Istanbul Şişli Hamidiye Etfal Research and Training Hospital, Istanbul, 3Erzurum Regional Research and Training Hospital, Erzurum, 4İğdır State Hospital, İğdır, Turkey