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Cerebrovascular diseases 2

PP2001
Quality of life in patients after spontaneous subarachnoid hemorrhage
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Introduction: Favorable outcome and reduced quality of life (QoL) in survivors after spontaneous subarachnoid hemorrhage (SAH) is well documented in literature, therefore the aim of this study is to evaluate level of disability and QoL after spontaneous SAH, and compare QoL in surgical and non-surgical patients.

Methods: The research is a cross-sectional study of 92 patients (50 patients with surgically treated aneurysmal SAH, 42 patients with conservatively managed spontaneous SAH). Functional outcome was evaluated by modified Rankin Scale (mRS), QoL was measured with SF-36 in 3 months’ period after discharge from hospital.

Results: In surgically treated patients’ group mean age was 46.7 (26 male, 16 female); by mRS good outcome had 62% and 57% patients, respectively. The mean Physical Health and Mental Health scores of SF-36 were 46.18±12.06, 46.30±10.49 and 47.85±5.91, 41.90±4.97, respectively. In both groups significantly low scores in emotional role (RE) were reported, also in physical role (RP) in conservatively managed patients’ group. In surgically treated patients’ group mean scores of components of SF-36 were lower in elderly (>51) and in poor-grade patients (H&H >3), especially in domains of Physical Functioning, RP and RE, also General Health and Vitality. There was statistically significant correlation between mRS and physical and mental components of SF-36 (p<0.05).

Conclusions: Survivors after spontaneous SAH despite having good outcome suffer from lower QoL, especially in emotional sphere; hence more attention should be paid to emotional disorders after SAH resulting in improving QoL in such patients.

Disclosure: Nothing to disclose

PP2002
Red blood cells aggregation in a rat model of thromboembolic stroke
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Introduction: Microvascular blood flow appears to play a pivotal role in ischemic stroke contributing to restoration of oxygen supply, neuroprotection and prognosis. Blood rheology characterizes blood flow in microvessels and might be essential in stroke pathology. The aim of the study was to evaluate the hemorheological disturbances in rat model of thromboembolic stroke (TS).

Methods: Male Wistar rats were underwent TS (n=9) or false surgery (n=10). After 24 hours infarct size was assessed by 7-T MRI (BioSpec 70/30, Bruker, Germany); neurological examination (McGrow scale, Benderson scale, sensorimotor tests) was conducted and kinetics of spontaneous aggregation and disaggregation of red blood cells (RBC) in shear flow was evaluated by light reflection technique (LADE, RheoMedLab, Russia).

Results: Infarct size correlates to the severity of neurological deficit (r=0.67, p<0.05), which in turn correlates to the rate of initial RBC aggregate formation (r=0.78, p<0.05). Hydrodynamic strength of RBC aggregates was found to be decreased in TS group (36.84 [30.97; 46.42] 1/s comparing to 41.88 [43.83; 54.77] 1/s, p<0.05).

Conclusions: Increased rate of initial RBC aggregate formation may contribute to the disturbances of blood flow in microvessels. Lowering of strength of RBC aggregate in TS probably relates to compensatory reaction. Further investigation will allow shedding light on the issue of microvascular blood flow impairment in ischemic stroke.

Disclosure: Nothing to disclose
PP2003

Myogenic compression of internal jugular vein – an unrecognised condition – is it the new indication for botulinum toxin treatment?

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Introduction: There are 2 main syndroms of nervous structure compression with muscles - scalenus syndrom and piriformis syndrom which are indications for botulinum toxin (BTX) treatment. We suppose that not only nerve compression, but also magistral vein compression may be important medical problem and key point for successful treatment.

Methods: We examined 17 patients (2 men, 15 women) with internal jugular vein (IJV) compression (mainly unilateral) revealed by magnetic resonance imaging (MRI) venography. In most cases there were complaints of hypertension headache combined with headache located in occipitotemporal area, dyssomnia due to headache. Clinical examination didn’t reveal severe focal symptoms. Palpation of digastric muscle posterior belly and upper part of sternocleidomastoid muscle produced local pain and increased occipitotemporal pain. MRI of head and neck revealed unilateral contraction of posterior belly of digastric muscle with surrounding structure conflict.

Injections of BTX type A were performed into digastric muscle belly and into sternocleidomastoid muscle in all patients on side of compression. Dosage varied from 50 till 70 IU.

Results: Clinical improvement started in 10-14 days after injection with complete disappearing of symptoms in 3-4 weeks period in all patients. MRI venography was repeated in 4-6 weeks after injection and it demonstrated complete restoration of IJV blood flow in 14 (88%) patients and improvement of IJV blood flow in 2 (12%) patients.

Conclusions: Myogenic reaction may lead to IJV compression with specific clinical manifestations. The MRI set may detect compression of vein and spasm of muscle. BTX injection may be optimal treatment for such group of patients.

Disclosure: Nothing to disclose

PP2004

Cerebral venous thrombosis due to neurobrucellosis

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Introduction: Brucellosis is considered to be the most widespread zoonosis in the world. Nervous system involvement is rare. We report a case of neurobrucellosis.

Case report: A 20-year-old man was admitted to the hospital with a 2-month history of headache and two episodes of seizures. He also presented neck pain and fever. The patient lived in a rural area and he reported the ingestion of raw sheep milk.

Examination on admission revealed neck stiffness. Cerebro spinal fluid (CSF) findings revealing a lymphocyte pleocytosis and an increased protein level. The results of agglutination titers for Brucella species were significantly elevated in both serum and CSF. Cerebral magnetic resonance imaging revealed cortical thrombosis in the left temporal and occipital lobe. Intravenous heparin was started and a therapy with Rifampicin, Doxycycline was instituted.

Discussion: Neurobrucellosis may lead to a variety of clinical manifestations and imaging abnormalities that mimic other neurologic diseases. The most common presentation is as a typical meningitis or meningoencephalitis. Brucella can involve cerebral venous sinuses causing pseudotumor cerebri-like symptoms. Cerebral venous thrombosis may occur as a complication of brucellar meningitis. The vascular insult is likely due to an inflammatory process of the venous system. There are only a few cases reported in the literature. The outcome is favorable if treatment is started early and continued for an adequate period.

Conclusions: Neurobrucellosis may appear with different clinical manifestations. Since brucellosis in an endemic zoonotic disease in Tunisia, neurobrucellosis should be considered in the differential diagnosis of patients presenting with a cerebral venous thrombosis.

Disclosure: Nothing to disclose
PP2005
Smoker's paradox in ischemic stroke: independent association or simple coincidence?
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Introduction: It is still unclear whether pre-stroke tobacco smoking may independently improve prognosis after stroke. We aimed to evaluate the association between smoking, patients’ profile and short-term outcome in acute ischaemic stroke.

Methods: This is a retrospective analysis of consecutive patients admitted to our stroke center between June 1995 and September 2011. Data were prospectively collected in a detailed registry. Patients were categorized as: 1) current-smokers, who smoked at least occasionally within 5 years before stroke onset; 2) past-smokers, who stopped smoking more than 5 years before stroke onset; 3) never-smokers. Basic comparisons between particular groups were preceded by an overall test for significance.

Results: We identified 983 (26%) current-smokers, 622 (17%) past-smokers and 2,121 (57%) never-smokers. Those three groups significantly differed in age (63, 73, and 78 years, respectively), burden with major vascular risk factors, presence of pre-stroke disability (15%, 21%, and 29%) and predominant stroke etiology (large artery atherosclerosis, cardioembolism or large artery atherosclerosis, and cardioembolism). Baseline neurological deficit was more severe in never-smokers (NIHSS 7, 7 and 10). Unadjusted logistic regression showed that compared to never-smokers, both current-smokers and past-smokers were less likely experience in-hospital death (OR 0.49, 95%CI:0.38-0.63 and OR 0.64, 95%CI:0.49-0.85, respectively). They were also more likely to achieve good outcome at discharge (OR 1.84, 95%CI:1.48-2.15 and OR 1.73, 95%CI:1.44-2.07). However, those associations were not confirmed in a multivariable analysis.

Conclusions: Smokers may achieve better outcome after ischaemic stroke. However, this paradox is not a causal association but rather depends on age and comorbidities.

Disclosure: Nothing to disclose

PP2006
Production of pro-inflammatory cytokines in patients with progressive cognitive deficit after subarachnoid hemorrhage
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Introduction: The aim of study was to evaluate the state of systemic inflammatory response in patients 1 year after aneurysmal subarachnoid hemorrhage (SAH) with prominent decline in cognitive function.

Methods: Total number of 32 patients after non-traumatic SAH and 10 healthy volunteers were included in the study. Cognitive status was assessed by Montreal cognitive assessment (MoCA). Cut off point for progressive cognitive deficit (PCD) was estimated as MoCA score after 1 year of SAH onset less than 19 points or MoCA score decline more than 9 points. IL-1β, IL-6, IL-17 and CRP were estimated in blood plasma by the ELISA-method. Patients were tested at discharge from the hospital and 1 year after disease onset.

Results: PCD one year after SAH was determined in 15.6% of patients. Concentration of IL-1β, IL-6 and CRP in patients with PCD did not differ from patients without PCD 1 year after SAH. CRP concentration was higher in both groups while compared to control group at initial examination (p<0.05) and 1 year after SAH onset (p<0.05), however no significant differences between groups with mild and prominent cognitive decline were found. In group with PCD significant increase in IL-6 and IL-17 production at initial examination as well as increased IL-17 production 1 year after SAH onset were found (OR - 4.01 (95% CI 1.27-11.40; p=0.02).

Conclusions: PCD after one year SAH was associated with increased production of IL-17 and IL-6 in early recovery period and delayed increase in IL-17 production 1 year after disease onset.

Disclosure: Nothing to disclose
PP2007

Platelet function and risk factors of resistance to acetylsalicylic acid used in the prevention of stroke

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Introduction: The aim of the study was to evaluate the prevalence of resistance to acetylsalicylic acid (ASA), used for prevention of stroke, including the assessment of risk factors associated with ASA resistance (AR).

Material and methods: 340 patients taking ASA and 46 healthy volunteers were enrolled in the study. Patients were divided into the following groups: 1 (acute phase of stroke), 2 (chronic phase of stroke), 3 (patients without stroke, but with high cerebrovascular risk; SCORE>10%). Platelet function was assessed by impedance aggregometry method in the whole blood using a multi-channel platelet function analyzer (Multiplate®, Dynabyte).

Results: The prevalence of AR ranged from 35% (acute phase of stroke) to 44% (patients without stroke). AR was slightly but insignificantly higher in patients with diabetes mellitus. The following risk factors for AR were determined: ASA dose<100 mg/daily, taking ASA>1 year, heart rate>70 beats/min, smoking, taking ACE inhibitors and nitrates, haematocrit>40%, platelet count>300x10³, LDL concentration >3.5 mmol/l. The probability of the critical event was significantly higher for diabetic patients with AR (OR 4.78; p=0.04). For the remaining patients with AR the risk for a critical event was higher but insignificant.

Conclusions: The study confirmed the occurrence of AR in many patients taking ASA for stroke prevention. Risk factors for AR are as follows: low ASA dose, longer time of ASA therapy, higher heart rate, nicotinism, usage of some drugs, higher haematocrit and platelet count, abnormal LDL. The laboratory AR established by impedance aggregometry increases the risk for clinical AR.

Disclosure: Nothing to disclose

PP2008

The sex hormone ratios and risk of acute cerebral infarction

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Introduction: Sex hormones may be associated with higher incidence of clinically significant stroke or stroke related events. Elucidating the impact of sex hormones on the cerebral vasculature is important for understanding male-female differences in stroke and various conditions. The aim of the present study was to assess the role of sex hormone ratio in acute ischemic stroke.

Methods: Between January 2011 and December 2013, a total of 154 patients with acute cerebral infarction or transient ischemic attack, and 132 control subjects were included in this study. Sex hormones including estradiol, estrogen, testosterone, free testosterone and progesterone of all patients were investigated. We analyzed sex hormone ratio of these patients.

Results: In men, compared with control group, estradiol/testosterone (E/T) ratio and estradiol/free testosterone (E/T free) ratio were significantly elevated in the stroke patient group. (p=0.036 and p=0.024). On the contrary, there was no evidence for an association between ischemic stroke and E/T, E/T free ratio in women.

Conclusions: Sex hormones may play a complicated role in determining the risk of stroke. In this study, higher E/T or E/T free ratio were associated with ischemic stroke in men. Other sex hormone ratios were not related with acute ischemic stroke. These findings support the hypothesis that increased estradiol and reduced testosterone were associated with ischemic stroke, particularly in men.

Disclosure: Nothing to disclose
PP2009

Neuroprotective effects of amlodipine besylate on oxidative stress-injured neural stem cells

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Introduction: Hypertension is the main risk factor for various neurological diseases. Amlodipine besylate (AB), a Ca²⁺ antagonist and widely-used antihypertensive drug, has been reported to reduce oxidative stress. In this study, we examined the neuroprotective effects of AB on oxidative stress-injured neural stem cells (NSCs) with a focus on the phosphatidylinositol 3-kinase (PI3K) pathway.

Methods: We treated primary cultured NSCs injured by H₂O₂ with several concentrations of AB. The viability of NSCs was measured by trypan blue staining and LDH assay, and apoptosis was investigated by TUNEL and DAPI staining. To evaluate the effects of AB on proliferation of NSCs we performed BrdU labeling and colony formation assays. The level of free radical production was also checked. We confirmed the effects of AB on intracellular signaling proteins by Western blot analysis.

Results: After treatment with H₂O₂, the viability of NSCs decreased, but co-treatment with AB restored the viability of H₂O₂-injured NSCs. H₂O₂ increased free radical production and apoptosis in NSCs, while co-treatment with AB attenuated these effects. NSC proliferation decreased upon H₂O₂ treatment, but that combined treatment with AB restored proliferation. Western blot analysis showed that AB treatment increased the expression of cell survival-related proteins linked with the PI3K pathway, but decreased the expression of cell death-related proteins.

Conclusions: Our results suggest that AB restores H₂O₂-inhibited viability and proliferation of NSCs by inhibiting oxidative stress and activating the PI3K pathway.

Disclosure: Nothing to disclose

PP2010

In-hospital mortality among stroke patients admitted to hospital on weekends as compared to weekdays

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Introduction: The purpose of present investigation was to compare in-hospital mortality of patients admitted for stroke during weekdays and those admitted during weekends. The study was conducted in the Department of Neurology, Split University Hospital (DNSUH).

Methods: Data were analyzed for 3,868 consecutive stroke patients admitted to DNSUH from January 2005 to December 2010. Inclusion criteria were known outcome, whether it was death or discharge to home care or in some rehabilitation centers. Exclusion criteria were incomplete medical records and the unknown outcome. The main outcome measure was mortality from stroke.

Results: 2,899 patients were hospitalized on weekdays and 969 on weekends. Percentage of deaths was 22.84% on weekdays and 23.84% on weekends (p=0.412). The highest mortality was observed in patients admitted on Friday (25.49%), but there was no statistically significant difference compared to the other days of the week (p=0.515). There was no difference in mortality over the weekend in relation to the type of stroke: ischemic (20.57 : 21.36; p=0.623) or hemorrhagic (43.00 : 39.69; p=0.524), or in relation to the age of patients divided in four age groups (p=0.482, p=0.116, p=0.724, p=0.815).

Conclusion: In conclusion, the in-hospital mortality of patients with stroke admitted to DNSUH during weekend was the same compared with stroke patients with a weekday admission. Of predictors for in-hospital outcome, timing of admission had no significant influence on mortality.

Disclosure: Nothing to disclose
PP2011

Incidence of admission hyperglycemia and relationship to the functional outcome of acute ischemic stroke patients

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Introduction: Hyperglycemia (HG) occurs in up to 60% of stroke patients without known diabetes. HG after acute stroke is associated with larger infarct volumes and cortical involvement, and with poor functional outcome. It is common practice in stroke units to reduce blood glucose levels exceeding 180mg/dl (10mmol/l). The aim of this study was to investigate the incidence of HG and the relationship to the functional outcome of acute ischemic stroke patients.

Methods: We analyzed 114 adult nonconsecutive patients (age: median 66.2 years, 61% men) with first ischemic stroke ever. HG is defined as a blood glucose level above 110mg/dl. Functional outcome at 90 days was assessed using the modified Rankin Scale (mRS). A poor outcome was defined a mRS score ≥2.

Results: Admission glucose level >110mg/dl was found in 69 patients (60.5%). A level between 110 and 179 mg/dl in 48 (69.6 %) and a level >180 mg/dl in 21 (30.4%) patients. mRS score ≥2 was found 53 (76.8%) patients with HG, in 15 (71.4%) patients with glucose level >180mg/dl. mRS ≥2 was found in 24 (53.3%) normoglycemic patients.

Conclusions: Despite small number of patients our findings suggest that the incidence of admission HG is high and associated with poor functional outcome, and it is consistent with literature data. Aggressive hyperglycemic control in ischemic stroke remains still a controversial and challenging problem.

Disclosure: Nothing to disclose

PP2012

Profile and management of stroke patients in Eastern Democratic Republic of Congo

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Introduction: Stroke is one of the leading causes of adult death and disability worldwide. In the Sub-Saharan Africa, despite prevailing infectious diseases, non communicable diseases such as cerebral stroke have progressively become important, but poorly documented.

Methods: This observational pilot study, the first carried in Bukavu (eastern part of the DRC), aimed at characterizing stroke patients (SP) and matched controls, mainly regarding cardiovascular risk factors (CVRF). It consecutively included 31 SP admitted at the reference provincial hospital among which 19 could be compared to age- and sex-matched controls.

Results: Stroke patients were predominantly males and young. Brain imaging was poorly available, revealing mostly hemorrhagic stroke. The main recorded CVRF were high blood pressure (HBP), BMI, total cholesterol, LDL, triglycerides, low HDL and regular alcohol consumption. Females were more frequently affected by CVRF related to body fat excess. Only HBP was associated to increased risk of strokes. Stroke outcome was comparable to that of other African reference centers.

Conclusions: Our study further emphasizes on the important role of high blood pressure in mostly young stroke patients in Africa, while body fat excess appears to be predominant in women. Though, our findings need still to be confirmed by larger studies. The role of other CVRF like psychological stress should be evaluated in this war-torn region, as well as alcohol consumption and diabetes, which supposedly have high prevalence in the region.

Disclosure: Nothing to disclose
PP2013

Evaluation of dementia syndrome in post stroke patients

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Aim: The assessment of post stroke dementia and its correlation with clinical and imaging data.

Methods: We studied the charts of 237 stroke patients followed up at the neurology unit, ambulatory, Tirana. They are presented at least three months after the first or recurrent stroke. Diagnosis of dementia was made according to the DSM IV criteria. All patients underwent a detailed neurological examination. HIS score was applied. CT, MRI of the brain is requested. Patients who had previous history of dementia, impairment of communication after stroke were excluded from the study. SPSS 17.0 program was applied for data analyze.

Results: The mean age is 67.5 (±5, 9) years old. There are 71 females and 166 males. We analyzed the data of 67 (28%) patients of them who met criteria for dementia. 40 patients of them had 4-7 in HIS score. 27 patients had >7 in HIS score, 0 patients had <4 in HIS score. There is a statistically significant correlation between post stroke dementia and ages of patients, level of education, cardiovascular diseases, diabetes. There is a statistically significant correlation between PSD and multiple and subcortical vascular lesions. No significant correlation between post stroke dementia and subtype of stroke, carotid stenosis, hypertension, hypercholesterolemia, between subtypes of post stroke dementia and vascular risk factor is found.

Conclusions: This study suggests that dementia syndrome is most frequent in stroke patients with multiple and subcortical vascular lesions. Multiple vascular risk factor are more predictive for post stroke dementia.

Disclosure: Nothing to disclose

PP2014

Risk factors of hemorrhagic transformation and parenchymal hematoma in patients with ischemic stroke

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Introduction: Hemorrhagic transformation (HTf) and parenchymal hematoma (PH) are complications of ischemic stroke. The aim of the study is to clarify the risk factors of HTf and PH in hospitalized patients with ischemic stroke, not treated with thrombolysis.

Methods: A total of 149 patients with acute ischemic stroke were included in this study in four months period. The diagnosis of ischemic stroke was made by diffusion weighted MRI. HTf and PH were detected with brain CT within 1 week after diagnosis of ischemic stroke.

Results: HTf and PH were observed in 41 patients (27.5%) (18 female, 23 male). Obesity (BMI>30) (41.4%), hypertension (73.1%) diabetes mellitus (31.7%), coronary artery disease history (31.7%) and recurrent stroke history (31.7%), smoking (43.9%) were noted according to percentage values. None of them was treated with anticoagulant drugs and 48.7% of patients were under antiaggregant drugs treatment before ischemic stroke. Large and small artery atherosclerosis (41.4%) and cardio embolism (39%) were the most common etiological factors. We began antiagregant treatment to 17% of patient, combination of antiaggregant and low-dose unfractionated heparin treatment to 56% of patient and anticoagulant treatment to 27% of patient after ischemic stroke. HTf was detected in 80.5% of patients and PH was detected 19.5% of them.

Conclusion: Our study suggests that the significant risk factors of HTf and PH were hypertension, obesity and smoking. Cardio embolism was the most common etiology in PH.

Disclosure: Nothing to disclose
PP2015

Recurrent PRES or something mimicking it?

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Posterior reversible encephalopathy syndrome (PRES) is characterized by headache, seizures, altered consciousness and visual disturbances. Magnetic Resonance Imaging (MRI) shows vasogenic edema with signal changes on T2 and FLAIR, located in the parieto-occipital lobes. Precipitating factors are hypertension, hypercalcemia, uraemia, immunosuppressants, infection (HIV) and autoimmune diseases. Recurrence of PRES is uncommon, ranging between 3.8%-8%. A 76-years-old man presented in May 2012 with a single generalized seizure without other neurological symptoms. MRI showed vasogenic edema predominantly in the right parieto-occipital lobe. He received prednisolon 100mg/day for 6 days. MRI after 3 weeks showed remission of the lesions. CSF was normal. MRI after 3 months revealed relapse of the edema. He got diagnosis for PRES and antihypertensive treatment was initiated. In December 2013 he was re-admitted with confusion, headache and vomiting. High blood pressure was observed (180-210/70-90). His clinical status returned to his baseline over 9-10 days as the blood pressure was gradually lowered. Routine blood investigations were negative, including se-calcium, ACE, ANA, ANCA-C, ANCA-P, immunoglobulins, M-component, HIV, and paraneoplastic antibodies. Brain MRI disclosed new bilateral but now predominately left-sided parietal, frontal and temporal signal changes without contrast enhancement and normal MR angiography. CSF examination showed slightly elevated protein (0.72) and IgG (0.74). Flow cytometry was normal. Brain biopsy was performed; histological diagnosis is pending but will be presented at the congress.

Here, we present a patient with three PRES-like radiological relapses where atypical PRES are suspected but PRES mimicking lymphoma can neither exclude until the histological confirmation.

Disclosure: Nothing to disclose

PP2016

Intra-arterial tissue plasminogen activator in acute ischemic stroke

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Introduction: The 'hyper dense middle cerebral artery (MCA) sign' on plain CT scan of brain in acute ischemic stroke, indicates acute thrombotic occlusion of MCA.

Objective: We evaluated the serial progression of this sign on follow-up CT/MRI and its effect on recanalization and clinical outcome after intra-arterial thrombolysis with tissue Plasminogen Activator (tPA).

Materials and methods: 33 acute ischemic stroke patients who were treated with intra-arterial (tPA 9 12-18mg) within 6 hours of symptom onset were enrolled in this study. Recanalization status was evaluated using the thrombolysis in myocardial infarction (TIMI) flow grade on digital subtraction angiography immediately after thrombolysis. Baseline clinical parameters and clinical outcome were reviewed.

Results: A positive Hyper dense MCA sign was detected in 39%. The mean TIMI grade was higher in the patients with a positive sign (2.8 vs 1.1, respectively (p<0.005). A history of atrial fibrillation was significantly higher in the patients with hyper dense MCA sign. In 86% of patients with the positive sign, the sign disappeared on follow-up CT/MRI, and disappearance of the sign was well correlated with complete recanalization on follow-up CT/MR angiography in 22/28 (79%) patients. This sign was not associated with a favourable functional outcome 30 later.

Conclusions: The Hyper dense MCA sign is indicative of acute thromboembolic occlusion and predicts the immediate effectiveness of intraarterial thrombolysis. There was good recanalization rate of 79%. The appearance of this sign was not associated with a favourable clinical outcome after thrombolysis.

Disclosure: Nothing to disclose