

arterial hypertension (AH). Colour-coded duplex sonography was used to determine the extracranial blood flow velocity and the intima media thickness (IMT) of common carotid arteries (CCA), the presence of atherosclerotic plaque. A parallel magnetic resonance imaging (MRI) was applied to all patients. **Results:** The combination of AH and dyslipidemia, AH and obesity, AH and heart diseases were predominated. In AIDCC the combination of AH and diabetes was more frequent than in patients with RF for CVD. Compared to controls and patients with RF for CVD in the group with AIDCC a significant enlargement of the ventricles was found. A strong correlation was found between enlargement of the external cerebrospinal fluid spaces and exaggerated vessel resistance. In AIDCC the changes in carotid blood flow and cerebral parenchyma progressed with the increase in duration, severity and non-systemic treatment of AH. **Conclusion:** The study confirms the non-equal role of particular RF in the pathogenesis of AIDCC - leading role among them plays the duration, severity and type of treatment of AH, LDL- hypercholesterolemia, diabetes and age.

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#### **Cerebrovascular Reserve Capacity in Patients with Unilateral Stenosis/Occlusion**

G. Xiping, X. Gong, Q. Song, K. Dong, X. Zhao, Y. Wang

Department of Neurology, Beijing Tiantan Hospital, Affiliated To Capital Medical University, Beijing, China, Department of Neurology, Beijing Longfu Hospital, Beijing, China

**Objective:** To observe the non-invasive, quantitative analysis of the cerebral vascular reserves (CVR) in patients with unilateral MCA stenosis using autologous carbon dioxide (CO<sub>2</sub>) inhalation method. **Methods:** We studied 32 subjects admitted to our institute with unilateral stenosis/occlusive MCA disease confirmed by DSA or MRA combined TCD. All 32 patients underwent CVR testing using autologous CO<sub>2</sub> inhalation. CVR was assessed by measuring the increase in MCA mean flow velocity in response to hypercapnia. Continuous tracings of bilateral MCA flow velocity, heart rate, respiratory rate, and PCO<sub>2</sub> were recorded simultaneously. **Results:** CVR was significantly reduced in stenosed MCA ( $1.72 \pm 0.63\%/\text{mmHgPCO}_2$ ) compared with contralateral ( $2.71 \pm 0.83\%/\text{mmHgPCO}_2$ ;  $p < 0.05$ ). Poor CVR values are usually observed in patients with a higher degree of stenosis and particularly with insufficient collateral compensation. CVR was significantly reduced in severe stroke patients (Modified Rankin Scale = 1) compared with asymptomatic or TIA patients ( $p < 0.05$ ). **Conclusions:** Assessment of cerebral CVR is an important adjunct to measurement of cerebral blood flow for diagnosis, monitoring or prognosis of cerebrovascular disease. CVR is impaired in patients with MCA stenosis. Assessing CVR may allow a subgroup of patients with MCA stenosis who are at a higher risk of hemodynamic stroke to be identified. CVR may be a more relevant marker of impaired hemodynamics. It may represent a marker of increased stroke risk, although this needs to be determined in prospective studied.

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#### **Ultrasound Perfusion Imaging Through the Foramen Magnum for Detection of Hypoperfusion in the Posterior Circulation**

A. Alonso, A. Dimitrios, M. Bolognese, M.G. Hennerici, S. Meairs, R. Kern

Department of Neurology, Universitätsmedizin Mannheim, Heidelberg University, Germany

**Objectives:** Ultrasound perfusion imaging (UPI) is an emerging technique for the assessment of brain perfusion in acute ischemic stroke. However, this technique has been limited to the anterior circulation via the transtemporal bone window. We present a case of impaired brain perfusion assessed by UPI using the transforaminal approach in a patient with cerebellar infarction. **Methods:** A 65-year-old woman presented with vertigo, nausea and vomiting. MRI showed a large acute ischemic stroke in the territory of the left posterior inferior cerebellar artery (PICA). UPI was performed with a 1–5 MHz sector transducer using power-modulated pulse inversion imaging (Philips IU22). Two milliliters of the echo contrast agent SonoVue™ were administered intravenously. For real-time bolus kinetics, serial ultrasound images at a mechanical index of 0.017 and a frame rate of 14Hz were taken over one minute following the bolus injection. ROIs were placed in the cerebellum left and right from the vertebrobasilar junction. Time-to-peak (TTP) and peak intensity (PI) were calculated employing the QLab software. **Results:** UPI through the foramen magnum revealed a TTP of 17 sec in the right cerebellar hemisphere whereas TTP was 24 sec in the left cerebellar hemisphere, indicating a severe perfusion deficit. Additionally, PI was 2.7dB in the right, but 2.2dB in the left cerebellar hemisphere. Thus all findings were consistent with brain infarction in the left PICA territory. **Conclusion:** UPI via the transforaminal approach is a new approach to investigate acute ischemic stroke in the posterior circulation.

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#### **Blunted Diastolic Function in Young Adults Affected by Cryptogenetic Stroke**

P. de Campora, G. Malferrari, S. Sanguigni, S. Sanguuolo

UOC Cardiologia-Utic Ospedale Fatebenefratelli Napoli, Italy. UOC Neurologia Ospedale S. Maria Nuova – Reggio Emilia Italy, Dept Of Neurology, Ospedale S. benedetto Tronto, Italy

**Objective:** In young patients stroke etiology is often cryptogenetic. Our aim to study cardiac function in juvenile stroke patients by cardiac ultrasound (TTE). Stroke diagnoses was able according to NMR evidence of ischemic lesions. **Methods:** 50 patients (25 males, 25 women;  $29 \pm 5$  yrs) and 50 age-sex matched controls subwent TTE examinations. Ejection Fraction (EF), chamber volumes were measured. Diastolic function was evaluated by four chambers echographic window for a better definition of mitral valve plane. Transmitral filling velocities;

pulmonary venous atrial reversal duration; lateral and septal early diastolic mitral annular velocities; E/lateral early diastolic mitral annular velocity; E/septal early diastolic mitral annular velocity were assessed. Subjects presenting mitral valve calcinosis, mitral valve prolapses and hypertensives were excluded by the investigation. **Results:** In Stroke-Patients as well as in control group, cardiac chambers volumes and Left Ventricular Ejection Fraction showed normal parameters according with the age of patients. No distinctions between sexes was found. In Patients, Diastolic Function (DF) parameters showed a significative impairment (33/50: 66%) vs control group (13/50:26.6%). Stroke etiology did not influence DF parameters behaviour. Stroke-Patients have an Odd Ratio of 2.53 for blunted diastolic function in comparison to controls. **Conclusions:** In young stroke patients, echocardiographic evaluation is routinely performed to assess cardiac function. According to the young age of these patients, failure of systolic function or cardiac chambers enlargement is rarely found. Involvement of different cardiac haemodynamic mechanisms may be considered to explain undetermined stroke etiologies. Further studies are necessary to confirm our hypothesis.

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#### **Transient Ischemic Attacks Caused by Cloth in Proximal Internal Carotid Artery**

*S. Jolic, M. Jolic, N. Vukasinovic, M. Zivkovic, M. Ilic*

Clinic of Neurology, Clinical Center Nis, Serbia. Institute of Radiology, Clinical Center Nis, Serbia

**Objective:** To describe a clinical case of repetitive transient ischemic attacks. **Methods:** A 57 years old male patient was admitted in our clinic, due to a repetitive, transient weakness of right limbs and transient left eye blindness. That happened from 2 to 6 times during previous 4 days. He only suffered from hypertension for 15 years. **Results:** On admission there was no motor deficit and his vision fields were bilaterally undamaged. Except mild hypercholesterolemia, his laboratory results were normal. Just after admission carotid ultrasound examination revealed good morphological and hemodynamic finding in both vertebral arteries and right ICA, but high grade left ICA stenosis, caused by cloth. Also, on Doppler wave spectrum, recorded distal from cloth, there were seen sporadic hyper intense signals, that did not meet all criteria for micro embolic signals. Transthoracic and transoesophageal echocardiography were normal. Brain CT and MR were performed, and no ischemic lesions were found, and low molecular heparin was applied. Then angiography was performed, and, immediately after it, combined with distal cerebral protection, percutaneous transluminal balloon dilatation with stent placement was done. Control neurological status and brain MR were normal. **Conclusion:** Ultrasound examination of carotid vessels might be crucial and technique of choice in some stroke cases.

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#### **Cerebrovascular Disease, Coronary Disease and Changes in Carotid Arteries**

*A. Camacho, C. Guilherme, J. Trigo, W. Santos, S. Eiriz, R. Faria, C. Basilio, V. Gomes*

Hospital Faro, Portugal

**Objectives:** The assessment of carotid stenosis by duplex ultrasonography is a efficient, safe and reproducible method, allowing the measurement of the intima-media thickness (IMT) and the detection of plaques. Compare the results of the ultrasonography between patients with myocardial infarction (MI) and patients with stroke, and analyse their correlation with cardiovascular risk factors. **Methods:** We analysed retrospectively the ultrasonography results of 131 patients with MI, and 290 patients with stroke. We compared: age, sex and risk factors in both groups. Measurements of the IMT were made in the distal 10 mm of the common carotid artery (CCA) and calculated the mean of two measurements in each CCA. Increased IMT was considered when  $>0,9$  mm. Plaque was considered as localized parietal thickening protruding into the lumen. **Results:** Evaluated both groups (total 421 patients) regarding risk factors and the results of ultrasonography, in multivariate analysis, were independent predictors of IMT  $>0,9$  mm, the age  $>70$ , male sex, hypertension and diabetes. The independent predictors of plaque were: age, male sex and diabetes. **Conclusion:** 1 – The prevalence of risk factors is high in both populations, but with higher percentage of dyslipidaemia and obesity in the patients with myocardial infarction. 2- In those patients with atherosclerotic disease in different locations, the presence and characteristics of the plaques was similar, but the patients with MI had higher prevalence of IMT  $>0,9$  mm. 3- Age, male sex and diabetes were predictors of plaques and IMT  $>0,9$  mm. The hypertension was predictor of IMT  $>0,9$  mm.

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#### **Ultrasonology Data Correlation with Magnetic Resonance Angiography in Patients with Acute Central Vestibular Vertigo: Our Experience**

*D. Jegere, L. Inara, J. Liga*

Riga Stradins University, Latvia

**Objectives:** Acute central vestibular vertigo (ACVV) characterizes with ocular motor, postural, and perceptual signs, may be accompanied by vegetative symptoms like sweating, nausea vomitus and collapse and may present in various neurological pathologies as trauma, metabolic changes, cardio-vascular disorders, vertebrobasilar insufficiency and others. The aim was to analyze and compare the duplex scan data of intra- and extracranial arteries and Magnet Resonance Angiography (MRA) of cerebral posterior circulation and to evaluate the informativity of duplex sonography to diagnose patients with CVV. **Methods:** A group of 15 patients mean age 67.2 years (30–75) with different neurological symptoms in combination with ACVV who were hospitalized in the Emergency department was analyzed. All of