

and the increase of Vmax, Vmin, and Vmean in the iMCA after the treatment ( $p = 0.031$ ,  $p = 0.0098$ , and  $p = 0.0139$  respectively). There was no significant difference between the neurological deficit before and after CAS ( $p = 0,31$ ).

**Conclusions:** 1. CAS results in the early hyperperfusion within the both MCAs. It concerns relatively small group of patients. 2. The hyperperfusion occurs after CAS performed in the right ICA in particular. 3. The CAS appears to be safe procedure, and the moderate hyperperfusion seems to favor the mechanisms preventing the early neurological complications after CAS.

## A. GRUMEZA

### *Stupefiation phenomenon, rehabilitation perspectives*

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**Background:** The study deals with stupefiation phenomenon of cerebral tissue caused by internal carotid artery stenosis before and after endarterectomy.

**Methods:** The study included 15 patients, aged between 29-63 year selected based on Doppler duplex exam between 2004-2007. Surgical intervention was delayed 5-270 days after neurological deficit institution countered according to barthel's index of activities of daily living (BAI).

All the patients underwent Doppler duplex exam and digital subtraction angiography 4-7 days before, 7 and 30 days after surgery.

**Results:** Clinical exam showed 95 points (BAI) in 1 case; 80 points in 2 cases; 25 - 40 points in 5 cases and 0 - 10 points in 7 cases. Doppler duplex and angiographic exam in 6 cases discovered internal carotid artery occlusion. In other 5 cases was demonstrated internal carotid artery stenosis; 2 cases stenosis in both carotid systems. In 1 patient was present left carotid occlusion associated with 60-70% right stenosis. BAI improvement came in 5 patients 8 hours after surgery (95-100 points - 1 case; 80-100 points - 1 case; 30-75 points in 2 cases; 10-90 points - 1 case); in 8 patients 24-48 hours after surgery (80-90 points in 1 case; 25 to 75 points - 3 cases; 10 to 65 points in 4 cases). In 2 patients improvement was noticed 4-7 days after recanalization. Stenosis grade of operated arteries changed after surgery as follows: by 45-50% - in 6 cases; 75-80% - 6 cases; 80-90% - 2 cases. Statistically significant correlation between reduction of stenosis grade and improvement of motor functions wasn't discovered.

**Conclusions:** Stupefiation phenomenon of ischemic cerebral tissue is present in patients with neurological deficit caused by internal carotid artery stenosis. For evaluation of motor rehabilitation prognosis in patients with neurologic deficit motor evoked potentials exam is perspective one.

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### *A prospective community-based study of stroke in Belarus: the Grodno Stroke Study*

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**Background:** Data on stroke incidence are lacking in Belarus. Therefore a population-based stroke register was established to determine incidence and case fatality in Grodno, a city on the border of European Union.

**Methods:** All suspected strokes occurred among 311 134 residents of Grodno-city were identified and assessed for all age groups. The registration started on January 1, 2001, and ended on December 31, 2003. Multiple overlapping sources of notification were used to ascertain cases, and standard criteria for stroke and case-fatality were used.

**Results:** During the study period 2724 cases of strokes among 2510 persons were registered, with 2069 being first-ever-in-a-lifetime strokes (FES). The diagnosis and pathological type of FES were confirmed by CT/MRI or autopsy in 43.9%, patient age ranged from 16 to 106 years (mean±sd age, 65.8±11.6 years). Among FES patients there were 1015

men (49.1%) and 1054 women (50.9%). The crude incidence rate for FES was 221.7 per 100 000 (95% confidence intervals [CI], 211.9 to 232.8), the rate standardized to the new WHO world standard population (Ahmad O.B. et al., 2002) was also 221.7 per 100 000 (CI, 211.9 to 232.8). FES incidence rates rose steeply with age in both sexes (till group 85+) and were higher in men in all age groups. Rate of hospitalization was 89.7%; the 28-day case fatality rate was 26.1% (CI, 25.1% to 27.1%). Of the 2069 FES, 1571 (75.9%) were cerebral infarction, 289 (14.0%) were intracerebral hemorrhage, 61 (2.9%) were subarachnoid hemorrhage and 148 (7.2%) were stroke of undetermined type.

**Conclusions:** Stroke incidence and case-fatality rates in Grodno were found to be of highest among other studies. The distribution of stroke subtypes was similar to that of other countries. Our estimates are useful for developing management services and allocating resources.

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### *B-flow versus Color flow ultrasound imaging in 50 patients with carotid pathology*

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The aim was to study/explore the difference in neurosonology delineating atheromatous plaques and morphology changes in patients with stroke and cerebrovascular risk factors.

**Methods and patients:** 50 patients, men 27 and women 23, mean age of 63 +9.7 years were examined with the use of color coded and duplex ultrasound device GE Vivid 7 Pro. All patients' pathology of the extracranial carotid and vertebral arteries were recorded as B-mode, B-flow, and Color flow pictures and velocity parameters were calculated.

**Results and conclusion:** Using B-flow resolution it could better visualize early and mild hypoechogenic plaques, define the site of small tubulences and swirls, hyperechogenic vessel changes with non significant velocity abnormalities, and give better plaque contrast in cross-sectional plane and as well as better delineation of the vessel contours and surface of thrombosis

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### *Algorithm of an Integrated Examination of the Vascular System as an Initial and Secondary Prevention of Stroke*

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Diseases of the blood circulation system take first places by their spreading and cause more than a half of all death cases and one third of causes of incapability. Despite of significant achievements of scientists today there is not a tendency to decreasing of indexes of the disease and death of cardiovascular diseases. This says for an insufficient study of the cardiovascular system according to the position of its adequate functioning. The venous system of the organism is not studied enough, it is considered to be in shadow and hardly accessible for life-time functional investigation. On the other side medical investigations of the cardiovascular system don't take into account peculiarities of hemodynamic regularities in norm and pathological reconstructions of moving of non-newton liquid in case of various illnesses.

In other words stroke means brain catastrophe. According to laws of hemodynamics and our extensive practical experience of controlling influence on hemodynamics we have a right to say that present generally accepted approach to examination of the vascular (mostly arterial) system is not sufficient. Today it is necessary to implement new innovative technologies of applied usage of knowledge of hemodynamics to examination of a condition of the cardiovascular system as an integral system of closed tube line of arterial, venous and capillary channels. Present investigation of the vascular system should take into account a state of elasticity of the vascular wall, its ability to transfer pulsate wave, expressiveness of the tonus of the vascular wall, size of the hydrodynamic intravascular pressure and its correspondence with pumping function of the myocardium and vessels' caliber, ratability of formation of the angioarchitectonic model of one or another reservoir. Taking into account all parameters of the multisided vascular system and assessment of synchronization of