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*The impact of pre-hospital care effectiveness on cerebral thrombolysis implementation in rural and urban areas of Pomeranian Province*

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The negative impact of rural accommodation on the cerebral thrombolysis implementation has been reported for European communities.

The aim of the study was to assess the influence of patients settlement on pre-hospital acute stroke care effectiveness and its impact on cerebral thrombolysis implementation in Pomeranian Province.

**Materials and methods:** The data of 946 patients recorded in Pomeranian Stroke Registry from 01.06.2006 - 31.05.2007 were evaluated: 524 hospitalized in 3 stroke units located in big urban areas (cities over 50 thousands inhabitants) and 421 treated in 5 stroke units located rural areas (towns below 50 thousands inhabitants).

**Results:** In rural areas a higher percentage of patients reported the delay of qualified medical aid over 45 minutes (57,9 % vs. 40,9% in urban areas,  $p < 0,001$ ) and have been transported to hospital from location different locality than the stroke unit location (73,5 % vs. 18%; respectively,  $p < 0,001$ ). In rural areas stroke patients have been more frequently transported to hospital by emergency specialist team (75,1 % vs. 67 % in urban areas,  $p < 0,001$ ), in urban areas more patients reached hospital by it's own transportation (23,7 % vs. 17,9 % in rural areas,  $p < 0,05$ ) and without any previous medical aid (10,6 % vs. 2,1 %; respectively,  $p < 0,05$ ). Both in urban and rural location a high percentage of patients delayed calling the medical service over 1 hour (64,7 % and 62,8 % respectively, ns). In rural areas 22,6 % of patients were admitted to stroke unit within 3 hours from stroke onset vs. 15,3 % patients in urban areas ( $p < 0,05$ ). In spite of that only 1,9 % of strokes were treated with rt-Pa in rural vs. 6,5 % in urban stroke units ( $p > 0,05$ ).

**Conclusions:** Our data indicate that a good efficacy of pre-hospital care is not sufficiently supported by the use of cerebral thrombolysis in rural areas of Pomeranian Province.

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*Ultrasound analysis of middle cerebral artery (MCA) blood flow in patients with carotid angioplasty and stent placement (CAS)*

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While the beneficial effects of carotid endarterectomy (CEA) on cerebral hemodynamics are well established, the research on CAS remains insignificant.

**Purpose:** To assess the impact of CAS on hemodynamic parameters of both MCAs of patients with hemodynamically significant internal carotid artery (ICA) stenosis using transcranial Doppler (TCD) monitoring.

**Materials and methods:** The study included 40 patients (30 men and 10 women) after first ever ischemic stroke. TCD monitoring was performed with a Multi-Dop P and 2-MHZ pulse-wave. The following parameters were measured: maximum (VMAX), minimum (VMIN), and mean (VMEAN) velocity, pulsatility index (PI), and resistance index (RI). Extracranial arteries were observed on the ultrasound Vivid-7 system using a 12-mhz linear probe. Patients with ICA stenosis >70% of vascular lumen were qualified for the study. Ultrasound examination of extracranial vessels was performed 2 hours prior and 24 hours after the insertion of a plain metal stent.

**Results:** Out of 22 patients with the CAS of right ICA, 4 individuals demonstrated hyperperfusion in the ipsilateral MCA (iMCA). In the contralateral MCA (cMCA) the hyperperfusion was found in 2 individuals (Vmax increased from 43 before to 89cm/s after CAS, and from 38 to 82cm/s respectively). There was no significant difference between the number of patients with hyperperfusion in the iMCA and cMCA ( $p = 0.634$ ). In patients with hyperperfusion within the right ICA, significant improvement involved: on average, Vmax ( $p = 0.024$ ), Vmin ( $p = 0.0475$ ), and Vmean ( $p = 0.0217$ ) respectively. It also concerned pi ( $p = 0.0325$ ). After CAS of the left ICA (18 patients), the hyperperfusion occurred in 1 person in iMCA (Vmax increase from 38 to 83cm/s after CAS), and in 1 patient in cMCA (the increase from 53 to 136cm/s respectively). A positive correlation was found between the degree of stenosis of the right ICA prior to CAS,

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 $\pm$ sd age, 65.8 $\pm$ 11.6 years). Among FES patients there were 1015