

Indications for carotid endarterectomy (CEA) of symptomatic and asymptomatic internal carotid artery (ICA) stenosis were based on numerous randomised studies. The benefit was rated relative to the lowered risk of ipsilateral stroke relapse. There is evidence that rCBF correlates with brain electrical activity (EEG, SEPs). Somatosensory function is represented by evoked neuronal activity in central region. Can the neuronal activity in primary somatosensory cortex be influenced by hypercapnia-induced increased rCBF or CEA in patients with ICA stenosis or is a change such as that permanent? The aim of the present study was to determine whether CEA in unilateral symptomatic stenosis in the extracranial vascular system had a bearing on neuronal activity in the central region of the cerebral cortex.

### **Material and methods**

The criteria for enrollment in the study were a history of ischaemic insult (TIA, RIND, minor stroke) less than six weeks before admission and unilateral stenosis of the ICA of 70-99 % measured on the DSA with the NASCET method. Patients were divided into two groups: **Group A** (28 men and 13 women) with their initial NIHSS  $\leq 2$ . **Group B** consisted of 12 men and 5 women, starting NIHSS was from 3 to 8. All patients were examined before CEA, on post-operative days 3-7 and 3 months after CEA. SEPs and TCD were recorded under three phases: at rest, during hypercapnia and at rest following hypercapnia. N20 latency, N20/P25 amplitude and AUC 15-100 were measured through SEPs, PSV,  $V_{\text{mean}}$  and PI in the MCA through TCD examination.

### **Results**

There was a highly significant increase in PSV and  $V_{\text{mean}}$  and decrease in PI in all examination in both groups ( $p < 0.015$ ). Amplitude N20/P25 significantly decreased during hypercapnia before and early after CEA ( $p = 0.05$ ) in group A. CEA significantly influenced PSV in group A and PI in both groups ( $p > 0.05$ ).

### **Conclusion**

- 1) There was not proved significant abnormality in cohort with unilateral symptomatic ICA stenosis 2-6 weeks after ischaemic stroke using scalp median SEP. Neither absolute values, nor N20/P25 amplitude symmetry and N20 latency changed significantly neither after CEA nor 3 months later.
  - 2) There was not found significant increase of neuronal activity of central region on symptomatic side after induced vasodilation using hypercapnia. There was not found statistically significant increase of N20/P25 amplitude during hypercapnia. There was reached only statistically significant decrease of N20/P25 amplitude only in group A.
  - 3) There was not documented consistent increase of electrical activity of cortical neurons on symptomatic side in scalp median SEP signal. Three months after CEA median SEP did not significantly differ from preoperative values..
- Under human conditions, in a state of unilateral symptomatic high grade extracranial ICA stenosis ( $\geq 70\%$ ), no haemodynamic compromise was detected.