

Association of Biomarker of Cerebral Injury – NSE and Cerebral Oximetry with Neurological Changes During Carotid Endarterectomy Performed in Awake Patients

Anita Resman¹, Matej Makovec

¹University Clinical Centre Ljubljana, Clinic od Neurology, Ljubljana, Slovenia, ²University Clinical Centre Maribor, Department of vascular surgery, Maribor, Slovenia

BACKGROUND: The aim of this pilot investigation was to determine if a raised serum NSE (neuron-specific enolase) level or a decrease in rSO₂ following carotid revascularization with CEA (carotid endarterectomy) could be used to detect neurological instability in CEA patients. We hypothesised that increased serum NSE levels during CEA would be linked to neurological symptoms after surgery.

PATIENTS AND METHODS: A total of 64 consecutive CEAs were prospectively evaluated in 60 patients who underwent the procedure under LA (local anaesthesia) during an 18-month period. The cerebral oximeter was used to measure cerebral oxygen saturation (rSO₂) before and after cross-clamping, along with the serum concentration of NSE. Selective shunting was performed when neurological changes occurred, regardless of rSO₂.

RESULTS: The neurological symptoms that occurred after clamping correlated with a less pronounced decrease in the serum level of NSE ($P = .026$) during the 12-hour timeframe after the procedure. The cut-off of 13.1% of NSE decrease was determined to be optimal for identifying patients with neurological symptoms. There was no correlation between rSO₂ decline and neurological symptoms ($P = .675$). Two (3.1%) perioperative strokes occurred.

CONCLUSION: Awake neuromonitoring has been found to be a sensitive and direct evaluation method for brain tissue perfusion and is specific to CEA under LA. Although there was a favorable correlation between CEA and a change in serum NSE, serum NSE monitoring was not practicable due to postponed statistically significant change (12 hours after the procedure).