POVEZAVA MED BIOKEMIČNIM OZNAČEVALCEM S100B IN OKSIGENACIJO MOŽGANOV TER NEVROLOŠKO SIMPTOMATIKO MED KAROTIDNO ENDARTERIEKTOMIJO PRI BUDNIH BOLNIKIH

ASSOCIATION OF BIOMARKER S100B AND CEREBRAL OXIMETRY WITH NEUROLOGICAL CHANGES DURING CAROTID ENDARTERECTOMIES PERFORMED IN AWAKE PATIENTS

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POVZETEK

Izhodišče: Eden glavnih vzrokov za možgansko-žilni dogodek med karotidno endarteriektomijo (KE) je manjši pretok skozi možgane med pretisnjenjem vratne arterije. Takojšnja in pravilna prepoznava nezadostnega kolateralnega pretoka je ključna za dober izhod operativnega posega. Splošna uporaba začasnega žilnega obvoda (šanta) med operativnim posegom poveča zahtevnost operacije, lahko poškoduje žilno steno, kar vodi v tromboembolizme. Iz tega izhaja, da potrebujemo nevromonitoring, ki bi selekcioniral bolnike, ki bodo imeli korist od vstavitve šanta. V študiji smo proučevali tako povišane serumske koncentracije biokemičnega označevalca možganske poškodbe, proteina S100B kakor tudi padec oksigenacije v možganih (rSO_2) pri budnem operirancu, ki smo ga nevrološko nadzorovali (1, 2).

Bolniki in metode: V študijo je bilo vključenih 60 operirancev, pri katerih smo v obdobju 12 mesecev opravili 64 KE v LA. Spremljali smo rSO_2 in S100B pred pretisnjenjem karotidne arterije in po njem. Za vstavitev šanta smo se odločili glede na nevrološko simptomatiko med KE, ne glede na rSO_2. Nevrološka simptomatika (nevrološko simptomatska skupina) se je pojavila pri sedmih (10,9 %) operirancih. Pri 57 (89,1 %) operirancih med posegom ni bilo pojava nevrološke simptomatike (nevrološko asimptomatska skupina).

Rezultati: Nevrološka simptomatika, ki se je pojavila po pretisnjenju karotidne arterije, je korelirala s povišano serumsko koncentracijo S100B (P = 0,040). Optimalno povišanje serumske koncentracije proteina S100B, ki napoveduje pojav nevrološke simptomatike, je 22,5 %. Korelacije med padcem rSO_2 in pojavom nevrološke simptomatike (P = 0,675) nismo našli. Dva operiranca (3,1 %) sta utrpela perioperativno MK.

Zaključek: Nevrološki nadzor operirancev med KE je možen pri posegih v LA. Izkazalo se je, da je dober kazalnik prekrvitve možganov med posegom. Čeprav smo med KE ugotovili povezavo med pojavom nevrološke simptomatike in porastom serumske koncentracije S100B, spremljanje S100B z namenom nevromonitoringa med KE ni možno zaradi dolgega časa analize vrednosti S100B v serumu.

Ključne besede: nevromonitoring, preprečevanje perioperativne možganske kapi, selektivna vstavitev šanta, zožitev karotidne arterije

SUMMARY

Background: One of the major causes of cerebrovascular accidents during a carotid endarterectomy (CEA) is hypoperfusion during cross clamping of the internal carotid artery (ICA). The prompt and reliable recognition of insufficient collateralisation is crucial for a good neurological outcome in patients. General use of an indwelling shunt adds to the complexity of the endarterectomy, and it can injure the artery, leading to thromboemboli. Therefore, proper neuromonitoring is needed to identify patients who will benefit from shunt placement. The aim of this preliminary study was to investigate whether increased serum S100B levels or a drop in cerebral oxygen saturation (rSO_2) during carotid revascularisation by CEA could be used to detect neurological instability in patients undergoing CEA (1,2).

Patients and methods: A total of 64 consecutive CEAs in 60 patients operated under LA during a 12-month period were prospectively evaluated. A cerebral oximeter was used to measure rSO_2 before and after cross clamping along with the serum concentration of the S100B protein. Selective shunting was performed when neurological changes occurred, regardless of rSO_2. Neurological deterioration occurred (neurological symptoms group) in seven (10.9%) operations. In 57 (89.1%) operations, the patients were neurologically stable (no neurological symptoms group).

Results: The neurological symptoms that occurred after clamping correlated with an increase in the serum level of S100B (P = .040). The cut-off of 22.5% of S100B increase was determined to be optimal for identifying patients with neurological symptoms. There was no correlation between rSO_2 decline and neurological symptoms (P = .675). Two (3.1%) perioperative strokes occurred.

Conclusions: Awake neuromonitoring is inherently specific for CEA under LA and has been shown to be a sensitive direct measure of cerebral tissue perfusion. Although positive association was identified between neurological symptoms during CEA and serum S100B protein increase, the monitoring of serum S100B during CEA cannot be performed because of the long evaluation time.

Key words: carotid stenosis, neuromonitoring, perioperative stroke prevention, selective shunting

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