EFFECT OF CAROTID REVASCULARISATION ON CEREBRAL AUTOREGULATION IN COMBINED CARDIAC SURGERY

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Objectives: Combined carotid artery endarterectomy (CEA) and CABG surgery is considered to reduce long-term stroke risk for patients with severe carotid artery stenosis. The benefits of CEA for improving cerebral perfusion during subsequent cardiopulmonary bypass (CPB) are unclear. We hypothesised that combined CEA and cardiac surgery results in improved cerebral blood flow autoregulation compared with patients undergoing cardiac surgery with uncorrected carotid stenosis.

Methods: Cerebral autoregulation was monitored continuously in 257 patients with the cerebral oximetry index (COx). COx represents moving Pearson’s correlation coefficient between changes in regional cerebral oxygen saturation and mean arterial pressure that has been validated in previous investigations. Impaired autoregulation was defined as value of COx ≥ 0.3.

Results: Nineteen patients had prior CEA, 8 patients underwent combined cardiac surgery and CEA, 8 patients had uncorrected carotid stenosis >70%, and 100 patients had carotid stenosis <50%. Patients with carotid stenosis of >70% had higher COx compared to patients without significant stenosis [0.26, interquartile range (IQ) (0.18–0.33) vs 0.18, IQ (0.07–0.27), P = 0.054] before CPB (Fig. 1). During CPB, COx was higher compared with baseline for all patients except those undergoing CEA before cardiac surgery [0.28, IQ (0.23–0.37) vs 0.25, IQ (0.02–0.46), P = 0.56]. Only patients with uncorrected carotid stenosis had average COx of more than 0.3 during CPB indicative of impaired autoregulation.

Conclusion: Patients with uncorrected carotid stenosis have evidence of impaired autoregulation during CPB. In contrast, patients undergoing CEA prior to subsequent cardiac surgery have more preserved cerebral autoregulation.