LETTER TO THE EDITOR

Issues related to increased systemic perfusion pressure during cardiopulmonary bypass and its safety

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We read with great interest the article by Siepe et al. [1] ‘Increased systemic perfusion pressure during cardiopulmonary bypass (CPB) is associated with less early postoperative cognitive dysfunction and delirium’ along with the conference discussion with Dr Pepper.

This prospective, randomized, single-center trial sought to find differences in cognitive outcome after elective or urgent coronary artery bypass grafting (CABG) surgery based on the different systemic perfusion pressures during CPB.

On surprisingly low number of patients authors were able to prove statistically significant difference with regard to occurrence of postoperative delirium and concluded that elevated perfusion pressure is not associated with increased morbidity and mortality.

We have a few remarks regarding the study and the interpretation of the results.

(1) It is well known that cognitive outcome is best measured using few cognitive tests rather than one [2]. Perhaps using more tests would find subtle differences in both groups compared with baseline values.

(2) You excluded 28 patients (21%) before randomization based on the history of cerebrovascular disease. Did you screen all the patients who came for surgery and can you comment on the extent of the disease (e.g. degree of carotid stenosis, history of CVA) as exclusion criteria?

(3) Single clamp versus side clamping of the aorta influences neurological outcome following cardiac surgery [3]. It is not clear which technique was employed.

(4) Seventy percent of patients in high perfusion group (HP) compared with 50% in low perfusion group received blood product transfusion almost reaching statistical significance ($P = 0.056$). This could present potential bias if the timing of blood transfusion has occurred during CPB and affected cerebral oxygen supply.

(5) Although not significantly different 7% of reoperations for bleeding in HP group seems a bit high and requires caution in recommending higher perfusion pressure.

(6) Neurocognitive outcome following CABG procedure depends on cerebral oxygen delivery and blood supply [4]. Former can be monitored by near-infrared spectroscopy (NIRS). It would be interesting to see the data regarding the number and length of periods of desaturation measured with NIRS and their correlation with the delirium.

Position of the vascular cannula, perfusion pressure, arterial oxygen content, partial pressure of carbon dioxide (during CPB), hemoglobin, cardiac output and the cerebral metabolic rate of oxygen all affect the balance between cerebral oxygen delivery and consumption [5]. Interventions other than increased perfusion pressure alone are available to improve cerebral perfusion and neurocognitive outcome.

REFERENCES


