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Intraoperative hypotension and postoperative stroke in older patients who had brain tumour resections: a retrospective cohort analysis

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Abstract

Background: At some level intraoperative hypotension causes strokes. Elderly neurosurgical patients are presumably at especially high risk. We therefore tested the primary hypothesis that intraoperative hypotension is associated with postoperative stroke in older brain tumour patients.

Methods: We considered patients more than 65 years old who had elective craniotomy for tumour resections. Our primary exposure was the area under the threshold of intraoperative hypotension. The primary outcome was newly diagnosed ischemic stroke within 30 days, confirmed by scheduled brain imaging.

Results: Among 724 eligible patients, 98 (13.5%) had strokes within 30 days after surgery, 86% of which were clinically silent. Curves of lowest mean arterial pressure versus stroke incidence suggested a threshold at 75 mmHg. Area under thresholds of mean arterial pressure below 75 mmHg was therefore incorporated into multivariable modelling. There was no association of area below 75 mmHg and stroke (adjusted odds ratio [aOR], 1.00; 95% CI, 1.00 to 1.00). The aOR for area below 75 mmHg between 1 to 148 mmHg*min, was 1.21 (95% CI, 0.23 to 6.23). When the area below 75 mmHg exceeding 1117 mmHg*min, the association remained insignificant. In contrast, malignant tumour and history of previous stroke or myocardial ischemia were associated with strokes.

Conclusions: Postoperative strokes were common in older patients who had brain tumour resections, with about 14% having ischemic cerebrovascular events within 30 days - of which 86% were clinically silent. Malignant brain tumours and previous ischemic vascular events were associated with postoperative strokes, but area under 75mmHg was not.

Keywords: Anaesthesia; brain tumour; intraoperative hypotension; postoperative stroke.

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