Association of electroencephalogram trajectories during emergence from anaesthesia with delirium in the post-anaesthesia care unit: an early sign of postoperative complications.

Hesse S, Kreuzer M, Hight D, Kreuzer M, Hight D, Gaskell A, Devari P, Singh D, Taylor NB, Whalin MK, Lee S Sleight JW, Garcia PS. British Journal of Anaesthesia, 2018, https://doi.org/10.1016/j.bja.2018.09.016.

Background

Postoperative delirium is associated with an increased risk of morbidity and mortality, especially in the elderly. Delirium in the post-anaesthesia care unit (PACU) could predict adverse clinical outcomes.

Methods

We investigated a potential link between intraoperative EEG patterns and PACU delirium as well as an association of PACU delirium with perioperative outcomes, readmission and length of hospital stay. The risk factors for PACU delirium were also explored. Data were collected from 626 patients receiving general anaesthesia for procedures that would not interfere with frontal EEG recording.

Results

Of the 626 subjects enrolled, 125 tested positive for PACU delirium. Whilst age, renal failure, and pre-existing neurological disease were associated with PACU delirium in the univariable analysis, the multivariable analysis revealed the importance of information derived from the EEG, anaesthetic technique, anaesthesia duration, and history of stroke or neurodegenerative disease. The occurrence of EEG burst suppression during maintenance [odds ratio (OR)=1.86 (1.13–3.05)] and the type of EEG emergence trajectory may be predictive of PACU delirium. Specifically, EEG emergence trajectories lacking significant spindle power were strongly associated with PACU delirium, especially in cases that involved ketamine or nitrous oxide [OR=6.51 (3.00–14.12)]. Additionally, subjects with PACU delirium were at an increased risk for readmission [OR=2.17 (1.13–4.17)] and twice as likely to stay >6 days in the hospital.

Conclusions

Specific EEG patterns were associated with PACU delirium. These findings provide valuable information regarding how the brain reacts to surgery and anaesthesia that may lead to strategies to predict PACU delirium and identify key areas of investigation for its prevention.