Influence of depth of anaesthesia on postoperative cognitive dysfunction (POCD) and inflammatory marker

av

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Akademisk avhandling

Avhandling för medicine doktorsexamen i medicinsk vetenskap med inriktning kirurgi, som kommer att försvaras offentligt
Fredag den 7 februari 2014 kl. 08.45,
Campus C2 Universitetssjukhuset Örebro

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Abstract

Pether Jildenstål (2014): Influence of depth of anaesthesia on postoperative cognitive dysfunction (POCD) and inflammatory marker. Örebro Studies in Medicine 101.

Patients may suffer from various forms of postoperative cognitive dysfunction (POCD). In most cases, the impact on cognitive function is relatively transient but POCD can sometimes be long-lasting (> 1 year). Studies showing that up to one in four patients with known risk factors are affected by some form of cognitive loss. The cause of cognitive impairment after surgery and anaesthesia is still unclear. One hypothesis is that anaesthetic drugs may have an impact on the inflammatory process which occurs in conjunction to the tissue trauma caused by surgery. Titrating anaesthetic administration by the use of a depth of anaesthesia (DOA) monitors (AEP or BIS), usually reduce anaesthetic consumption and facilitate early recovery. In the initial two studies, the EEG-based DOA monitoring (AEP) was compared with a control group with standard monitoring for administration of anaesthesia. The AEP group required less anaesthetics and opioids and had faster early recovery but was also associated with a lower number of patients with < 25 MMSE score at 24-hours. We found in study III a relationship between the DOA and postoperative inflammatory response (IL-6). Patients with < 25 MMSE score had higher postoperative 24-hrs IL-6 levels. In the final study, we investigated the attitudes and knowledge among Swedish anaesthesiologists and nurse anaesthetists including the use of DOA, and to what extent written procedures regarding the pre-and postoperative cognitive dysfunction were used.

In conclusion, our studies show, the EEG-based guided DOA monitoring reduces consumption of anaesthetics and opioids during surgery, allows a faster postoperative recovery, and reduces the occurrence of cognitive impairment the first day after surgery and decrease inflammatory response after eye surgery. We found also an association between perioperative DOA, cognitive impairment and an increased inflammatory response after surgery. The interest and knowledge about assessment and management of neurocognitive side-effects before and after anaesthesia was found to be low among anaesthesiologists and nurse anaesthetists. They were critical about the benefits of the DOA monitoring. Swedish anaesthesiologists and nurse anaesthetists need to improve their knowledge of assessment and management of cognitive dysfunction.

Keywords: Postoperative cognitive dysfunction, minor and major surgery, anaesthesia, depth of anaesthesia monitoring, auditory evoked potential, AAI, inflammatory marker.

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