

**Cardiopulmonary adverse events during procedural sedation in patients with obstructive sleep apnoea: a systematic review and meta-analysis**

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## Abstract

Obstructive sleep apnoea in surgical patients is associated with cardiac and respiratory complications in the peri-operative period. Agents commonly administered for procedural sedation, such as hypnotic-sedatives, benzodiazepines and opioids can cause respiratory depression and muscle relaxation, and lead to loss of upper airway patency and finally to airway collapse. However, there is limited evidence supporting an increased risk of peri-operative adverse events in the obstructive sleep apnoea population receiving procedural sedation and analgesia for diagnostic or therapeutic medical procedures. The objective of the systematic review presented in this thesis was to identify, assess and synthesise the available evidence on cardiac and respiratory complications during propofol, midazolam and fentanyl sedation administration and diagnosed obstructive sleep apnoea.

A comprehensive search for relevant studies published in the English language was conducted using PubMed/MEDLINE, CINAHL, EMBASE, Scopus and relevant sources of grey literature. Four thousand and twenty eight citations were screened to determine eligibility with 80 records retrieved for detailed examination of the full text. Five studies matched the eligibility criteria for the review and underwent critical appraisal by two reviewers using the Joanna Briggs Institute – Meta Analysis of Statistics, Assessment and Review Instrument. Where possible, data was analysed using RevMan 5.3 software using a random effects model.

Five studies reported on sedation associated complications in patients with confirmed obstructive sleep apnoea undergoing gastrointestinal endoscopy. No studies conducted on patients undergoing other procedures were identified. The total number of participants included in the studies was 1826 (n=1079, obstructive sleep apnoea group; n=747, non-obstructive sleep apnoea group). Meta-analysis revealed no significant association between diagnosis of obstructive sleep apnoea and cardiopulmonary complications during procedural sedation with midazolam, fentanyl or propofol, including oxygen desaturation odds ratio (OR) 0.84 (95% CI: 0.47-1.47; five studies); hypotension OR 0.95 (95% CI: 0.55-1.63; three studies), bradycardia OR 0.85 (95% CI: 0.58-1.25; two studies); tachycardia OR

0.74 (95% CI: 0.43-1.29; two studies) and complications requiring intervention OR 1.23 (95% CI: 0.64-2.37; four studies).

Despite the lack of association between confirmed obstructive sleep apnoea and increased risk of cardiopulmonary adverse events, the limitations arising from the multiple gaps in the reporting of the studies (notably with regard to patient characteristics and outcome measurements) and the representativeness of the OSA population (OSA patients undergoing only endoscopic procedures), limit the extent to which the results can be generalised.

## **Declaration**

I, Ella Gagolkina, certify that this work contains no material which has been accepted for the award of any other degree or diploma in my name, in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published or written by another person, except where due reference has been made in the text. In addition, I certify that no part of this work will, in the future, be used in a submission in my name, for any other degree or diploma in any university or other tertiary institution without the prior approval of the University of Adelaide and where applicable, any partner institution responsible for the joint-award of this degree.

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