



Is obstructive sleep apnea related to postoperative delirium, postoperative coma or both?

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Obstructive sleep apnea (OSA) is a medical disorder strongly associated with multiple comorbidities and postoperative complications (1). Several studies have examined the potential association between OSA and delirium. In 2012, the presence of OSA was found to be independently associated with the occurrence of delirium after knee replacement surgery (2). In that study, delirium was assessed on postoperative days 2 and 3 using the standardized delirium scale from *Diagnostic and Statistical Manual of Mental Disorders-IV*, and the occurrence of OSA was confirmed based on polysomnography records. In 2014, a prospective cohort study strongly associated delirium with preoperative sleep-disorder breathing (SDB) after cardiac surgery, which in some cases was actually undiagnosed OSA, and the study suggested that SDB may be a risk factor for postoperative delirium (3). That study assessed SDB by measuring the mean number of apneas and hypopneas per hour, allowing for the calculation of the apnea-hypopnea index (AHI); delirium was assessed during the first 4 postoperative days using the Confusion Assessment Method. In contrast, a 2018 prospective study found no association in thoracic surgery patients between preoperative OSA risk as assessed using the STOP-BANG questionnaire and postoperative delirium as assessed using the Confusion Assessment Method for the intensive care unit (ICU) (4). Although they found no significant difference in the

delirium incidence between those with intermediate-high or low risk of OSA, they did find that postoperative delirium and coma lasted longer in those patients at intermediate/high risk. They also found that patients with intermediate-high preoperative OSA risk were more than 3 times as likely to develop both postoperative delirium and coma.

These inconsistencies may reflect differences in how preoperative OSA and postoperative delirium are diagnosed. For example, the STOP-BANG questionnaire, which includes 8 items (snoring, day time tiredness, observed apnea, hypertension, BMI >35 kg/m², age >50 years, neck circumference ≥40 cm, male sex), can predict OSA risk as a form of presumptive diagnosis, but one clinical trial found that it was a poor predictor of OSA severity, as measured by residual AHI (5). We recommend that predictive scales applied in studies of the potential relationship between OSA and postoperative delirium should be compared with OSA diagnosis by polysomnography. It may be that preoperative OSA, but not STOP-BANG score, is associated with postoperative delirium.

More studies are needed on the potential association between OSA and postoperative coma. One comparison of intensive care unit patients found that OSA was significantly associated with the combined outcome of postoperative delirium and/or coma, but not with the individual outcomes of delirium or coma on their own (6). Delirium or coma on

their own, or the simultaneous presence of both (leading to acute brain dysfunction), lengthens time to extubation in mechanically ventilated patients (7), prolongs stay in the ICU and hospital (8), and increases mortality among critically ill patients in the ICU (9). It is possible that analyzing the combined outcome of delirium and/or coma may allow a more accurate assessment of whether OSA is associated with acute changes in cognitive state.

In this light, we applaud recent work analyzing the relationship between preoperative STOP-BANG score and the combined outcome of postoperative delirium and/or coma in thoracic surgery patients (4). At the same time, we encourage future work in this area to include assessments of patients who experience postoperative coma only, and to include data on pain, opioid use, and other sedatives, which can worsen the adverse effects of OSA. Continuing research is needed to elucidate potential links of preoperative OSA with delirium, coma, and the combined outcome of delirium and/or coma after different types of surgery.

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Footnote

Conflicts of Interest: The authors have no conflicts of interest to declare.

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