Screening for OSA in Surgical Patients

Surgical patients at risk

It has been estimated that from 3-7% of the general population has obstructive sleep apnea (OSA). However, the prevalence of OSA among those undergoing surgery is higher, and specific surgical populations are at particularly high risk. In the bariatric surgery population, for example, more than 70% of patients have been found to have OSA.

Why are surgical patients at risk?

Anesthetics and opioid-based analgesics depress the central nervous system, causing:

- Upper airway instability,
- Decreased neural stimulus to breathe
- Inhibited arousal response

These side effects may lead to hypoxia and an increase in observed obstructive apnea events, exacerbating the effects of OSA. Additionally, these sedatives and pain medications can prevent the person from waking up, resulting in severe oxygen desaturations or even respiratory arrest.

A phenomenon known as “REM sleep rebound” is also associated with surgery. Anesthesia, the trauma of surgery, and the use of opioids usually disturb a patient’s sleep in the days following surgery. In particular, REM sleep is usually not present in the first few days after surgery. This leads to REM sleep rebound in the third or fourth day after surgery, in which the body responds to the previous lack of REM sleep by entering REM sleep for longer periods of time. Since many OSA patients have more respiratory events during REM sleep, this phenomenon can increase the risk of postoperative complications in patients with OSA.

What are the risks?

Given the above factors, it would be expected that patients with OSA have more perioperative complications than those without OSA, and this is indeed the case. One study found that those without OSA have an 18% risk of postoperative complications, while those with OSA have a 39% risk.

OSA patients were also transferred to the ICU 24% of the time, while non-OSA patients were transferred 9% of the time. Patients with sleep apnea also had longer hospital stays. It was also found that treatment with continuous positive airway pressure (CPAP) prior to surgery can reduce the risk of complications among OSA patients.

Screening for Sleep Apnea before Surgery

In addition to improving patient outcomes, screening for and treating OSA prior to surgery can have financial implications for hospitals and healthcare providers. For example, if an OSA patient has a postoperative complication, an insurance company may refuse payment on the grounds that it could have been avoided with CPAP treatment prior to surgery. Screening and timely therapeutic intervention can help healthcare providers avoid non-payment for these types of unexpected medical events.

Other benefits of screening can be found in improved audits and sources of additional revenue for providers. Screening can improve outcomes of CMS recovery audits, as it can be shown that every effort was taken to avoid postoperative complications. Additionally, the diagnosis and treatment itself can increase revenue. In lab polysomnogram (PSG) testing or home sleep testing (HST) can generate additional income, as can the equipment used to treat apnea (DME).

How to screen for OSA

Due to the low cost, a questionnaire can be completed by all pre-surgical patients. The STOP-BANG questionnaire is well researched, free, and simple to use. The STOP-BANG questionnaire consists of eight questions, for which the phrase ‘STOP-BANG’ is a mnemonic device. The questions included can be seen in the following diagram:

### Stop-Bang Sleep Apnea Questionnaire

1. Snoring: Do you wake up feeling tired? (Is it louder than talking or loud enough to be heard through a closed door?)
2. Fixed: Do you have a hard time going to sleep or falling asleep?
3. Observed: Has anyone observed you stop breathing during sleep?
4. Blood pressure: Do you have or are you being treated for high blood pressure?
5. BMI: BMI over 35 kg/m²? (Obese)
6. Age: Are you over 50 years old?
7. Neck circumference: Neck circumference greater than 45 cm?
8. Gender: Gender male?

**High risk of OSA: answering yes to three or more items**

**Low risk of OSA: answering yes to less than three items**

*“sensitivity varied from 76% to 96%, and the specificity ranged from 13% to 54%”—ie, it will pick it up but lots of other things can cause those problems like restless legs*

However, because such questionnaires have a low level of specificity with regard to the severity of apnea, it is useful to further screen those who are high risk using overnight high resolution pulse oximetry. It has been shown that the rate of postoperative complications is increased in proportion to episodes of desaturation during oximetry.
Perioperative Management of OSA Patients

Before surgery, there are steps one can take to improve outcomes for patients with OSA. If a patient is already using CPAP or has been diagnosed with moderate to severe OSA, then using CPAP before surgery could be helpful. Another option, if feasible, would be to have the patient lose weight before the surgery. Since patients with OSA are at risk for increased airway instability, it is also recommended to use the American Society of Anesthesiologists Practice Guidelines for Management of the Difficult Airway.

During surgery, healthcare providers should keep the presence of OSA in mind when choosing the method of anesthesia. For superficial procedures, local anesthesia or peripheral nerve blocks may be a better choice. It is also recommended to monitor the CO2 levels of patients under sedation. Administering CPAP or Oral Appliance Therapy to patients who have previously used such treatments should also be considered. It is recommended that patients at risk for OSA should be extubated while awake and upright, if possible.

Patients with OSA are most likely to have complications after surgery, due to the presence of REM sleep rebound. When possible, regional anesthetic techniques should be used instead of systemic opioids. Supplemental techniques should be used instead of systemic opioids. Supplemental oxygen should be administered until the patient is able to maintain their baseline O2 level with room air. CPAP should be administered to patients who were using CPAP therapy previous to the surgery. Oximetry should be continuously monitored, either in a step-down unit or via telemetry. Pulse oximetry should be applied until the patient’s O2 saturation with room air remains above 90%.

Conclusion

A large number of patients undergoing surgery will have undiagnosed OSA. Screening patients using a combination of the STOP-BANG questionnaire, pulse oximetry and a review of medical records will help identify patients who are at high risk for moderate to severe OSA. Steps can then be taken to properly manage such patients before, during and after surgery in order to improve outcomes. Once surgery is complete and the patient has recovered, HST or PSG can be conducted in order to diagnose the patient for year-round treatment of OSA, if appropriate.

References