peri-operative care series

Obstructive sleep apnoea (OSA) is a common and significant health problem that is under-reported and undiagnosed in up to 80% of patients. The most common reason for this is that patients are often unaware of their heavy snoring and night-time arousals, and it is the partner that provides this crucial clue to the diagnosis.

Despite growing evidence of an association between OSA, obesity and cardiovascular disease it is surprising how little surgeons are aware of this condition and its potential complications for our patients. Patients with OSA also have many of the 'core' components of the metabolic syndrome, including high blood pressure, high fasting glucose, increased waist circumference, low HDL [high-density lipoprotein] chole-

sterol, hypercoagulability, and insulin resistance – all of which increase the risk of developing postoperative complications.¹

Dr Simon Wharton is a consultant in sleep medicine at Nottingham University Hospitals NHS Trust and has written a thought-provoking and important article reminding surgeons of all specialties to be aware of OSA.

JYOTI SHAH
Associate Editor

Reference

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Sleep apnoea and the surgical list

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Question

A 58-year-old slightly overweight man presents for assessment for a total knee replacement. His wife asks whether it could be done under 'local' as he often stops breathing while he is asleep. What should you do next?

Obstructive sleep apnoea (OSA) is a common disorder. It causes disabling daytime somnolence and is associated with an increased rate of peri and post-operative complications. Should a history of OSA be routinely sought at pre-admission clerking?

The first description of OSA was published in 1956 and the first effective treatment described as recently as 1981. Since then the signs and symptoms of the disorder have been recorded and the methods of investigating and treating it have been explored. Between 4% and 24% of the adult population of the United States have some degree of sleep apnoea. To put that figure into perspective, the prevalence of diabetes in the adult population in the US is thought to be around 11%. OSA is also more prevalent in certain populations:¹

- > 36% of diabetics
- > 38% of hypertensive patients

- > 45% of patients with untreated hypothyroidism
- > 83% of patients with resistant hypertension
- > 32% of patients with body mass index (BMI) greater than 31kg/m²

The prevalence of OSA is approximately 9.5% in the general surgical population but rises to 75–90% of patients awaiting bariatric surgery.² It would therefore be easy to consider OSA a disorder of obesity. However, while it is true that increasing weight is a strong risk factor for developing it, only considering the diagnosis in the presence of obesity would risk missing OSA in a significant number of patients. In the Sleep Heart Health Study, 16% of patients with sleep-disordered breathing had a BMI of less than 25 and 34% had a BMI of less than 30. OSA in slim patients tends to be due to the presence of anatomical factors such as retrognathia, large tonsils, a large tongue, a narrow high-arched palate or a difficult airway, which predisposes them to upper airway collapse at night.

The triad of snoring, witnessed apnoeas (complete cessation of breathing for at least 10 seconds) and daytime somnolence make up the cardinal symptoms of OSA but other symptoms (Table 1) and signs have been noted (Table 2).

Table 1 Symptoms associated with OSA

- > Morning headaches
- > Nocturia
- > Dry mouth (especially in the mornings)
- > Tooth grinding
- > Mood swings
- > Night sweating
- > Sore throat
- > Erectile dysfunction

Pre-operative considerations

Identifying patients at risk of OSA relies on non-specific symptoms and signs. However, questionnaires such as the Berlin questionnaire can be used to screen outpatients. The STOP-BANG⁵ questionnaire was developed specifically for use in the perioperative setting and relies on a simple mnemonic (Table 3). It identifies patients likely to have OSA with a sensitivity of 66%–79%.

Overnight oximetry will diagnose significant OSA quickly and cheaply with a reasonable degree of accuracy by identifying desaturations ($\text{PaO}_2 < 80\%$). Although there are alternative treatments, continuous positive airway pressure (CPAP) remains the most effective therapy for OSA and improvements in daytime somnolence and physiological measures can occur within 24 hours of starting treatment.

Peri-operative aspects

1. Sedatives may relax the upper airway, thereby increasing the risk of collapse.
2. Use of an anxiolytic may reduce the dose of anaesthetic.
3. Pre-oxygenate the patient for at least 3 minutes before intubation.
4. Ensure equipment for management of a difficult airway is readily available.
5. Upper airway collapse is also more likely in the supine position – the anaesthetist may wish to intubate in theatre using the ‘deckchair’ position if that facility is available on the operating table. This also prevents small airway collapse and reduction in functional residual capacity in the obese patient.
6. Ensure that intra-operative analgesia is optimised with use of opioid sparing techniques such as local anaesthetic wound infusions, nerve blocks and neuroaxial blockade (spinal or epidural) where appropriate.

Post-operative considerations

Research into the post-operative effects of untreated OSA have largely been dominated by retrospective studies of low quality, and case reports. However, evidence suggests that OSA can increase the rate of post-operative respiratory complications⁴ and cardiac arrhythmias,⁵ and patients with untreated OSA have longer post-operative intensive care unit and total hospital lengths of stay.⁶ Consensus documents have therefore recommended post-operative moni-

Table 2 Signs associated with OSA

- > High-arched palate
- > Nasal polyps
- > Enlarged turbinates
- > Oedematous uvula
- > Large tonsils
- > Collar size greater than 17'
- > Mallampati grade-3 or 4 airway (ask patients to open their mouth as wide as they can, protrude their tongue and say 'ah'. If you can only visualise the base of the uvula, rather than the full pharyngeal anatomy, the patient has a grade-3 view. A grade-4 view is when only the hard palate is visible. This test also identifies patients with a potentially difficult airway. The anaesthetist should be alerted to this pre-operatively.)

toring either in recovery or surgical high-dependency unit (HDU) to minimise these risks.⁷

1. Patients should be extubated only when conscious and breathing spontaneously.⁷
2. Administer 250mg methylprednisolone at induction of anaesthesia to avoid swelling of the pharynx post-operatively.
3. 0.15mg clonidine can be infused 20 minutes prior to the end of surgery to avoid hypertension (also mild sedative).
4. Use alternatives to opioid analgesia as opioids increase the risk of respiratory depression.
5. Many patients with OSA stop CPAP perioperatively for a number of reasons: pain, anxiety, agitation, nasogastric feeding tube or failure of the hospital to resume it post-operatively.
6. It may be necessary to transfer the patient to the intensive therapy unit or HDU, especially after nasal surgery where obstruction of the upper airway may be present from nasal packs, oedema or haematomas.

Obstructive sleep apnoea is a common condition, with both short-term consequences for the patient, such as daytime somnolence, and long-term consequences of increased cardiovascular morbidity and mortality. It is associated with increased post-operative complications. Given its prevalence it is highly likely that patients with undiagnosed OSA will present for surgery but a history suggesting the diagnosis can easily be obtained at pre-operative assessment. OSA can be swiftly and cheaply investigated and safe, effective treatment is readily available.

Summary

- > OSA is a common condition that is often undiagnosed in patients presenting for surgery.
- > OSA increases post-operative complications.
- > Patients at risk for OSA can be identified at pre-operative assessment.
- > Investigation and treatment are simple and effective.

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Table 3 The STOP–BANG questionnaire

- > S: Do you snore loudly?
- > T: Do you often feel tired, fatigued or sleepy during daytime?
- > O: Has anyone observed you stop breathing during your sleep?
- > P: Do you have or are you being treated for high blood pressure?
- > B: Is your BMI more than 35kg/m²?
- > A: Is your age over 50 years?
- > N: Is your neck circumference greater than 40cm?
- > G: Gender – are you male?

Three or more 'yes' answers indicates a high risk of OSA