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Perioperative Assessment and Management for Sleep Apnea in the Ambulatory Surgical Patient

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The overwhelming majority of surgical procedures performed in the United States are done on an outpatient basis. Patients with complicated medical problems are routinely scheduled for ambulatory procedures that have become progressively more complex. Appropriate patient selection is paramount to ensuring optimal perioperative outcomes, and the patient with known or suspected OSA presents unique challenges to the anesthesia care team regarding airway management, pain control, and postoperative monitoring requirements. Currently, a relative paucity of high-quality evidence exists on which to base guidelines or recommendations for the anesthetic care of these patients. It is generally agreed that early identification of those at risk for OSA allows for planning and implementation of strategies to help to reduce the risk of adverse perioperative events. Although various national societies have published consensus statements aimed at guiding the perioperative management of the patient at risk for OSA, more studies are needed to define the optimal approach to the perioperative care of this population.

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ABBREVIATIONS: AHI = apnea-hypopnea index; ASA = American Society of Anesthesiologists; $ETCO_2$ = end-tidal CO_2; HSAT = home sleep apnea test; PACU = postanesthesia care unit; PSG = polysomnogram; SAMBA = Society for Ambulatory Anesthesia; STOP-Bang = snoring, tiredness, observed apnea, high BP-BMI, age, neck circumference, and gender

Once reserved for the relatively healthy patient, ambulatory surgery is now offered to patients with increasingly complex medical histories and substantial comorbidities. In some hospitals, > 70% of all surgical procedures are performed on patients who are scheduled to be discharged on the day of the procedure.[1] Partially responsible are advances in surgical technology, including endoscopes, that have led to a decrease in the size of the incision required for many procedures. Simultaneously, developments in the pharmaceutical industry have made anesthetic medications with superior recovery profiles available.

Convenient and cost-effective, ambulatory surgery has long been considered a safe option for select patients, including those with well-controlled cardiovascular and pulmonary diseases.[2] Until recently, the perioperative care of patients with OSA was discussed only in the context of those who presented for surgery having already received a diagnosis of the disorder. It was not unusual for the patient with a formal diagnosis of OSA to routinely be transferred

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to an ICU for postoperative monitoring, regardless of the procedure. In the 1990s, Young et al[3] and Peppard et al[4] reported that undiagnosed sleep apnea was prevalent and that 82% of men and 93% of women with moderate to severe sleep apnea syndrome studied had not yet received a diagnosis. The subjects of this investigation were employed patients in the general population with no obvious barriers to either the diagnosis or treatment of sleep disorders. At the same time, Sabers et al[5] examined the impact of sleep apnea on perioperative complications, including unplanned admission, among an ambulatory surgical population undergoing nonotolaryngologic procedures in a tertiary medical center. They did not find OSA to be an independent risk factor for unanticipated admission or other perioperative adverse outcomes in patients with polysomnographic evidence of OSA.

Guidelines and Recommendations

In 2005, the American Society of Anesthesiologists (ASA) assembled a task force to review the available literature and make recommendations regarding the perioperative management of patients at risk for OSA. With a relative paucity of high-quality evidence upon which to establish recommendations, practice parameters based predominately on consensus of opinion were published in 2006.[6] The ASA checklist arose from this document and comprises questions for patients regarding signs and symptoms, which if present, according to the task force, suggest a presumptive clinical diagnosis of moderate OSA. Prior to this, a number of questionnaires to screen for the risk of OSA had been administered to patients presenting to sleep disorders clinics; however, the ASA's recommendation for use of questionnaires in the perioperative period represented a paradigm shift. Although the practice parameters contributed to the increased awareness of the possibility of undiagnosed OSA in patients presenting for surgery, they provided little guidance regarding recommendations for the extent and duration of postoperative monitoring. Additionally, the task force did not endorse ambulatory surgery for patients who screened positive for the risk of OSA, except for procedures performed under local anesthesia. This position was subsequently challenged in 2010 by data gathered in 2,193 patients undergoing ambulatory surgery at The Johns Hopkins Hospital Outpatient Center.[7] Prior to surgery, patients were given a self-administered questionnaire to determine their propensity for OSA, and adverse events were recorded. Patients with a high propensity for OSA were more challenging to intubate and required more medications for hemodynamic control; however, they did not have a higher rate of unplanned admission, reintubation, or other adverse events.

In 2012, the Society for Ambulatory Anesthesia (SAMBA) declared that the previously published ASA practice guidelines were outdated and published its own consensus statement.[8] Citing new evidence, the SAMBA task force suggested that patients with known OSA and optimized comorbidities are acceptable candidates for ambulatory surgery if they are able to use a CPAP device in the postoperative period. Furthermore, patients with a presumptive diagnosis of OSA and optimized comorbidities should likewise be considered for surgery on an outpatient basis if their pain can be managed with minimal opioids. The SAMBA statement also recommended the use of the STOP-Bang (snoring, tiredness, observed apnea, high BP-BMI, age, neck circumference, and gender) questionnaire as a preoperative screening tool as opposed to the ASA checklist.[9] The STOP-Bang prediction tool is a series of questions that addresses signs, symptoms, and anthropometric measurements to identify a patient's risk of OSA. Although a score of ≥ 3 indicates that a patient is at risk for OSA, there are proponents in favor of using a higher cut point to decrease the number of patients who screen positive but do not have the disorder. Farney et al[10] showed that in a population of patients presenting to a sleep disorders clinic, progressively higher STOP-Bang scores were associated with an increased risk of OSA. Chung et al[11] found the same in a study of patients undergoing elective surgery. Controversy remains about the determination of an optimal cut point for assigning risk. The results of surveys administered to anesthesiologists to determine practice patterns in Canada and the United States indicated that the majority of respondents polled did not favor one screening tool over another.[12,13] Additionally, only a small fraction responded that they routinely screen surgical patients for OSA despite that the majority had provided care to at least one patient who had experienced a major adverse outcome secondary to respiratory depression.

Although the pervasive failure to screen preoperatively for OSA may be partially attributed to a deficit in knowledge, it may also be due to the lack of a reliable prediction tool with an acceptable receiver operating characteristic curve.[14] Furthermore, although the ASA and the Joint Commission recommend the screening of all surgical patients for the risk of OSA, no compelling data at present support whether screening for OSA risk leads to improved outcome.