NEW RESEARCH

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COMMENTARY

The Value of Assessing Risk of Obstructive Sleep Apnea in Surgical Patients: It Only Takes One

Commentary on Stierer et al. Risk Assessment of Obstructive Sleep Apnea in a Population of Patients Undergoing Ambulatory Surgery. J Clin Sleep Med 2010;6:467-472.

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In this issue of the *Journal*, Dr. Stierer and colleagues[1] primarily seek to investigate the prevalence of diagnosed obstructive sleep apnea (OSA) and symptoms of undiagnosed OSA in a cohort of ambulatory surgical patients. Secondly they wished to characterize the frequency of postoperative complications in outpatients with a diagnosis of OSA or a high likelihood of OSA based on their questionnaire assessment tool. The questionnaire tool in this study provided a prevalence estimate of nearly 5% in these patients with a > 70% likelihood of OSA, yet there was no association between OSA propensity scores and unplanned hospital admission. There was, however, an association of increased likelihood for a difficult intubation, intra-operative use of pressors, and postoperative oxygen desaturation in the PACU. A different retrospective study of 234 outpatient surgery patients showed an odds ratio of 1.67 and 1.34 for peri-operative adverse events and unplanned hospital admissions, respectively, but not death.[2] Many hospitals are struggling with developing protocols for the nearly 35 million ambulatory surgical patients who might potentially have postoperative complications warranting prolonged observation in hospital or special precautions/treatment plans when they are discharged. Obviously all patients can not and should not be admitted whimsically without reasonable criteria lest there be an overwhelming and unnecessary hospitalization rate. The OSA prevalence level in the Stierer paper seems to be small compared to those reported in other studies in general surgery patients discussed below. The present investigation could have been influenced by a selection bias due to different exclusions perhaps applied to outpatient surgery patients who are expected to go home after the procedure versus those general surgery patients with much more frequent co-morbidities that will have higher level mandatory postoperative monitoring and in-hospital observation. The low level of postoperative complications could also have been influenced by the anesthesiologist behavior where although they were reportedly blinded to OSA questionnaire data, information could have been obtained during the routine pre-anesthetic evaluation that urged special precautions for possible OSA. This is supported by the fact that patients with increased propensity to OSA in the current investigation were more likely to receive regional versus general anesthesia and less sedation was administered.

So what might be learned from the identification of possible OSA in surgical patients? There have been other large studies that have addressed this issue and correlated the findings with postoperative consequences. The STOP-BANG (**S**noring, **T**iredness, **O**bserved apnea, and high blood **P**ressure - **B**ody mass index, **A**ge, **N**eck circumference, and **G**ender) questionnaire initially showed that when the STOP portion was used in nearly 2,500 pre-surgical patients, 28% were classified as being high risk for OSA. Subsequent PSG studies in a representative group of about 250 patients confirmed a sensitivity of 74% for predicting OSA with AHI > 15 events/hour.[3] The BANG components were added and the sensitivity level at the same AHI level increased to 93%. This group did a follow-up retrospective investigation to validate the Berlin questionnaire and the (American Society of Anesthesiologists) ASA checklist in surgical patients, and compared these with the STOP questionnaire.[4] The Berlin, ASA checklist, and STOP questionnaires similarly classified patients as high risk for OSA all with a frequency of approximately 30%, with sensitivities for OSA near 70% in the 177 cohort patients who underwent PSG. An increased number of postoperative desaturations and need for prolonged oxygen therapy were predictable if the patients were classified as being at high risk of OSA by the STOP questionnaire. Cardiac complications, need for unplanned ICU admission, or prolonged hospital stay were not predictable by any of the above questionnaire-based studies.

The Sleep Apnea Clinical Score (SACS) has been previously validated in an outpatient sleep laboratory population and has a high positive predictive value for OSA but the SACS score was subsequently shown to be capable of identifying postsurgical patients who significantly desaturated in the postoperative hospital ward area.[5] Another prospective study using the SACS in nearly 700 surgical patients predicted a higher risk of OSA in 32%, and this was associated with a much higher likelihood of recurrent post-anesthesia care unit (PACU) respiratory events.[6] There was an increased risk of respiratory complications during hospital recovery with a high SACS (odds ratio 3.5, $p < 0.001$). If they also had recurrent desaturations and other respiratory events in the PACU during 90 minutes of observation, the likelihood of a postoperative respiratory events rose very markedly (odds ratio 21.0, $p < 0.001$). Like the other questionnaires, ca-

pability of predicting cardiac complications or prolonged hospital stay with the SACS was not significant.

Returning to the data presented in this *Journal* issue, the authors concluded that even though they did not find an association between a diagnosis or higher propensity for OSA and unplanned admission or life-threatening events (e.g., reintubation, cardiac arrhythmia), there are still a substantial number of patients with unrecognized OSA that present to an ambulatory surgical center. They go on to say that this study supports the position that OSA patients may safely undergo ambulatory surgical procedures without serious complications.

Although these data and those from some of the other studies noted above support the surprisingly low number of serious complications in OSA patients that undergo outpatient or other surgical procedures, there should be a different take home lesson here. This discussion should be refocused on some different questions. In any large institution that does sufficient number of surgical procedures in patients with known OSA, there have been serious postoperative complications including in some cases, death. ***It only takes one*** unnecessary death or serious episode of anoxia to prompt reevaluation of surgical practice and mandatory hospital protocols to manage OSA patients undergoing surgery to avoid sentinel events has been on the radar screen for the Joint Commission (JCAHO).

What questions should we be addressing in future studies? I would propose we ask what tools can help clinicians decide which OSA patients are at high risk for postoperative complications. It follows then that the accurate predictability of the complication risks and not just the prevalence of OSA in surgical patients is the more important interrogative. Identification is not enough because once a high risk of postoperative complications is clarified one must ask, what is the appropriate monitoring that should take place. Finally, the choice of monitoring sophistication needed for a postoperative patient becomes unimportant if this is not linked to an appropriate response, so what interventions will be helpful. The ASA guidelines[7] urge reassessment of anesthetic techniques for OSA patients and extubating patients once they are fully awake, but thereafter one could also ask what is the role for preemptive positive airway pressure therapy in high-risk OSA patients. Until we produce sufficient outcome data to guide us in the monitoring and postoperative management of OSA patients undergoing surgery, there is always the potential of the ***one more potentially tragic event***.

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DISCLOSURE STATEMENT

The author has indicated no financial conflicts of interest.