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PULMONARY DISEASE BOARD REVIEW MANUAL

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Perioperative Management of Sleep-Disordered Breathing and Obesity

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Table of Contents

Introduction	2
Preoperative Evaluation and Management	3
Intraoperative Issues	6
Postoperative Issues	7
Summary Points	8
Board Review Questions	9
Detailed Answers	9
References	9
Appendix	11

Cover Illustration by Christine Armstrong

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Perioperative Management of Sleep-Disordered Breathing and Obesity

Damien R. Stevens, MD, MS

I. INTRODUCTION

A strong association exists between obesity and sleep apnea-hypopnea syndrome (SAHS).¹ Because many patients with SAHS are obese and many of the relevant patient characteristics are similar in the 2 groups, the perioperative issues in sleep-disordered breathing and obesity will be discussed simultaneously in this article. This review focuses on SAHS because it is the most common form of sleeping disorder; however, other sleep disorders will be briefly described. A case patient is presented to highlight the perioperative management of patients with sleep-disordered breathing and/or obesity.

DEFINITIONS

Sleep-Disordered Breathing

Sleep-disordered breathing encompasses a broad range of disorders, including obstructive sleep apnea (OSA) (also called SAHS), central sleep apnea (CSA), and obesity-hypoventilation syndrome (OHS). In fact, some patients have an overlap of more than one disorder. *OSA* or *SAHS* is defined as repetitive episodes of upper airway obstruction that occur during sleep, which often are associated with a reduction in blood oxygen saturation. These episodes of airway obstruction are typically classified as *obstructive apneas* (ie, cessation of airflow for 10 seconds or more despite continued respiratory effort) or as *hypopneas* (ie, a shallow breathing pattern lasting for 10 seconds or more, leading to an arousal or oxygen desaturation).² These apneas and hypopneas are then combined and divided by the total number of sleep hours, yielding an apnea-hypopnea index (AHI). The AHI is the most commonly used marker of severity to describe SAHS. An AHI less than 5 is considered normal, whereas an AHI between 5 and 20 is considered indicative of mild SAHS.^{2,3} Moderate SAHS is typically defined as an AHI between 20 and 40, whereas severe SAHS is an AHI greater than 40.^{2,3} CSA is defined as a cessation of ventilatory effort during sleep lasting more than 10 seconds, which most commonly occurs in patients with cardiac or neurolog-

ic disease. *OHS* is defined as chronic hypercapnia, unrelated to intrinsic lung disease, in obese patients with or without SAHS. The exact pathophysiology of this disorder remains unknown.

When considering perioperative risks, SAHS is probably the most relevant and important sleep disorder because it is the most common form of sleep-disordered breathing and has been studied more than the other sleep disorders. However, no studies have compared the perioperative risks in patients with SAHS, CSA, and OHS. One study suggested increased hospital morbidity in patients with OHS, but this was a very limited study that did not concentrate on perioperative risks. It is also difficult to differentiate the risks of OHS from the risks of morbid obesity.

SAHS results from recurrent upper airway narrowing or even closure. Common symptoms include snoring, nocturnal choking, nocturia, and excessive daytime sleepiness. Obesity is the most common risk factor for SAHS, but abnormal craniofacial anatomy and a genetic predisposition also may contribute to risk. Coexistent lung disease and neuromuscular diseases also increase the risk for SAHS. Many published studies have described the disorder of sleep apnea and the associated morbidity. Few studies, however, have reported the operative risks of patients with sleep-disordered breathing. Thus, scant biomedical literature is available to support recommendations or guidelines for preoperative and perioperative evaluation/management.⁴

Obesity

Although the increased perioperative risks of obesity have been known for some time, the details of these complications remain poorly delineated.⁴ The incidence of obesity has increased rapidly in recent years.⁵ An estimated 97 million adults or 55.9% of adults older than age 20 years in the United States were overweight in a survey done from 1988 to 1994;⁶ the prevalence increased to 64.5% in a similar survey from 1999 to 2000.⁷ The prevalence of obese individuals increased from 22.9% to 30.5% during this same time period. The term *overweight* usually is defined as a body mass