Pediatric Obstructive Sleep Apnea

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KEYWORDS

• Obstructive sleep apnea • OSAS • Pediatric • Adenotonsillectomy

KEY POINTS

- Obstructive sleep apnea syndrome (OSAS) is a disorder of airway obstruction with multisystem implications and associated complications.
- OSAS affects children from infancy to adulthood and is responsible for behavioral, cognitive, and growth impairment as well as cardiovascular and perioperative respiratory morbidity and mortality.
- OSAS is associated commonly with comorbid conditions, including obesity and asthma.
- Adenotonsillectomy is the most commonly used treatment option for OSAS in childhood, but efforts are underway to identify medical treatment options.

INTRODUCTION

Obstructive sleep apnea (OSA) is a public health problem that affects approximately 1% to 6% of all children,[1,2] up to 59% of obese children,[3–5] 2% to 24% of adults, and 70% of bariatric surgery patients.[6] The incidence increases with age; the disorder is responsible for billions of dollars of direct and indirect health care costs[7] in the form of motor vehicle crashes; medical conditions, including cardiovascular disease, metabolic syndrome, diabetes, and cerebrovascular disease; as well as perioperative morbidity and mortality. The presence of OSA syndrome (OSAS) also has implications for job and school performance and has been associated with potentially life-long cognitive impairment as well as sudden death. Treatment programs for those identified with OSAS may improve functional outcomes, reduce health care costs, and contribute to longevity.[7,8]

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Anesthesiology Clin 32 (2014) 237–261
http://dx.doi.org/10.1016/j.anclin.2013.10.012 **anesthesiology.theclinics.com**
1932-2275/14/$ – see front matter

Once thought to be an isolated disorder of pharyngeal muscular mechanical dysfunction leading to partial or complete intermittent airway obstruction, we now know that OSAS is much more complicated and should be thought of as a syndrome with multisystem implications including the central nervous, cardiovascular, metabolic, and immune systems. Although some of its potential causative mechanisms are understood, the inciting cause is often unclear. Newer information about the implications of sleep hygiene and inflammation are especially relevant to the obesity phenotype in OSA but does not delineate which comes first, hence, the chicken versus the egg phenomenon. OSAS, also known as *sleep apnea hypopnea syndrome*, is characterized by symptoms such as snoring, frequent nighttime awakenings, daytime sleepiness, irritability, and depression in adults and behavioral disorders and poor school performance in children. Sobering is the evidence of long-term and possibly permanent cognitive impairment in patients of all ages, but particularly in younger pediatric patients and older adult patients; they may demonstrate deficits in executive function and lower IQ scores.[9] Because the sequelae of OSAS are thought to be a function of recurrent hypoxic injury and chronic sleep deprivation, prompt treatment of the disorder seems imperative. The recommended treatment modalities differ by age, cause, and comorbid conditions.

There are typically 4 main phenotypes that characterize OSAS, shown in **Fig. 1**. Although some patients may have contributions of more than one cause, it has become abundantly clear that the obesity phenotype now exceeds the other phenotypes fourfold.[10]

As anesthesiologists, we are challenged with recognizing the patients at risk of perioperative complications of OSAS. Perioperative morbidity and mortality in patients with OSAS have been well described,[11–14] although evidence of an association with the severity of disease and specific adverse events is lacking. The presence of a known diagnosis of OSAS carries implications for the anesthetic technique and disposition planning; however, the decision dialogue is hampered by inconsistencies in attitude regarding the need for formal testing and postoperative monitoring requirements. The minority of patients presenting for otolaryngologic and general surgical procedures have undergone polysomnography (PSG), the gold standard diagnostic test. Expensive, inconvenient, and not universally available, PSG is infrequently performed

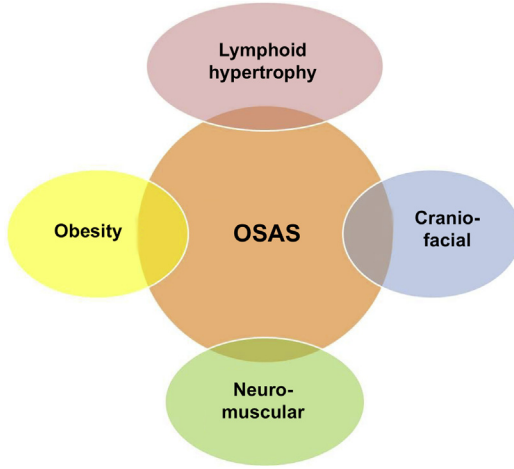

Fig. 1. The 4 phenotypes of OSAS.