Obstructive Sleep Apnea in the Hospitalized Patient

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KEYWORDS

• Obstructive sleep apnea • Positive airway pressure • Continuous pulse oximetry
• Berlin Questionnaire

HOSPITAL MEDICINE CLINICS CHECKLIST

1. Incorporate sleep apnea questioning into a routine review of systems, and positive airway pressure (PAP) machines into the medication reconciliation process.
2. Continue the patient's home PAP device while the patient is hospitalized using either the patient's own device or a hospital device set at the patient's home settings.
3. Consider continuous pulse oximetry in sleep apnea patients who are challenged medically or surgically:
   a. Patients undergoing major surgery, especially airway surgery
   b. Patients receiving general anesthesia or deep sedation
   c. Patients requiring high-dose narcotics
   d. Patients with a respiratory illness such as pneumonia, congestive heart failure, or chronic obstructive pulmonary disease exacerbation
   e. Patients with altered mental status, such as those with delirium or an insult to the brain
   f. Patients with altered neuromuscular function, such as poststroke patients or those with multiple sclerosis exacerbations
4. Organize a discharge management plan for those patients who are new to continuous PAP and do not carry a formal diagnosis.

DEFINITIONS

What is obstructive sleep apnea and how does it differ from central sleep apnea?

Obstructive sleep apnea (OSA) is the pathologic closure of the posterior pharynx during sleep. Officially it can only be diagnosed using an in-laboratory sleep study called polysomnography (PSG) or a home sleep study. An apneic episode is defined as a greater

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than 90% cessation of air flow for 10 seconds, whereas a hypopneic episode is defined as a 30% decrease in air flow lasting at least 10 seconds and associated with a 4% oxygen desaturation.[1] The PSG will document vigorous chest wall movement during an apneic episode in OSA, whereas in central sleep apnea a patient will show a complete absence of any inspiratory effort during an entire period of absent air flow, and is commonly associated with a pathologic neurologic disorder such as stroke.

The severity of OSA is measured using the apnea-hypopnea index (AHI), which reflects the number of apneas and hypopneas per hour during the sleep study (**Table 1**). One qualifies for the diagnosis of OSA if he or she has an AHI of 5 or more, with mild OSA defined as an AHI of 5 to 14, moderate OSA as 15 to 30, and severe OSA greater than 30 apneas/hypopneas per hour.

EPIDEMIOLOGY

What is the incidence of OSA in hospitalized patients?

The incidence of OSA in the general population has been estimated to be 2% in women and 4% in men.[2] However, the hospitalized patient population represents an older, less healthy population, which makes the incidence much higher. Studies have found the incidence to be as high as 24% to 33%[3,4] in the preoperative population and 60% to 96%[5,6] in the acute stroke population. Among 513 consecutive patients screened for OSA on one inpatient cardiology service, 44.1% screened as high risk.[7] Although most OSA patients remain undiagnosed, with increased awareness in the medical community and the general public more patients are arriving at hospitals with the diagnosis of OSA who are routinely using continuous positive airway pressure (CPAP) at home. Despite improved awareness and diagnosis, hospitals remain ill-equipped to manage what has classically been seen as an outpatient disease. A look at the 2004 National Hospital Discharge Survey found that only 5.8% of patients who carried the diagnosis of OSA were given CPAP while in hospital.[8] Much of this is a consequence of an educational gap among the hospital staff, and antiquated hospital policies that inappropriately view home CPAP resumption as acute respiratory failure requiring intensive care monitoring.

HISTORY AND EXAMINATION

What are common symptoms of OSA?

The loud snoring that is generated in OSA patients is produced by the floppy, partially obstructed posterior orophayrnx, and tends to reach higher decibels than that produced by the nasopharynx. A study during which the oropharynx of OSA patients was compared with normal patients, all of whom had general anesthesia and a paralytic administered, showed that the posterior oropharynx of OSA patients was significantly more narrow and/or collapsible.[9] Daytime drowsiness is another common

Table 1
Apnea-hypopnea index (AHI)

AHI	Degree of OSA
5–14	Mild
15–30	Moderate
>30	Severe

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