Management of Obstructive Sleep Apnea in Pregnancy

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KEYWORDS

• Obstructive sleep apnea • Obesity • Pregnancy • Diabetes • Preeclampsia
• Anesthesia • Sleep-disordered breathing • Hypoxia

KEY POINTS

- All women with known or suspected sleep apnea should undergo treatment with a goal to normalize oxygenation during sleep.
- Sleep apnea is associated with hypertensive disorders of pregnancy, gestational diabetes, severe maternal morbidities including cardiomyopathy and venous thromboembolism, and in-hospital death.
- Management of women with sleep apnea should be multidisciplinary and include specialists in sleep medicine and anesthesiology.
- After delivery, women with sleep apnea are at risk for severe respiratory suppression and medications that suppress respiration should be limited in use.

Obstetric patients have been underrecognized as a population at risk for sleep-disordered breathing (SDB). SDB is likely underappreciated in pregnancy because of several factors including limited provider education, a lack of reliable screening tools, and a need for additional studies characterizing the dynamic effects of pregnancy on SDB and perinatal outcomes.[1] In addition, several of the most common risk factors for SDB recognized by clinicians were established from studies that excluded women of reproductive age.[2] It is now recognized that SDB may present differently in women of reproductive age, which can further complicate screening and diagnosis.[3]

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Studies of SDB in recent years indicate there are significant implications for pregnancy. Women affected by SDB are more likely to experience pregnancy complications and adverse pregnancy outcomes.[4–10] This article reviews SDB, the implications for pregnancy, and ways that a practicing physician can improve clinical outcomes.

WHAT IS SLEEP-DISORDERED BREATHING?

SDB is a group of disorders characterized by ventilation abnormalities during sleep. The spectrum of SDB ranges from mild snoring to obstructive sleep apnea (OSA), the most severe form of SDB.[11] OSA involves multiple episodes of apnea or hypopnea during sleep that result from diminished airflow through the upper airway during respiratory effort, caused by partial or complete upper airway tissue collapse. This phenomenon leads to sleep fragmentation, sympathetic stimulation, hypercarbia, and intermittent cycles of hypoxemia and reoxygenation.[12] These pathophysiologic perturbations in turn contribute to inflammation, endothelial dysfunction, insulin resistance, and cardiovascular disease.[12] Repeated nocturnal arousals can result in excessive daytime sleepiness, and increased risk when driving or operating machinery.[12–14] The terms SDB and sleep apnea have been used interchangeably in the obstetric literature.

GESTATIONAL OBSTRUCTIVE SLEEP APNEA

Women diagnosed with OSA during pregnancy likely represent one of two distinct clinical phenotypes: women with pre-existing OSA that become pregnant (chronic OSA), and pregnant women who develop OSA (gestational OSA). Women with gestational OSA may enter pregnancy with snoring, and develop worsening airway obstruction because of physiologic and hormonal changes of pregnancy or in association with other comorbidities developed in pregnancy (multiple gestations, hypertensive disorders of pregnancy, or gestational diabetes). Some physiologic changes of pregnancy that may predispose women to OSA include upper airway edema and respiratory-driven changes leading to larger negative upper airway pressures caused by elevated estrogen and progesterone.[15] There is some evidence that gestational OSA may improve or resolve entirely after pregnancy.[16–18] However, the term “gestational sleep apnea” has not been formally defined. To date, the progression and impact of these two phenotypes has not been well described in either the perinatal period or beyond.

EPIDEMIOLOGY AND RISK FACTORS

The risk factors for OSA are well established in the general population and include male gender, older age, obesity, African-American race, craniofacial abnormalities, and smoking.[19,20] OSA is also associated with other comorbid conditions including type II diabetes, hypertension, cardiac arrhythmias, and cardiovascular disease.[12] Women who have those risk factors before pregnancy may be at increased risk for OSA. The existing studies in pregnancy also recognize increasing gestation, increasing maternal age, obesity, chronic hypertension, and frequent snoring ($\geq$3 times per week) as risk factors.[8,10,21] In the largest prospective study to date, women with OSA were older, had higher body mass index, larger neck circumference, and were more likely to have chronic hypertension, which is consistent with prior studies.[6]

Longitudinal studies of OSA indicate an increased prevalence across gestation.[6,22] In the largest prospective study currently published, the prevalence of OSA was