The National Healthy Sleep Awareness Project involves a partnership between the American Academy of Sleep Medicine, Center for Disease Control and Sleep Research Society. The long term goal of the project is to promote improved sleep health in the United States. The project will increase public awareness of the importance of healthy sleep. It also will promote the treatment and prevention of sleep disorders.

Indicators of and Screening for Obstructive Sleep Apnea

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CASE

A 49 year old man with a history of GERD and depression presents for his annual physical. He denies any significant complaints except that he is exhausted which he attributes to increased demands at work. He reports difficulty staying awake at meetings and when working on his computer. He notes a 10-pound weight gain over the past 6 months. On further questioning, he endorses loud snoring and nocturnal gasping for air. Upon awakening, he sometimes finds that his wife has left the bedroom. His medications include omeprazole and escitalopram. His current blood pressure is 148/102, and his body mass index is 31.71 kg/m^2. A fasting comprehensive metabolic panel is normal except for a glucose of 104 (normal = 70-99). He is started on hydrochlorothiazide and referred to a sleep specialist.

DISCUSSION

Obstructive sleep apnea (OSA) is a common condition in the United States and worldwide. Prevalence estimates range from 2-7% in the general population[1] but is particularly high in certain cohorts. A prevalence of OSA of over 70% has been reported obese Type II diabetics[2] and in patients undergoing bariatric surgery[3,4] and with drug-resistant HTN.[5] The prevalence of OSA is also high in patients following acute stroke[6] and acute coronary syndrome,[7] as well as in the elderly.[8-10] However, the majority of cases of OSA in the U.S. remain undiagnosed.[11,12]

OSA is not a benign condition. It is a systemic disorder since the repetitive falls in oxygen affect all organ systems. Untreated OSA can result in serious morbidity and mortality. OSA is associated with hypertension,[13] impaired glucose control,[14] congestive heart failure,[15] coronary heart disease,[15] mild cognitive

impairment or dementia,[16] depression,[17] atrial fibrillation,[18] and stroke.[19] OSA, particularly severe OSA, is associated with increased mortality.[20]

In addition to the health risks, OSA may cause problems with everyday life. Loud snoring may cause the bed partner to sleep in a separate room. Significant sleepiness may interfere with the ability to participate in social activities and perform well at work. Sleepiness is particularly concerning when operating motor vehicles. In fact, OSA has been shown to cause significant impairments in the ability to carry out a simulated driving task[21,22] and increases the risk of a motor vehicle crash among drivers by two-fold.[23]

There are a number of risk factors for OSA including obesity, increasing neck size (greater than 17 inches), male gender, craniofacial features (e.g. retrognathia and macroglossia) and increasing age.[24] It is important for providers to ask about common presenting symptoms such as snoring, witnessed apneas, nocturnal gasping, morning dry mouth, feeling unrefreshed on awakening from sleep, and excessive daytime sleepiness (e.g. as measured by the Epworth Sleepiness Scale[25]). Particular attention should be paid to patients with a history of stroke, refractory hypertension, coronary artery disease as well as to obese type II diabetics and to individuals with depression or new onset atrial fibrillation.

CASE FOLLOW-UP

The patient is obese, has loud snoring and is sleepy to the point that it is interfering with his work. He likely has OSA. This corresponds with his weight gain and sleep problems in the past 6 months, and may contribute to his borderline hyperglycemia and HTN. He requires a sleep study and would likely benefit from treatment.

DIAGNOSIS OF OBSTRUCTIVE SLEEP APNEA

While a clinical scenario may be strongly suggestive of OSA, the diagnosis of OSA is made by polysomnography. Polysomnography is typically performed in a sleep laboratory and includes electroenceophalographic (EEG), electromyographic, respiratory and electrocardiographic measurements. Portable studies can be done at home as well using devices that provide respiratory and ECG monitoring but not EEG recording. An event is considered obstructive if there is continued respiratory effort observed in the thoracic or abdominal sensors with absent airflow. Apneas are scored as >90% reduction in breathing, and hypopneas are scored as a >30% reduction in breathing associated with an oxyhemoglobin

desaturation of 3%.[26] In-laboratory polysomnography can also utilize EEG arousals following a >30% reduction in airflow to score hypopneas. Both apneas and hypopneas last for at least 10 seconds in duration. The number of respiratory events per hour is called the apnea-hypopnea index (AHI). An AHI<5 is considered normal, 5 to <15 is considered mild, 15 to <30 is considered moderate, ≥30 is considered severe. In general, the adverse health consequences of OSA are higher with increasing AHI.

Home sleep studies are appropriate for patients with a high pretest probability of OSA. In-laboratory polysomnography should be used for individuals with moderate pretest probability of OSA and may also be indicated in patients for whom there is a concern of another sleep disorder (such as central sleep apnea or a parasomnia) or nocturnal hypoventilation. As the sensitivity of unattended studies is lower than in-laboratory studies for OSA, in-laboratory studies can be considered in patients for whom an unattended study is negative, but a high clinical suspicion for OSA remains. Treatment of OSA will be discussed in a separate article.

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