

Sleep Apnea: An Overview

Niketh DeSouza

Private Practitioner, Mazgaon, Mumbai, Maharashtra, India

Abstract

Sleep apnea is a common and potentially dangerous sleep disorder characterized by one or more pauses in breathing or instances of shallow breathing during sleep. The episodes of apnea can last from a few seconds to several minutes. It is estimated that 1 in every 15 Americans has sleep apnea. Sleep apnea is associated with an increased risk of developing cardiovascular disease, stroke, hypertension, arrhythmias, diabetes, and causing accidents due to falling asleep while driving. A 2012 study showed that the hypoxia caused by sleep apnea promoted angiogenesis which increased tumor and vascular growth. This led to a 4.8 time increase in the incidence of cancer mortality. Sleep apnea can often go undiagnosed as patients are unaware of it while they sleep. It is estimated that the average untreated sleep apnea patient's annual health-care costs 1336 dollars more than a person without sleep apnea which can cause 3.4 billion dollars a year in additional medical costs. It is a chronic condition which requires management throughout life. Lifestyle modifications, oral appliances, surgery, and breathing devices can treat sleep apnea in most patients. The introduction of the continuous positive airway pressure has greatly improved the management of sleep apnea.

Key words: Central sleep apnea, Complex sleep apnea, Mixed sleep apnea, Obstructive sleep apnea, Sleep apnea

INTRODUCTION

The three main types of sleep apnea are obstructive (84%), central (0.4%), and mixed or complex sleep apnea (15%) which is a combination of both types. Obstructive sleep apnea (OSA) is due to a physical blockage of airflow while central sleep apnea is due to a lack of respiratory effort. Both will present with excessive daytime sleepiness, lethargy, inability to focus and decreased alertness. In addition to these, OSA will have snoring. Below we will discuss each of the types of sleep apnea including how to diagnose and treat them.¹⁻³

OSA

OSA is the most common type of sleep apnea and occurs when the muscles of the throat relax and block airflow during sleep. It can be a partial or complete obstruction of the upper airway. 2-4% of Americans are said to have OSA

and it is most commonly diagnosed in middle-aged men.⁴ OSA can be temporary in those who have upper respiratory tract infections, nasal congestion, tonsillitis, or are under the influence of alcohol. Risk factors for developing OSA include increased body mass index (BMI), large neck size, hypertension, diabetes, chronic nasal congestion, male gender, ages 18-60, smoking and using alcohol. Most of the cases of OSA are thought to be due to decrease in muscle tone, old age, and brain injury. OSA in children is usually caused by overgrown tonsils and adenoids. Muscle tone decreases with alcohol and certain drugs. Women are at the highest risk of developing OSA during pregnancy and prevalence is higher in post-menopausal women than menstruating women. Syndromes with craniofacial abnormalities (such as Down's syndrome) can increase the risk of developing OSA. OSA usually occurs in rapid eye movement (REM) sleep when the muscle tone in the neck, throat and skeletal muscles are decreased. This allows the oropharynx and tongue to relax and partially or completely block the flow of air. In some cases when the blood oxygen level decreases, a neurological stimulation can cause interruption of sleep which may cause awakening and will have a negative effect on the quality of sleep. This can occur in non-REM (NREM) Stage 3 as well which is the deepest stage of sleep and has a physically restorative effect on the body. In children, this stage of sleep (NREM Stage 3) is also responsible for the release of growth

Access this article online



www.ijss-sn.com

Month of Submission : 05-2016
Month of Peer Review : 06-2016
Month of Acceptance : 07-2016
Month of Publishing : 07-2016

Corresponding Author: NikethDeSouza, Court View, 33 Nesbit Road, Mazgaon, Mumbai - 400 010, Maharashtra, India.
Phone: +91-920359448. E-mail: nikethdesouza@gmail.com

hormone and OSA can result in failure to thrive in the affected children. Clinical symptoms can be divided into nocturnal and daytime symptoms. The nocturnal symptoms include loud snoring, witnessed apneas, insomnia, nocturia, sudden arousal from sleep accompanied by gasping and choking. The daytime symptoms include non-restorative sleep, morning headaches, dry mouth on awakening, daytime fatigue that worsens throughout the day, daytime sleepiness with the need to take frequent naps, decreased the ability to concentrate, mood and personality changes and decreased libido. The patient will usually present as an obese adult with a thick neck who is either brought in by the patient's partner, who are alerted by the episodes of apnea and snoring, or by the patient themselves who complain of excessive daytime sleepiness. The daytime sleepiness usually begins with quiet activities such as watching TV or reading but can later progress to even activities which require alertness such as driving. A clinical diagnosis can be made by asking about the symptoms previously mentioned or by providing the patient with a questionnaire to fill which can then be scored to determine their likelihood of having OSA. Physical examination includes calculating the BMI (>30 is a risk factor) and measuring the neck circumference (>43 cm in men and >37 cm in women is a risk factor). Other findings on the physical exam can include an abnormal Mallampati score, enlarged tonsils, high-arched hard palate, large degree of overjet, and hypertension. The gold standard, however, to diagnose sleep apnea (obstructive or central) is with an overnight sleep study or polysomnography. This can either be done at home (less reliable) or at a sleep center. According to the results of the sleep study, sleep apnea can be graded. The number of events of apnea per hour is reported as the apnea-hypopnea index or AHI. An AHI of <5 is normal, 5-15 is mild, 15-30 is moderate, and >30 is severe. The treatment of sleep apnea includes lifestyle modifications such as weight loss, avoidance of sedatives, alcohol or tobacco, and sleeping on one's side. Mild to moderate OSA can be treated with oral appliances which help keep the throat open by bringing the lower jaw forward. The most common method of treating moderate to severe OSA is by continuous positive airway pressure (CPAP) or a CPAP machine. The machine is connected to a mask which is fitted over the nose and mouth or just into the nose and delivers an airway pressure which prevents the upper airway from collapsing during sleep. This decreases the episodes of apnea and improves the symptoms of OSA. The CPAP can be either a continuous (fixed) pressure or an auto-titrating pressure. Newer CPAP machines are much smaller and less noisy than the older ones. Certain surgeries can be done to treat sleep apnea such as turbinectomy, tonsillectomy, adenoidectomy, and maxillomandibular advancement.

CENTRAL SLEEP APNEA

Central sleep apnea occurs when the effort to breathe is absent or diminished. It is much less common than OSA and is prevalent in $<1\%$ of the general population. It is due to the respiratory centers in the brain not sending the correct signals to the muscles that control respiration. This will cause the individual to miss one or more breathing cycles. This increases the level of blood carbon dioxide which usually stimulates respiration through neurologic feedback which will cause a period of hyperpnea. Thus the individual may cycle through a period of apnea and hyperpnea throughout the night. There will be no chest movement or efforts to breathe seen during the periods of apnea. There can be awakenings during the periods of apnea which will be followed by a period of panic caused by the increase in blood CO_2 levels and sometimes the inability to breathe normally for a short duration following the sudden awakening. Some of the conditions that can lead to central sleep apnea are Parkinson's disease, brain infections, stroke, anything that harms the brainstem, cervical injuries, heart failure, and drugs such as narcotics. Symptoms are similar to that of OSA without the snoring. There will be a lack of thoracic or abdominal movement in individuals with central sleep apnea while they are asleep. Diagnosis is aided by clinical history, physical examination and confirmed with polysomnography at a sleep center. This will help differentiate between obstructive and central sleep apnea or whether the apnea is caused by a mixture of both (complex sleep apnea). The degree of sleep apnea is graded as before (mild, moderate, severe). The treatment is first based on addressing the medical conditions which could be causing the sleep apnea such as Parkinson's or opioid medications. Devices used include CPAP, bi-level positive airway pressure, and adaptive servo-ventilation. Certain drugs such as acetazolamide have been used to stimulate the respiratory centers. They do so by causing metabolic acidosis which then induces respiratory alkalosis (increased the respiratory rate) as a compensatory measure.

CONCLUSION

Sleep apnea is a serious sleep disorder affecting over 40 million Americans. There is an enormous amount of data showing that untreated sleep apnea is associated with cardiovascular disease, stroke, and other medical conditions. Physicians should be vigilant for the common signs and symptoms of sleep apnea and by asking a few additional questions, be able to identify those who may require further diagnostic workup. Due to the high prevalence of the disorder and its burden on the individual, society, and health-care system, untreated sleep apnea cannot be ignored.

REFERENCES

1. Javier NF, Peppard PE, Young T, Finn L, Hla KM, Farré R. Sleep-disordered breathing and cancer mortality: Results from the Wisconsin sleep cohort study. *Am J Respir Crit Care Med* 2012;186:190-4.
2. Kapur V, Blough DK, Sandblom RE, Hert R, de Maine JB, Sullivan SD, *et al.* The medical cost of undiagnosed sleep apnea. *Sleep* 1999;22:749-55.
3. Morgenthaler TI, Kagramanov V, Hanak V, Decker PA. Complex sleep apnea syndrome: Is it a unique clinical syndrome? *Sleep* 2006;29:1203-9.
4. Azagra-Calero E, Espinar-Escalona E, Barrera-Mora JM, Llamas-Carreras JM, Solano-Reina E. Obstructive sleep apnea syndrome (OSAS). Review of the literature. *Med Oral Patol Oral Cir Bucal* 2012;17:e925-9.

How to cite this article: DeSouza N. Sleep Apnea: An Overview. *Int J Sci Stud* 2016;4(4):253-255.

Source of Support: Nil, **Conflict of Interest:** None declared.