

Sleep Apnea : A Review

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Abstract

Snoring problems can affect the sleep quality and health of an individual and can get in the way of the bed partner's rest, ruining relations. They also prevent the individual from being energetic, mentally sharp, and productive. But not all snoring are normal, sometimes it may be something more serious, like chronic sleep deprivation resulting in daytime sleepiness, slow reflexes, poor concentration, and an increased risk of accidents. All these symptoms are suggestive of a syndrome called as sleep apnea or "Pickwickian syndrome"

Introduction

Snoring is the turbulent sound of air moving through the back of the mouth, nose, and throat. Although not everyone who snores is experiencing difficulty breathing, snoring in combination with other conditions such as overweight and obesity has been found to be highly predictive of sleep apnea risk^{1,6}

Sleep apnea affects the way a person breathes when sleeping. In untreated sleep apnea, breathing is briefly interrupted or becomes very shallow during sleep. These breathing pauses typically last between 10 to 20 seconds and can occur up to hundreds of times a night, jolting an individual of his natural sleep rhythm. The consequence, of which are more time is spend in light sleep and less time in the deep, restorative sleep. Sleep apnea can also lead to serious health problems over time, including diabetes, high blood pressure, heart disease, stroke, and weight gain.

Types of Sleep Apnea²

- Obstructive sleep apnea is the most common type of sleep apnea. It occurs when the soft tissue in the back of the throat relaxes during sleep and blocks/obstructs the airway, often causing to snore loudly.
- Central sleep apnea is a much less common type of sleep apnea that involves the central nervous system, occurring when the brain fails to signal the muscles that control breathing. People with central sleep apnea seldom snore.
- Complex sleep apnea is a combination of obstructive sleep apnea and central sleep apnea.
- The most common type of sleep apnea is Obstructive sleep apnea (OSO).

The signs and symptoms associated with OSO include snoring, excessive daytime sleep, choking during night, fragmented sleep, irritability, personality changes, decrease sex drive, impotency and morning headaches. Individuals with low muscle tone

and soft tissue around the airway (e.g. because of obesity) and structural features that give rise to a narrowed airway are at high risk for obstructive sleep apnea.^{7,8} The elderly are more likely to have OSA than young people. Men are more likely to suffer sleep apnea than women and children are, though it is not uncommon in the last two population groups^[8] Snoring is a common finding in people with this syndrome. The loudness of the snoring is not indicative of the severity of obstruction, however. If the upper airways are tremendously obstructed, there may not be enough air movement to make much sound. Even the loudest snoring does not mean that an individual has sleep apnea syndrome. The sign that is most suggestive of sleep apneas occurs when snoring stops.

The term "sleep-disordered breathing" is commonly used to describe the full range of breathing problems during sleep in which not enough air reaches the lungs (hypopnea and apnea). Sleep-disordered breathing is associated with an increased risk of cardiovascular disease, stroke, high blood pressure, arrhythmias, diabetes, and sleep deprived driving accidents.³ When high blood pressure is caused by OSA, it is distinctive in that, unlike most cases of high blood pressure (so-called essential hypertension), the readings do not drop significantly when the individual is sleeping.⁴ Stroke is associated with obstructive sleep apnea. The risk of OSA rises with increasing body weight, active smoking and age. In addition, patients with diabetes or "borderline" diabetes have up to three times the risk of having OSA.

Clinical Evaluation

During the clinical examination the dentist should be aware of three basic areas of obstruction in OSO; which are the nasopharyngeal, oropharyngeal and hypopharyngeal areas. In the nasopharyngeal area the obstruction is usually caused by turbinate hypertrophy, deviated septum or an abnormal growth like a polyp. It is important to look up the patient's nose to check for blockages, particularly in children.

In the oropharyngeal area, clinical examination would reveal hypertrophy of tonsils and a large tongue. Clinical examination must also include the size and shape of the uvula and the soft palate.

The obstruction of the hypo pharyngeal region is difficult to detect clinically. The obstruction is normally caused by the tongue when it drops back against the pharyngeal wall and completely blocks the airway. The incidence increases in patients whose mandibles are retrognathic and have a typical class II skeletal pattern.

Diagnosis of sleep apnea can be

confirmed using a polysomnogram. It in a sleep clinic or home oximetry.^{4,7} It is used to evaluate the individual sleep architecture including stages and cycles of sleep as well as record the electrical activity of the brain, the eyes, muscles and the heart

1. Electroencephalogram (EEG)
2. Electro-oculogram (EOG)
3. Electro-myogram (EMG)
4. Electrocardiogram (ECG).

Mixed Apnea & Complex Sleep Apnea

Some people with sleep apnea have a combination of both types. When obstructive sleep apnea syndrome is severe and longstanding, episodes of central apnea sometimes develop. The exact mechanism of the loss of central respiratory drive during sleep in OSA is unknown but is most commonly related to acidbase and CO₂ feedback malfunctions stemming from heart failure. There is a constellation of diseases and symptoms relating to body mass, cardiovascular, respiratory, and occasionally, neurological dysfunction that have a synergistic effect in sleep-disordered breathing. In some cases, a side effect from the lack of sleep is a mild case of Excessive Daytime Sleepiness (EDS) where the subject has had minimal sleep and this extreme fatigue over time takes its toll on the subject. The presence of central sleep apnea without an obstructive component is a common result of chronic opiate use (or abuse) owing to the characteristic respiratory depression caused by large doses of narcotics.

Signs and Symptoms

It can be tough for an individual to identify sleep apnea, since the most prominent symptoms only occur when asleep. But this difficulty can be overcome by asking a bed partner to observe sleep habits, or by recording sleep.^{1,8,9,10}

Major Signs & Symptoms of Sleep Apnea

- Loud and chronic snoring.
- Choking, snorting or gasping during sleep.
- Long pauses in breathing.
- Daytime sleepiness, no matter how much time you spend in bed.
- Other common signs and symptoms of sleep apnea-
- Waking up with a dry mouth or sore throat.
- Morning headaches.
- Restless or fitful sleep.
- Insomnia or nighttime awakenings.
- Going to the bathroom frequently during the night.
- Waking up feeling out of breath.
- Forgetfulness & difficulty concentrating.
- Moodiness, irritability, or depression.
- Signs and symptoms of sleep apnea in

children-

While obstructive sleep apnea can be common in children, it's not always easy to recognize. In addition to continuous loud snoring, children with sleep apnea may adopt strange sleeping positions and suffer from bedwetting, excessive perspiration at night, or night terrors. Children with sleep apnea may also exhibit changes in their daytime behavior, such as-

- Hyperactivity or inattention.
- Developmental and growth problems.
- Decrease in school performance.
- Irritable, angry, or hostile behavior.
- Breathing through mouth instead of nose.

If a child is suspected to have sleep apnea, a pediatrician should be consulted who specializes in sleep disorders. Once obstructive sleep apnea is diagnosed, surgery to remove the child's tonsils or adenoids usually corrects the problem. Diagnosis in adults can be made with the help of following.

- Any hours spent in bed, any nighttime awakenings, and whether the individual feel refreshed in the morning. The sleep partner should be asked to keep track of the snoring, including how loud and frequent it is. Also ask him or her to note any gasping, choking, or other unusual sounds.
- Recording the sleep Taking a video or audio recording while asleep can be very informative and revealing. You can use a sound-activated audio recorder, a video camera, or software that turns your computer into a recorder.

Causes and Risk Factors-

Anyone can have sleep apnea young, old, male, female, and even children. However, certain risk factors have been associated with obstructive and central sleep apnea.

Risk Factors for Obstructive Sleep Apnea

Individuals are at a higher risk for obstructive sleep apnea if they are-

- Overweight
- Male
- Related to someone who has sleep apnea
- Over the age of 65
- A smoker

Other risk factors for obstructive sleep apnea include certain physical attributes, such as having a thick neck, deviated septum, receding chin or enlarged tonsils or adenoids^{8,9} (the most common cause of sleep apnea in children). The airway may be blocked or narrowed during sleep simply because the throat muscles tend to relax more than normal. Allergies or other medical conditions that cause nasal congestion and

blockage can also contribute to sleep apnea.

Risk Factors for Central Sleep Apnea

Like obstructive sleep apnea, central sleep apnea is more common in males and people over the age of 65. However, unlike obstructive sleep apnea, central sleep apnea is often associated with serious illness, such as heart disease, stroke, neurological disease, or spinal or brainstem injury.

Treatment Options for Sleep Apnea

While a diagnosis of sleep apnea can be scary, it is a treatable condition. In fact, there are many things you can do on your own to help, particularly for mild to moderate sleep apnea¹⁸⁽¹⁹⁾⁽²⁰⁾. Home remedies and lifestyle modifications can go a long way in reducing sleep apnea symptoms.

Lifestyle Changes that can Help Sleep Apnea

- **Lose weight** Even a small amount of weight loss can open up the throat and improve sleep apnea symptoms.
- **Quit smoking.** Smoking is believed to contribute to sleep apnea by increasing inflammation and fluid retention in the throat and upper airway.
- Avoid alcohol, sleeping pills, and sedatives, especially before bedtime as they relax the muscles in the throat and interfere with breathing.
- Avoid caffeine and heavy meals within two hours of going to bed.
- Maintain regular sleep hours. Sticking to a steady sleep schedule will help you relax and sleep better. Apnea episodes decrease when you get plenty of sleep.
- Sleep on your side. Avoid sleeping on the back, as gravity makes it more likely for the tongue and soft tissues to drop and obstruct the airway.
- Prop the head up. Elevate the head of the bed by four to six inches or elevate the body from the waist up by using a foam wedge.
- Keep the nasal passages open. Try to keep nasal passages open at night using nasal dilators, saline spray, breathing strips, or a neti pot.

Exercises to Reduce Sleep Apnea¹⁸

Studies show that throat exercises may reduce the severity of sleep apnea by strengthening the muscles in the airway, making them less likely to collapse. eg blowing a balloon for 5 times.

Medications²¹

Medications like acetazolamide lower blood pH and encourage respiration. Low doses of oxygen are also used as a treatment for hypoxia but are discouraged due to side

effects.

CPAP for Sleep Apnea

Continuous Positive Airflow Pressure (CPAP) is the most common treatment for moderate to severe obstructive sleep apnea.^{22,23,24} In many cases, immediate symptom relief and a huge boost in mental and physical energy is accomplished. The CPAP device is a mask-like machine that provides a constant stream of air that keeps breathing passages open while an individual sleeps. Most CPAP devices are the size of a tissue box.

CPAP Without the Mask

One of the newest treatment options for sleep apnea is an alternative form of CPAP called Provent, a device that fits over the nostrils and is smaller and less intrusive than the traditional CPAP machine. In addition to CPAP, there are other adjustable airway pressure devices that a sleep specialist may recommend: Bilevel positive airway pressure (BPAP), Adaptive servo-ventilation (ASV).

Dental Devices for Sleep Apnea

Most dental devices are acrylic and fit inside your mouth, much like an athletic mouth guard. Others fit around your head and chin to adjust the position of your lower jaw. Two common oral devices are the mandibular repositioning device and the tongue retaining device.^{25,26,27} These devices open the airway by bringing the lower jaw or tongue forward during sleep.

Dental devices are only effective for mild to moderate sleep apnea. There are also a number of troubling side effects from using this type of treatment, including soreness, saliva build-up, nausea, and damage or permanent change in position of the jaw, teeth and mouth. It is very important to get treated by a dentist specializing in sleep apnea and to see the dentist on a regular basis for any dental problems that may occur. The patient may also need to periodically have the dentist adjust the mouthpiece to fit better.

Surgery as Treatment for Sleep Apnea

Surgery can increase the size of the airway, thus reducing the episodes of sleep apnea. Surgery can also involve removing the tonsils, adenoids, or excess tissue at the back of the throat or inside the nose.²⁹ Or the surgeon may reconstruct the jaw to enlarge the upper airway. Surgery carries risks of complications and infections, and in some rare cases, symptoms can become worse after surgery.

References

References are available on request at editor@healtalklht.com