

OBESITY & SLEEP APNOEA

What is Sleep Apnoea?

Obstructive sleep apnoea (OSA) is a condition characterized by intermittent episodes of absence of breathing (apnoea) due to obstruction of the upper airway during sleep.

Sleep predisposes one to narrowing - and in susceptible persons, to collapse - of the upper airway by reducing the tone of the upper airway muscles. The areas of the upper airway that are predisposed to obstruction during sleep is usually behind the soft palate and behind the tongue.

Complete airway collapse during sleep is usually preceded by years of narrowing that produces snoring. Thus by the time adults with OSA come to medical attention, they have a long history of loud snoring, often beginning in childhood. When outright obstruction of the airway develops, however, the snoring is interrupted by periods of silence lasting 15 to 90 seconds, coincident with the complete cessation of airflow.

During these episodes of apnoea, severe reduction of oxygen level in the body often develops until the apnoea is terminated by a brief awakening or arousal, and airway patency is restored. These events are usually accompanied by a generalised startle response, snorting and gasping.

After a few deep breaths, the patient returns to sleep, only to have the cycle of events repeated as many as 200-400 times during 6 to 8 hours of sleep.

OSA is a common medical problem that affects about 4% of the population. OSA should be suspected in people who are obese, habitual snorers, sleepy in the day or have hypertension.

Obesity and Sleep Apnoea

Perhaps the most important determinant of whether one is at risk of OSA is whether one is overweight or not. OSA is present in about 40% of obese individuals and about 70% of OSA patients are obese. A recent study showed that a 10% weight gain is associated with a 6-fold increase in the odds of developing OSA and a 10% loss in weight led to a 26% decrease in the severity of OSA.

Even children are not spared. OSA was found to be moderately prevalent among obese children - namely, 13% to 36%. The severity of OSA was positively related to the degree of obesity. Blood pressure is found to be elevated in obese children with OSA and weight reduction is an effective treatment.

Typically, a person with OSA has "male-pattern" obesity with predominance of fat deposition in the central and upper parts of the body, especially the neck region. A prediction rule based on neck circumference can be used to estimate a person's probability of having OSA (Table 1) - the thicker the neck, the higher the chance.

The "adjusted neck circumference" in cm is calculated by adding 4 cm if the person has hypertension, 3 cm if the person is a habitual snorer, and 3 cm if the person is reported to choke or gasp most nights.

Table 1 illustrates how the adjusted neck circumference corresponds with a person's clinical probability of having a positive test result for OSA.

Consequences of Sleep Apnoea

There are 2 major consequences of OSA that should be of concern to the sufferer and these are: excessive sleepiness in the day and the link between OSA and several forms of cardiovascular disease. The first is bad enough. Excessive Daytime Sleepiness is associated with adverse effects on job performance, family relationships and quality of life and is also an important cause of motor vehicle accidents.

Sleep deprivation in patients with OSA is associated with a worrying seven-fold increase in driving accidents. The second consequence of OSA is also alarming. Increasingly, OSA is identified as an independent and significant risk factor for several forms of cardiovascular disease such as hypertension, heart failure, heart, heart attacks, heart rhythm disturbances (especially during sleep) and even strokes.

OSA and the Heart

In OSA, the recurring episodes of apnoea lead to disruption of normal restful sleep and a lack of oxygen during sleep. These result in the body's production of higher levels of stress hormones throughout the night that are deleterious to one's cardiovascular system. To the body, this is akin to experiencing many near-suffocation episodes every night, except that the OSA sufferer is usually not aware of these recurring episodes during sleep. Not surprisingly, OSA patients have higher blood pressure during sleep – an average of 9 mmHg increase in blood pressure compared to healthy individuals without OSA, in whom blood pressure should be lower during sleep.

People with mild to moderate OSA are also twice as likely to become hypertensive and people with moderate to severe sleep apnoea are almost three times as likely to become hypertensive. In people already with a "weak heart" (heart failure), undiagnosed and untreated OSA may also worsen their heart function. The good news, nonetheless, is that effective treatment for OSA is available. As mentioned above, weight reduction can significantly reduce the severity of OSA.

Other established forms of treatment include continuous positive airway pressure (CPAP) and specific forms of surgery. However, in all cases, the condition has to be recognised first and the diagnosis confirmed. The standard way to confirm if one has OSA is to undergo a sleep study.

Sleep - the new vital sign?

In view of the strong association between OSA and the development and worsening of cardiovascular illness, we should be on the look out for symptoms of OSA such as loud habitual snoring, excessive daytime sleepiness/fatigue and restless or unrefreshing sleep with frequent awakenings, especially in

people who are overweight with hypertension without any known secondary causes. How we sleep at night may really affect our heart health.

Table 1 - Adjusted neck circumference and corresponding clinical probability of OSA

Adjusted neck circumference* (cm)

Clinical probability

< 43 Low

43 - 48 Intermediate

> 48 High

*Calculated by adding 4 cm to actual measured neck circumference if: the person has hypertension, 3 cm if the person is a habitual snorer, and 3 cm if the person is reported to choke or gasp most nights