

Sleep

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(Dr. D. Balakrishnan is a Paediatric ENT surgeon and is interested in snoring studies. He has an ability to wrap up difficult subjects in simple language. Recently, he delivered a lecture on sleep and snoring to the Rotarians of Adyar. Enthused by the response of the audience to his lecture, he has written this article in a simple style, easy enough to be understood by non-medical men. In this article, he gives an overview of sleep and its disturbances. - Editor)

What is sleep?

Every one of you will agree that sleep means rest. The body lies still. During sleep, the person does not respond to call. To do anything worthwhile, he will have to be woken up. So, the person is inactive; But, is he really so? The short answer is a big NO. The body may be still; but the brain is active. In fact, EEG studies show that the brain is more active during sleep than when awake. During sleep, the memory stores are reorganised properly. The immune system is rejuvenated; In short, sleep is a process of relaxation and more importantly, restoration of the body systems.

If you do not sleep well, you will not be fresh the next day. You feel sleepy. Insufficient sleep can be dangerous. Drivers may sleep at the wheels, causing accidents. Students may lag in studies. Sleep deprived persons may show personality changes - lack of attention, poor concentration, restlessness, anger and even violence are all common in them. Moreover, frank physical illnesses like high blood pressure, heart attacks and diabetes are found more often in insomniac persons. Now, let us get to know a little more about sleep.

Phases of sleep:

Sleep is not a unitary phenomenon. There are basically two types of sleep - light sleep and deep sleep. Sleep scientists use a specific terminology. Such terminology is a little confusing for many persons. Let me unravel the terminology. At the onset of sleep, we sleep lightly. Little while later, we sink into deep sleep. During this phase, the muscles become flaccid; however, the eyes move rapidly. Hence this phase is called REM (Rapid Eye Movement) sleep. It is during this phase that dreams occur. The initial lighter sleep is termed Non REM

(NREM) sleep. One lighter sleep period and a deeper sleep period, occurring one after the other are together called one sleep cycle. This cycle repeats rhythmically, approximately once every 90 minutes. This alternating pattern is called 'sleep architecture'. Just like the ECG machine that records the heart's activity, there is one modern machine that records the electrical waves in the brain. It is called Electro Encephalo Graphy (EEG). This recording enables us to analyse sleep patterns objectively. Several different types of 'brain waves and patterns are now recognised. Critical studies over the past half century have shown that the best sleep is one that combines a right mix of REM and NREM phases. Getting enough sleep without any interruptions is more likely to maintain the normal architecture of your sleep and thus result in a restorative sleep.

How much sleep do we need?

In general, most healthy adults sleep for eight hours. However, sleep needs vary. Some can do with six hours; some others may need up to ten hours. Young boys and girls (10 - 12 years of age) may sleep for eight to nine hours. A few years later, the same boys and girls need at least one hour more. But the pressures of the present day education do not allow them that luxury. Such deprivation may affect their behaviour and also learning capacity. As age advances, they need less sleep. By 60 years, the elders sleep for only 6 - 7 hours; In addition, the elders may find it difficult to get all the sleep in a single session.

So, how do you find out just how much sleep YOU, as an individual, need? If you feel sleepy during monotonous situations like watching television, attending a meeting or travelling in a bus, it means that you have not had a restorative sleep in the previous night. This leads to excessive daytime sleepiness (EDS). A special questionnaire called Epworth Sleepiness Scale (ESS) had been developed specifically to assess excessive daytime sleepiness. This scale is used widely to identify patients with sleep disorders and in treating them.

Sleep stealers

Almost each one of us will have an occasional day of poor sleep. But, some of us continuously suffer poor sleep. What are the usual causes for such insomnia.

Students, travellers, shift workers and stressed and depressed persons do not get good sleep. In women, special situations like pregnancy, menstrual periods and lactation may disrupt sleep architecture either directly or through the actions of hormones. Some medicines commonly used in medical conditions like hypertension, allergy etc., may produce sleepiness; certain other medicines may induce restlessness and prevent proper sleep. Quite obviously, whatever might be the cause, a defective sleep can not be restorative.

How snoring is produced?

Some diseases and some anatomical abnormalities block the nose, throat and the voice box. Such a block obviously will prevent air from entering the lungs. This stoppage of breathing is called Apnoea. Apnoea reduces the oxygen level of the blood and rouses the man. On arousal, the person starts to breathe again. This kind of disruption may occur several times in a single

night. This disorder is called Obstructive sleep apnoea (OSA). In OSA, the sleep is thus fragmented and becomes inadequate. The next day, he might feel unrefreshed and extremely sleepy. An OSA which also accompanied by excessive sleepiness is termed Obstructive Sleep Apnoea Syndrome (OSAS). Sleep apnoea can also occur due to disturbances of the neural control mechanisms, situated in the brain. Also, apnoeas could occur due to defective lungs and heart. Such sleep apnoeas are named Central Sleep Apnoea (CSA).

Mechanism of production of Snoring: An obstruction to the breathing sets up eddy currents in the inspired air. Such turbulences cause the palate and the throat walls to vibrate and make noise. This is how snoring is produced. Thus, snoring becomes an important pointer to OSA. The main culprit is not snoring, but the apnoea. This apnoea is a sinister phenomenon that creates havocs like lung diseases, heart enlargement, irregular heart beats, high blood pressure etc. Sometimes, even death can result. Thus, a sleep with sounds is not a 'sound sleep'. On the contrary, a snore portends potential trouble. Obese persons are prone to snore heavily; however, rest assured that snoring does not always mean apnoea. Only a few snorers may actually have OSA. Snoring unaccompanied by OSA is called simple or primary snoring.

Other than snoring and OSA, what are the other disorders associated with sleep?

Insomnia: Poor sleep might be of three types: (1) inability to fall asleep (2) inability to sleep continuously i.e. getting arousals too often (3) inadequate hours of sleep. All the three above are collectively known as 'insomnias'. Thus, insomnia can be due to defective initiation, defective maintenance or inadequate total hours of sleep.

Restless Legs syndrome: Some people get a strange crawling sensation and pain in their legs just before sleep; this may prevent them from sleeping; they may toss and turn about in bed; some might even kick the unfortunate person sleeping next. This condition is also a sleep disorder and is called 'restless leg syndrome' (RLS). Massaging of the legs or a bit of walking might relieve this problem. When I was a kid, my grandmother used to ask me almost every night to stand with my tiny feet on her legs and to press; then only she could go to sleep. Now, long after my grandmother has reached heavenly bliss, do I realise that what my grandmother had, could have been RLS.

Narcolepsy: There is one other peculiar condition wherein the person has persistent daytime sleepiness, regardless of the nocturnal sleep obtained. This condition is called 'narcolepsy'. These individuals exhibit a 'tetrad' of (i) excessive sleepiness during daytime (ii) cataplexy i.e. sudden loss of power in their limbs precipitated by strong emotions, while being awake (iii) sleep paralysis i.e. inability to move their limbs during the transition into or out of sleep and (iv) hallucinations while beginning to sleep. This narcolepsy can be quite frightening to the patient and the onlookers and may disrupt affect the individual's career and social life. Recent studies indicate that this is a neurological condition affecting the posterior part of the brain. Thus, there are several nuances in the study of sleep. Each has a different pattern and different treatment. But all impact our well being and success in life.

Ten simple tips for getting a nice and relaxed sleep:

Almost everyone would have experienced sleepless nights. The reasons might be any one of the above conditions. But, by far, the commonest reason is external disturbance like noise or light. In a majority of instances, the following simple life style changes have been found to be effective.

1. Get used to a set routine of sleep times. If you usually take after noon naps and if you have trouble in getting into sleep in the night, skip that afternoon nap.
2. Avoid stimulants like coffee, smoking and alcohol in the hours preceding sleep.
3. Avoiding bright lights before sleep time might help.
4. You may try exercising; but, take care that there is at least a three hour gap before the sleep time.
5. A hot bath might also help.
6. The sleep environment must be as quiet, pleasant and dark.
7. A good bed is essential for a relaxed body habitus. Earlier, it used to be thought that a firm bed is the best. But, with further studies, it had been found that a supportive bed is the best. Here is a tip. When buying a bed, lie down in the bed for at least ten minutes. You should do this in the shop itself. Do not feel shy to do so. Try out several postures, before deciding. Do this simple test: Lie on the bed, face up with the arms by the sides. Try to insinuate your hand between the small of your back and the surface of the bed. If there is a wide gap, the bed is too hard. If your hands have to be pushed hard (requiring a little wriggling of your body), the bed is obviously too soft. Do not buy these two types. A bed which just allows your hand to pass snugly is the one you require. Buy it.
8. Use the bed only for sleeping and for sex. If you do not get sleep within 20 - 30 minutes after lying down, do not continue lying in bed. Counting sheep is 'passe'. Get up. Go to the next room and engage in some relaxing work like listening to music or reading some novels. During this time, never attempt to finish off that file that you had brought home. Nothing serious should be started at this hour.
9. If your body habitus is on the heavier side, a little moderation in your food will be necessary. An objective measure of your fattiness is the Body Mass Index (BMI). This measure is easily calculated by measuring the height and your weight. Thus, it will be prudent to keep your weight in check, by a combination of exercises and diet.
10. At all times, reduce intake of oily food. This maxim is particularly applicable in the nights. Fats take a minimum of three hours to leave the stomach. In certain persons, the lower oesophageal valve is incompetent and allows the gastric contents (acidic in nature) to reflux back into the oesophagus and the mouth. This gives rise to a burning sensation in the chest. This burning pain is called 'heart burn' (quite erroneously). This particular condition is called 'Gastro Oesophageal Reflux Disease' (GERD). Hence, never go to bed with fatty food in the stomach. If you have had a binge, stay up for at least two hours after food.

How do I know whether my problem requires a doctor's help or not?

If your sleep problems persist for more than a few weeks, or if the lack of sleep interferes with your day time alertness and prevents you from working efficiently, you

will have to discuss this with your doctor. During that visit, try to be as objective as possible. Keeping a diary of your sleeping times in the previous week or fortnight will be a great aid. For a majority of patients, simple interview and clinical examination will help to eliminate any serious problems. If necessary, he may either order a few laboratory tests himself or refer you to an appropriate specialist. For some patients, an ENT examination may have to be done. A small percentage of persons may require direct observation of their sleep patterns by highly specialised techniques like Poly Somno Graphy (PSG). A polysomnography requires you to sleep overnight in a sleep laboratory. During that time, several parameters like breathing, electro encephalography, heart functions and lung movements will be monitored. Such observations will help to discern the type of your sleep problem and the appropriate treatment can be started. This is an expensive test both in terms of money and in terms of time required. A full facility machine is not yet widely available even in large cities. However, as awareness increases among the general populace, the demand will hopefully be met.

Treatment options available at present:

The most important part of treatment is to rule out sinister causes of insomnia and daytime sleepiness. The first task will be to identify cases systemic reasons of insomnia, which are secondary to other diseases and occasionally, the drugs used in their treatment.

The next step will be to differentiate cases of 'central apnoea' i.e. central causes involving the heart, lung and the brain. Once identified, the primary cause will have to be treated.

The above algorithm leaves us with OSA. The obstruction could be in any portion of the airway; however, commonly, five areas are found to be the significant:

1. Nose, nasopharynx (adenoids)
2. Palate
3. Oral cavity(tonsils),
4. Posterior third of tongue
5. Lax pharyngeal walls

If any such obstruction is present, surgical relief is indicated. Conventional surgical methods involve removal of obstructions in the nose, removal of adenoids, removal of tonsils or volume reduction of an enlarged tongue. Further, any laxity in the palate or in the walls of the throat will have to be corrected.

In patients who are bad surgical risks and those who are reluctant to undergo conventional surgery, a recent technological advance called radio frequency surgery (RF) provides a good option. The RF surgery can be done as an out patient procedure in several patients; the need for hospital stay is eliminated; however, the procedure may need more than one session.

Another non surgical option is a machine that constantly blows air/ oxygen into the nose and mouth while sleeping and thus keeps the airway open. This machine is called Continuous Positive Airway Pressure apparatus (CPAP). When properly fitted and used, the CPAP gives very good benefit. But it engenders lifelong dependence on that machine, Even for a weekend travel, patients have to carry the CPAP (an extra 20 - 25 kilos). The mask that should be worn on the face while sleeping puts off several patients and their partners. Additionally, repair and proper maintenance of CPAP require specialist engineers. Because of such inconveniences, several patients and doctors prefer surgical options.

Summary:

Sleep is a critical component of life. Sleep restores and rejuvenates the body functions. Lack of sleep leads to some serious diseases and also results in loss of productivity. In all cases of Sleep disturbance, life style changes like reduction of weight and sleep hygiene must be initiated first and must be continued throughout. Keeping in mind the possible risks of snoring and sleep apnoea and considering the fact that this is an eminently preventable condition, all snorers and insomniacs must be examined in a discerning manner. At the present level of technology, treatment is available. In several instances, such treatment can be very rewarding.