Sleep on it

Rest does not come easy to everyone, especially the obese who may be prone to sleep apnea. **By Lim Ing Ruen**

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'DOC, I don't sleep well. I snore, kick around in bed, choke and even sometimes stop breathing. My wife even wakes me up to remind me to breath. I feel so tired, my eyes are dark, my skin is sagging, my waist is bulging and my memory is fading! I keep on falling asleep in the day, even while driving. I am afraid of getting into an accident or out of a job. My marriage is suffering.'

Sleep and breathing have been the subjects of interest for writers, scientists and philosophers alike for a long time. In ancient Greek mythology, Hypnos is the personification of sleep, while his twin brother Thanatos is that of death. These two "children of the dark night" have their fates entwined. Thus, there's always been some understanding that sleep is essential to good health and long life.

Modern science has classified sleep disorders into dyssomnias and parasomnias. Dyssomnias affect the duration of sleep and include both insomnia (inability to sleep) and hypersomnolence (chronic sleepiness). Parasomnias involve abnormal and unnatural movements, behaviours, emotions, perceptions, and dreams, such as sleep terror, sleep talking (somnosoliloquy), sleep walking (somnambulism).

Hypersomnolence or chronic sleepiness is less notorious than insomnia, but it is actually more serious as it is a sign of breathing problems and lack of oxygen in sleep. The most common cause is obstructive sleep apnea where the upper airway is blocked by large tonsils, large tongue, blocked nose or increased body fat. A rarer cause of sleepiness is central sleep apnea where the brain fails to tell you to breath, as in the Ondine's Curse.

Sleep apnea and oxygen starvation

Charles Dickens captivated our imagination in his perceptive description of hypersomnolence in a "wonderfully fat boy" named Joe in the *Pickwick Papers*. Joe is constantly hungry and very red in the face. Joe is always asleep. Goes on errands fast asleep, and snores as he waits at tables. The term Pickwickian Syndrome was coined in 1956 to describe morbidly obese people who cannot breathe properly during sleep, resulting in a lack of oxygen and retention of carbon dioxide causing them to be constantly drowsy.

The Pickwickian Syndrome is part of a big group of sleep disordered breathing where sufferers stop breathing up to 10-40 seconds intermittently. This is called Sleep Apnea. There is no air exchange in the lungs during apnea. Body tissues are starved of oxygen. The heart struggles each time in vain to drive blood more quickly causing excessive cardiac strain and episodes of palpitations. The brain wakes up sublimally ever so often in an attempt to gasp for air. These micro arousals take their toll on memory and alertness. The legs kick in spasms of paroxysmal leg movement.

The nocturnal lack of oxygen releases stress hormones in a "flight and fight" response, causing gradual resistance to insulin. This raises sugar levels leading to diabetes. The lack of oxygen also causes imbalance in leptin and ghrelin that regulate satiety and hunger. The body starts to store more fat around the waist. As you put on more fat, the upper airway becomes even more blocked, breathing becomes more laboured during sleep, apnea worsens, metabolism worsens and more fat accumulates.

Sleep apnea and metabolic syndrome negatively impacts on the heart and the brain. 50 per cent of sleep apnea patients have hypertension and 30 per cent have heart failure, heart attack and stroke and more have diabetes. Breathing becomes irregular as more weight accumulates. Snoring may be annoying, but irregular snoring is alarming as it is a sign of irregular breathing.

A recent study on 2,000 Australian teenagers suggests that night owls who sleep less tend to gain weight. Another set of data from the American Centre of Disease Control and Prevention on American teenagers links sleep-disordered breathing to conduct and disciplinary issues. Better let teenagers have adequate rest.

The *WhiteHall II* study from the UK on 1,500 women and 4,000 men aged 45-69 years at baseline was followed over five years. Results show that deviation from the standard seven to eight hours of daily sleep causes a cognitive decline equivalent to five years of aging. Sleeping too little accelerates aging!

The *Hunt Study* published in *Journal of Arthritis and Rheumatism*, on 12,350 previously healthy Norwegian women who were above 45 years of age in 1985 showed that after 10 years of follow-up, those with poor sleep were five times more likely to suffer from fibromyalgia or body aches.

If you snore and feel tired, answer the Stop-Bang Questionnaire. A score of three means you are at high risk for OSA. The STOP BANG questionnaire (Snoring, Tired, Observed apneas, high blood Pressure, BMI >30 kg/m2, Age >50, Neck circumference 15.5 inches, male Gender) is designed by anaesthetists as a screening tool for OSA and is found to be highly accurate in predicting OSA.

Anyone at risk of OSA should see an ENT surgeon or a Sleep Physician for a proper polysomnography or sleep study. The sleep study will tell us how severe the sleep apnea is.

Holistic treatment

Holistic treatment involves a multi-pronged approach encompassing weight loss, throat exercises, surgery to remove sites of obstruction in the upper airway or CPAP (continuous positive airway pressure). Mild apnea responds equally well to both surgery or CPAP, while severe apnea responds better to CPAP.

- Weight loss to achieve an ideal BMI of 23 kg/m2 in Asians and 25 kg/m2 in Caucasians tend to resolve the issue of obstructive sleep apnea. However, weight loss is painfully difficult. The Mediterranean diet is far more superior than usual weight reduction diets as it selectively decreases visceral fat rather than subcutaneous fat. This means that fat in the upper airway can be selectively reduced.
- Throat exercises strengthen the throat and prevent upper airway blockage.
- Sleeping on the side also prevents the tongue from dropping back.
- CPAP or continuous positive airway pressure is the current gold standard of treatment. Air is pushed via a mask into the nose so that the collapsed upper airway is stented open with every breath you take during sleep. In theory, it is the ideal treatment for OSA. In practice, the initial uptake is hampered by psychological resistance and physical discomfort. Long term compliance is not favourable.
- Surgery is aimed at eliminating obvious sites of obstruction. Large tonsils in children with OSA respond to tonsillectomy. Palatal floppiness respond to uvulopalatopharyngoplasty. A large tongue can be reduced using radiofrequency or surgical reduction or can be pulled forward using genioglossal advancement techniques. Nasal turbinate hypertrophy can be addressed with radiofrequency.

Dr Lim is a consultant ear, nose & throat surgeon at Singapore Medical Specialists Centre. She has post-graduate qualifications in Otolaryngology from the Royal College of Physicians and Surgeons of Glasgow, UK and did fellowship in rhinology and sinus surgery at the University of Pennsylvania, US. She also has specific sub-speciality interests in advanced sinus surgery and otolaryngic allergy and sleep apnea surgery. She is a fellow of the American Academy of Otolaryngology, Head & Neck Surgery and a member of the American Rhinologic Society and Singapore Society of Allergy and Clinical Immunology

btnews@sph.com.sg

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