

Case study of sleep disorder and sleep apnea

[Health & Medicine](#), [Sleep Disorders](#)



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Sleep disorder is one of the most vital problem face by many people in life. Mostly face by older generations and adults. Sleeping is controlled by hypothalamus which is one of the part of a human brain system. Body temperature in some way controls the activities of one's body, playing a role like a switch for on/off. Higher temperature brings alertness while lower temperature causes sleep. Sleep disorder comes in many different forms like Bruxism, Delayed sleep phase syndrome (DSPS), Cataplexy Rapid eye movement behavior disorder (RBD), insomnia, sleep apnea, night terrors, nightmares and somnambulism. Interfering with normal sleeping habits frequently and continuously can be listed as sleep disorder. Sleep disorder are capable of influencing emotional, physical and mental health of a human being. Moreover, sleeping disorder not only causes trouble to the victim but the person staying in the same house at them. Polysomnography is one of the a test commonly use to test for sleep disorders. Before the 20th century, sleeping problems are face by many people and there's no cure and research about it but till this century, due to the rapidly increasing knowledge of mankind, many research have been brought up just to find solutions for all diseases. In the UK, most of the research are mainly focus on

sleep apnea but not others as a proof that they are lagging on knowledge of sleep medicine and possibility of treatment in other sleeping disorders.

There are some general principles of treatment that could be found worldwide but mostly in US. Treatments for sleeping disorders can generally be grouped into four different categories that are behavioural/ psychotherapeutic treatments, rehabilitation, medications and other somatic treatments. Treatments such as this does not provide a 100% success and not suitable for all sleeping disorders. History of different people and medical reports of everyone is so greatly different so it is best to say that specific treatment are given to specific patient's diagnosis. Disorders such as narcolepsy are best treated pharmacologically. Chronic sleep disorder influenced 70% of children development and psychologically while sleep-phase disruption affects adolescents who could not attend regular school schedules. Effective treatment will begin with careful diagnosis and modifications in sleeping hygiene may reduce the problem. It is said that special equipments are used for several disorders(obstructive apnea). Research also shows that some sleep disorders are also found to be compromise glucose metabolism.

Sleeping is absolutely the essential thing for a normal and healthy lifestyle, according to the United States, roughly about 40 million suffer from long term sleep disorder while nearly 20 million experience mild/ occasional sleep problems. Sleeping disorder suddenly became an important issue because many more people are facing it and body needs sleep to survive because study shown that sleep is essential for immune system and maintaining the

ability to fight against diseases and sickness. Learning, growing, functions of brains also comes from the amount of rest absorb because it is said that sleeping helps regenerate and repair cells.

Sleep apnea.

Sleep apnea is one of the most well-known sleep disorder face by many and said to be one of the most dangerous disorder to be faced compare to others. Another name for sleep apnea is call sleeping breathing disorder. This disorder is a serious sleep disorder that occurs when a person's breathing is influenced by some activities during sleep. Untreated sleep apnea patients will normally face stop breathing repeatedly during their sleep almost hundreds of time. Facing this disorders means that the brain and body are not getting enough oxygen. There are actually two different kind of sleep apnea: Obstructive sleep apnea(OSA) and Central sleep apnea. OSA is more common of the two forms of apnea and normal the causes is a blockage of the airway usually the soft tissue in the back of the throat collapses during sleep while Central sleep apnea is unlike OSA where there's no blockage but the brain fails to signal the muscle to breath which will due to instant instability in the respiratory control centre. After having modern research from scientist, sleep apnea can affect anyone at any age even children, the causes of having sleep apnea are gender(mostly male) , being overweight, older after the age of forty, having a large neck size, large tonsils, family history and some other problems. Having untreated sleep apnea could cause quite severe effects like high blood pressure, stroke, heart failure, diabetes, depression and worsening of ADHD. Having poor

performances in activities in many different places could be one of the sign of facing sleep apnea.

Sleep apnea can be explained in terms like breathing pauses can last from a few seconds to minutes. This disorder often occurs to 5 to 30 times or more per hour. Normally, normal breathing starts again with a loud snort or choking sound which can be easily detect by family members sleeping around them. Sleep apnea often goes undiagnosed while doctor usually can't detect this symptoms so soon. Obstructive sleep apnea is very common with overweight people and happens randomly too, when a person who has sleep apnea tries to breathe, any air that squeezes past the blockage will produces a loud snoring. Some research found out that Central sleep apnea happens less but random while it mostly occur on people that have certain medical conditions or is using certain medicines. Regardless of type, an individual who has sleep apnea will rarely be aware of themselves having difficulty breathing during sleep and even upon awakening. This problems mostly are being recognized as a problem by other witnessing the individual.

Some treatments can be found to treat Obstructive sleep apnea which involve the lifestyle changes, such as avoiding drinking alcohol or muscle relaxants, weight lost and quitting smoking. Sleeping at a 30-degree elevation of the upper body or higher can be use as a recliner that helps prevent the gravitational collapse of airway while sleeping on a side as opposed to the sleeping on the back theory are also recommended as treatment for sleep apnea because the gravitational component is smaller for lateral position while some people are benefiting through various kinds of

oral appliances to keep the airway open. There's a treatment called Continuous positive airway pressure (CPAP) while other surgical procedures to remove/tighten tissue while widen the airway. Snoring does not actually mean a person is having sleep apnea but mostly overweight people who snores loudly and hardly during sleeping could actually mean sleep apnea. In US, researches revealed that people with OSA has tissue loss in brain regions that store memory (hippocampus) which somehow linking OSA to memory loss. Scientists discovered that people that has OSA mammillary bodies are 20 percent smaller than normal people mostly on the left region of the body which is because of repeated drops of oxygen that lead to brain injury.

In pure central sleep apnea or known as Cheyne-Stokes respiration, the brain's respiratory control centres are imbalanced during sleep while the blood levels of carbon dioxide is higher compare to normal people sleeping and the level of oxygen is lower. The sleeper will stop breathing and then starts breathing again. No effort made to breath, no chest movement and no struggling. In central sleep apnea, the basic neurological controls for breathing rate cant functions and fail to provide signal to inhale.

Some people are facing the combination of both type of sleep apnea. Combinations of obstructive sleep apnea and central apnea by loss of central respiratory drive during sleep in OSA. The presence of central sleep apnea without an obstructive component is a common result of abuse by owing to the characteristic respiratory depression that are mainly cause by large doses of narcotics.

Obstructive Sleep Apnea can be determined by having a sleep test which is called polysomnography which is usually done to diagnose sleep apnea. Actually there are two kinds of polysomnography, an overnight polysomnography test that involves monitoring brain waves, muscle tension, eye movement, respiration, oxygen level in the blood and having audio monitoring. The second kind of polysomnography test is called a home monitoring test. A sleep Technologist sticks you up with all the electrodes and instructs you on how to record your sleep with a computerized polysomnography that user can take it home and return the computerized polysomnography in the morning. These tests are painless tests that are covered by insurance.

Sleep apnea can be treated in many ways but for severe apnea, there is a Bi-level (Bi-PAP) machine that is different in that it blows air at different pressures. That's when a person inhales, the pressure is higher while exhaling the pressure is lower. Your own doctor will measure the pressure and a home healthcare company will set the apparatus hence providing training user to use and maintain it. Tracheostomy is the only treatment available until early 1980's. It's a surgical procedure where a small hole is cut in the neck and a tube with a valve is inserted into the specific hole. During the day, the valve is closed so that the patient can speak while the valve is open at night to avoid obstructions. This treatment is now the last resort for sleep apnea for you must be extremely sick to require this.

Uvulo-palato-pharyngoplasty (UPPP) is the treatment available today which means plastic surgery of the pharynx (the pharynx is the joint opening of the

gullet and windpipe). This surgery is usually done for patients that cannot tolerate with nasal CPAP. This surgery has help around 50% people and still others do not. Laser Assisted Uvuloplasty(LAUP) is a surgical procedure that remove the uvula and surrounding tissue that open the airway behind the palate. This procedure is said to be used to relieve snoring while somehow successfully treating sleep apnea, before doing this surgical treatment, make sure you have a doctor that has experience doing this procedure with extreme knowledge about sleep apnea. The latest treatment for sleep apnea will be called somnoplasty, getting approvable from US Food and Drug Administration, this treatment uses radio waves to shrink tissue in air passages and almost eliminating all snoring problems. This special and safe procedure is called radiofrequency volumetric tissue reduction of the palate. This radiofrequency treatment involves piercing the tongue, throat or soft palate with a electrode needle(special needle specific for this treatment) that is connected to a radio frequency generator. The inner tissue is then heated to about 158 to 176 degrees and takes approximately nearly half an hour. The inner tissues are shrinking while the outer tissue such as taste buds are left intact. Several treatments may be required. This treatment should only be carry out after doing a lot of research and getting the advantages and disadvantages of each different treatment, because some might have side effects.

In summary of sleep apnea, the causes of sleep apnea maybe family historical backgrounds but it might be also connected to the body weight of each individual. Make sure to take care of own body after over the age of forty and having large tonsils or tongue might causes sleep apnea. Sleep

apnea is one of the most dangerous sleeping disorder that can actually kills the patient instantly because this sleeping disorder interrupts a person during their sleep and the patient wouldn't even know what happen after they get awoken due to lack of oxygen. Sleep apnea prevents breathing from happening and causes lower level of oxygen to be transported to all part of body. There are two kinds of sleep apnea: obstructive sleep apnea and central sleep apnea. Obstructive sleep apnea happens when blockage of airway occur while central sleep apnea happens when the brain fails to signal the muscles to breath to intake and exhale oxygen and carbon dioxide in and out of the body. Sleep apnea prevents natural sleeping hence causing high blood pressure, stroke, heart failure, diabetes, depression and many more. Sleep apnea cannot be left untreated because if a human stops breathing, high chance that the person might just die. There are a few variety of treatments for sleep apnea including continuous positive airway pressure(CPAP), variable positive airway pressure(VPAP), automatic positive airway pressure(APAP), Bi-level(Bi-PAP)machine, TRACHEOSTOMY, UVULOPALATOPHARYNGOPLASTY(UPPP), MANDIBULAR MYOTOMY, LASER ASSISTED UVULOPLASTY(LAUP) and RADIO FREQUENCY(RF) PRODECURE OR SOMNOPLASTY. All these treatment are mainly focusing on removal of uvula, cutting bone in anterior portion of mandible or having a small hole to let air diffuse in.

CASE STUDY: SLEEP APNEA

Sleep apnea is a common but potentially dangerous sleep disorder which can be characterized by repeated pauses in your breathing while asleep. These pauses can last from a few seconds to minutes and can occur thirty or more

times per hour. Apneic events usually stop with a loud snort, snore or choking sound which can often momentarily wake you up which will then cause regular breathing to resume. From the research of Emily Cashman, BS, RRT, the clinical training manager at ResMed in Poway, Calif, diabetes and obstructive sleep apnea (OSA) are common disorders that often coexist. In fact, they are equally prevalent within the U. S. adult population. OSA can affect anyone, including children. However, the population typically associated with the disorder includes overweight adults who snore heavily. Sleep apnea is more common in men, and 50% of type 2 diabetic men also have OSA. There are many treatments for sleep apnea. Any practitioner can identify OSA symptoms. Patients are then referred to a sleep specialist, and an overnight polysomnography is conducted in a sleep laboratory or the patient's home. The standard treatment is continuous positive airway pressure (CPAP). The air pressure functions like a splint for the upper airway to prevent apneas from occurring and keep the airway from collapsing. This permits normal breathing to continue during sleep, normal sleep patterns to emerge, sleep to become restorative, and the patient to feel better. The impact is often immediate and dramatic. The success of treatment is measured by the reduction of respiratory disturbance to normal levels, the elimination of symptoms such as fatigue and depression, and improvement in the patient's subjective feeling of well-being. Effective treatment will eliminate snoring and apnea events and has demonstrated decreases in blood pressure and post-prandial glucose levels within 30 days. OSA is often overlooked and misdiagnosed. Complaints of fatigue and sleepiness are attributed to lifestyle, stress, other medical conditions (such as diabetes), or

side effects from medications. Sleep apnea should be investigated when patients present classic symptoms. There's a 61-year-old man called J. B who is a busy physician and has had type 2 diabetes for 11 years. He suffers from gastroesophageal reflux disease daily and has moderate depression. For 11 years, he has maintained a weight of 210-220 lb (BMI of 31 kg/m²), and he does not have hypertension or hypercholesterolemia. J. B. has no other known diabetes complications. He uses a low-carbohydrate meal plan and a bicycle exercise program. However, he snores and reports being excessively sleepy all the time. Type 2 diabetes is a chronic (lifelong) disease marked by high levels of sugar (glucose) in the blood. It is also the most common form of diabetes. J. B. has no family history of diabetes or sleep apnea. During the past year, he has not been able to get his plasma glucose levels to < 200 mg/dl. His haemoglobin A1c (A1C) has been 7. 5% (lab norm) on the past two visits. The patient denies polyuria or nocturia. He is in bed for ~ 8 hours per night. His wife does not complain about his nighttime snoring, but she describes herself as a heavy sleeper. The bed partner is often the first to complain of sleep apnea. In this case, J. B.'s wife is not bothered. However, fellow physicians who travel with J. B. on medical mission trips joke and complain about his snoring and gasping. J. B. now requests a private room for these trips to avoid the complaints. He did not share this information with his diabetes care team. J. B. is excessively sleepy, yet he sleeps ~ 8 hours nightly. Colleagues and family who sleep in adjacent rooms have told him that he snores and gasps throughout the night. Published research demonstrates that 50% of men with type 2 diabetes have sleep apnea. These factors are sufficient to suspect sleep apnea and inquire further. J. B.'s

fatigue and sleepiness finally led him to refer himself to a sleep lab in August 2005. Because he is a physician, he felt certain he had sleep apnea by the time he contacted his friend, the medical director of the sleep lab. The vast majority of patients are referred to a sleep lab or sleep specialist by their physician for further evaluation of symptoms. It is common for patients to complete a Berlin Questionnaire, a simple validated 10-item questionnaire certified by the American College of Physicians. Questions focus on BMI, snoring, sleepiness, and blood pressure. J. B.'s results for the Berlin Questionnaire indicated a borderline acceptable BMI, severe snoring, severe daytime sleepiness, and an acceptable blood pressure. These results indicate a high risk in two categories of the Berlin Questionnaire, suggesting a strong likelihood of sleep apnea. J. B. underwent a sleep study and, because of the severity of his sleep apnea, a split night protocol was initiated. This means that the first portion of the sleep study (diagnostic) was so severe that the patient was placed on CPAP therapy for the second portion of the night (titration). An apnea/hypopnea index (AHI) of 51 was reported during the diagnostic portion of the study, indicating severe obstructive sleep apnea. Although some patients are able to reduce their AHI to normal levels with weight loss, few patients are able to maintain this type of weight loss. CPAP therapy is the gold standard sleep apnea treatment. CPAP therapy ranges from 4 to 20 cm H₂O pressure. J. B. required a pressure of 8 cm H₂O. The pressure needed to resolve 95% of apneic events throughout the night determines this therapeutic pressure. J. B. went home with a prescription for CPAP, and a local home care dealer delivered his therapy that day. He has slept with CPAP every night since. He reports feeling great, and his family

members have noticed a huge difference in his enthusiasm and energy. From the research, it is known that CPAP treatment can improve insulin responsiveness without a significant change in obesity. This occurred in J. B.'s case. Although his weight and diet have not changed, his glucose levels have improved dramatically and are now consistently < 150 mg/dl. His A1C was 6.5% 9 months after initiating CPAP therapy, and his medications have been reduced. It is a great news for him and his family.

SUMMARY

In fact, people that have diabetes will probably suffered from sleep apnea. Sleep apnea is very common in diabetic populations but typically goes undiagnosed. Sleep deprivation from any cause increases blood glucose, blood pressure, and triglycerides, causes higher evening cortisol levels, reduces serum leptin secretion, and increases inflammatory cytokines. Patients with chronic snoring and untreated sleep apnea have a higher risk of both stroke and cardiovascular disease. Although most of these patients do have a higher BMI as well as low activity levels and hypertension, it is also possible for patients with normal BMIs and without hypertension to present with snoring and sleep apnea. Sleep apnea can be associated with recent weight gain. Tiredness can cause people to eat for stimulation and skip exercise. Over time, these habits result in obesity, which can worsen sleep apnea, leading to a progression in severity of both conditions. Treating sleep deprivation rapidly reverses these metabolic abnormalities. The reasons for this are complex but seem to include increased sympathetic nervous system activity and adrenal cortisol and catecholamine output. Well, sleep apnea can cause hypertension, nevertheless hypertension is not required for

suspicion of sleep apnea. Besides that, treating sleep apnea with CPAP therapy can improve glycemic control and blood pressure. Berlin Questionnaire can also easily conducts an assessment for sleep apnea.