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The Health Benefit of Sleeping and Related Sleep Disorders

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Abstract

Rapid Eye Movement sleep occurs as blood flows through the arterial blood vessel, neuronal firing rates, and metabolism. This causes an increase in temperature in many parts of the central nervous system (CNS). However, REM sleep serves as a homoeothermic use to produce heat in order to maintain a high, stable temperature in a restricted central nervous system core during sleep. REM sleep is a regulated mechanism for warming the CNS. The "selection "of the brain network appears as a result of REM sleep. Mostly, Non-Rapid Eye Movement and Rapid Eye Movement sleep have contributed to the overall function of sleep. There is an alternation between Non-Rem and REM sleep which contribute to the overall function of sleep. Basically, the function of sleep is to provide "recovery" after proceeding waking activities, the recovery process comes as a result of interconnected neural network. and this aid in information processing, synaptic plasticity and cellular maintenance there by ensuring optimal functioning during subsequent wakefulness. If one of the functions of sleep is to conserve energy, then it is curious that energy is conspicuously expended in the vicinity of the central nervous system.

Keywords: Sleep apnea, Narcolepsy, REM sleep, Non - REM sleep, Obstructive Sleep Apnea, and Insomnia

INTRODUCTION

The brain is divided into three different categories these are as follows:

- Brainstem: which serves as a bridge between the cerebrum and cerebellum.
- Cerebrum: largest portion of the brain comprising right and left hemisphere.
- Cerebellum: this is found right under the cerebrum.
- During sleep, the brain moves in five stages.
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- These Stages are known as:
- REM Sleep
- NON - REM sleep (which consist of four other stages).

REM Sleep

Within the first 90 min of every sleep, REM sleep occurs immediately. At night, the sleep cycle occurs concurrently. REM sleep accounts for 20-25% in adults and 50% in infants [1]. The amount of REM sleep reduces when a person takes in alcohol before going to bed. The circadic rhythm is reduced by drockling effect which confuses the body internal clock. The effect of REM sleep has been linked to lack of sleep or sleep deprivation, which leads to a lack of defensive responses and coping mechanism in threatening situations. The National Sleep foundation have shown a profound benefit in association with REM sleep. When a person is unable to get enough REM sleep, he or she will find it difficult to remember what he/she was taught before going to sleep. Lack of REM sleep for four days can lead to cell profilation in the brain which aid in neural simulation and good memory mood [2,3].

NON - REM Sleep

This involves four stages; at the first stage the person falls asleep lightly. At the second stage, the person falls into a slightly deeper sleep. Finally, in the third and fourth stages which are also known as restorative sleep or delta sleep. Various activities take place during the NON-REM sleep such a, energy is replenished and stored, as well as the release of hormones. Moreover, there is also the repair of won out tissues and an increase in sexual arousement [4].

A research carried out in JAMA Neurology gave an indication that day time sleeping shows a sign of Alzheimer's Diseases. One of the symptoms of Alzheimer's disease is noted with been sleepy during day time. Research says that genetic factors are one of the contributing factors of Alzheimer's

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disease. It leads to robbing people of their memory which is known as a degenerative brain disorder **(Figure 1)**.

Figure 1. Picture showing a person suffering from Alzheimer's disease.

Sleep Disorders

Basically, there are three (3) types of sleep orders [4,5]:

1. Narcolepsy.
2. Insomnia.
3. Sleep Apnea.

Narcolepsy: This is a type of sleep disorder that that affects a person's sleep cycle and wake cycle and it can lead to neurological disorder.

Insomnia: The in ability to get the right amount of sleep or fall asleep is known as insomnia. Insomnia can be chronic or acute, lasting for months or years.

Sleep Apnea: Happens when there are pauses in breathing during sleeping.

There are two types of Narcolepsy (Figure 2)

Narcolepsy is a sleep disorder characterized by excessive sleepiness, sleep paralysis or hallucinations. Narcolepsy occurs equally both in men and women. There are two main types namely:

Narcolepsy without cataplexy: This type of symptoms has all the symptoms of narcolepsy but without muscle weakness triggered by strong emotions.

Narcolepsy with cataplexy: The type of symptoms occurs when there is sudden muscle weakness and lose control of the muscles in their face, arms, legs, or torso.

Figure 2. Picture showing a person suffering from Narcolepsy sleep disorder.

Sleep Apnea

It is common in Germany and United States. Normally, there is a pause in breathing during sleeping. These pauses can last for a few minutes or seconds. During sleep apnea the brain and the rest of the body may not get enough oxygen.

Types of Sleep Apnea

There are three categories of Sleep apnea namely:

1. Obstructive Sleep apnea.
2. Central Sleep apnea.
3. Mixed Sleep apnea.

Characteristic of Sleep Apnea

- It is characterized by pauses in breathing or period of shallow breathing during sleeping.
- It occurs several times at night (100 times).
- The pauses may last for few seconds or minutes.
- It is followed by a loud snoring.

Mechanism of Sleep Apnea

- Carbon dioxide builds up in the bloodstream.
- The high carbon dioxide levels in the blood stream are stored in Chemoreceptors.
- The brain is signal to wake the person sleeping and breathe in air.
- Oxygen levels are restored if the person fails to sleep again.

Difference Between of Central Sleep Apnea and Obstructive Sleep Apnea

- In CSA a lack of breath causes breathing to stop.
- 0.4% is noted for CSA and 84% for OSA.
- 15% are for mixed sleep apnea.

- In OSA, breathing is interrupted by a blockage of airflow (**Figure 3**).

Obstructive Sleep Apnea

Sleep apnea occurs in various forms, but the most common among them is sleep apnea. It causes breathing to repeatedly stop and start during sleep. When a person's throat muscles are intermittently relaxed and blocked the airway during sleep, a noticeable sign of obstructive sleep apnea occurs **(Figure 3).**

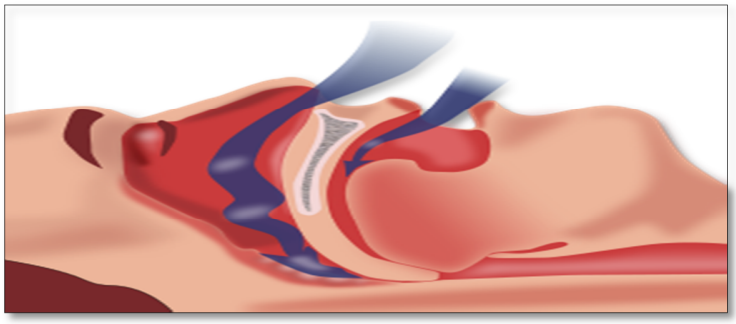

Figure 3. Picture showing an Obstructive Sleep Apnea.

Central Sleep Apnea

- When transmitted signals are not sent to your breathing muscles as a result of brain failure, central sleep apnea happens.
- No effort is made to breath for a short time.
- Enough oxygen is not transported to the brain and the rest of the body.
- There is difficulty in sleeping.

Mixed Sleep Apnea

- Is a combination of both central sleep apnea and obstructive sleep Apnea?
- It often begins with Central Sleep Apnea and develops into Obstructive Sleep Apnea.
- Infants who have abnormal control of breathing normally experience this condition.

SLEEP RESTRICTIONS

- Sleep deprivation or sleep restriction is defined as not getting the right amount of sleep.
- It can lead to craving and increase hunger.
- Ghrelin which is a hunger hormone is produced when there is lack of sleep.

SLEEP SOLUTION

- Sleep studies are used by physicians to diagnose sleep disorders such as insomnia, sleep apnea and narcolepsy.
- A research was carried out by W. Christopher Winter in April 4, 2017 on why your sleep is broken how to fix it back.
- A proven programme is conducted to teach babies on how to sleep (The baby sleep solution) which was originally published in December 5, 2006 by Suzy, Giordarro, Lisa Abidih

BABY LULLABIES (Figure 4)

Figure 4. Picture showing a child listening to baby lullabies.

PREVENTIVE MEASURES

Positive Airway Pressure

Positive airway pressure (PAP) is usually, used a method to treat sleep apnea. It is an equipment that is use to pump air under pressure through. This is purposefully use to prevent airflow blockage (breathing) in people with obstructive sleep apnea (**Figure 5**).

Figure 5. Picture showing a Patient with a Positive Airway Pressure (PAP) Machine.

Continuous Positive Airway Pressure Therapy (CPAP)

This is an equipment developed to prevent air collapse during breathing in a person suffering from obstructive sleep apnea. Continuous positive airway pressure therapy (**CPAP**) is used to assist a person who have difficulty in breathing easily (**Figure 6**).

Figure 6. Picture showing a Patient with a CPAP Machine.

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