Evaluation of The Role of Polysomnography in Treating Obstructive Sleep Apnoea Diagnosis and Treatment

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Abstract
This study is based on polysomnography which is also known as sleep studies. It helps to find out the sleep disorder and it also can recognize the pattern of sleep, brain waves, and frequencies. This process uses some seasons that are attached to the body of patients and those sensors are also connected to the computer by wires. It can records the all data of the body and professionals monitor the entire system and root problems of the difficulties. After finishing the whole test they prescribed medication, exercise, and other advice for the patient. It can improve the patient sleep problems and also make the improvement on the air passing ways by providing modern machines such as CPAP, and BiPAP. It provides a high flow of air that helps the person to recover from the disease.

Keywords: Polysomnography, sleep cycle and stages, CPAP or "Continuous positive airway pressure", biPAP or bilevel positive airway pressure, obstructive sleep apnoea, sensor, OSA diagnosis

Introduction

 Polysomnography is known as sleep study and it can track sleep disorders and also can record brain activity and frequencies. Polysomnography is the process that can also record the

waves of the brain and measure the oxygen level in the blood, breathing, and heart rate. This study also can observe and measure the leg and eye movement during the procedures. Sleep apnoea is a serious kind of disorder when throat muscles get too much relaxation and prevent normal breathing. These kinds of muscles support the entire structures, including the soft palate and the triangular part of tissues that hang from the uvula, the tongue, and the tonsil. Sleep apnoea is responsible for daytime tiredness, loud spring, or other serious issues such as high blood pressure or heart problems. This condition is much different from primary or regular snoring and it is also connected with different kinds of symptoms such as excessive sleepiness in the daytime, headache, dry mouth, and restless sleep. Polysomnography is able to monitor the stages of sleep and identify the cycles. On the other hand, this process also helps to identify the pattern of sleep and the reason for disruption. There are various kinds of devices that use different kinds of sensors and generally it can also record the rate of breathing, the flow of air as well as heart rate and oxygen level. This study will further discuss obstructive sleep apnoea treatment and diagnosis.

Literature review

Concept of polysomnography and obstructive sleep apnoea

Polysomnography is the process of study that is based on the sleep study and it is able to diagnose the sleep disorder. It is able to record the waves of the brain, and measure the oxygen level of blood, breathing, and heart rate as well as track leg and eye movement during the process [1]. This process also diagnoses the sleep disorder and helps to initiate and also plays a major role in the plan of treatment that helps to recover the issues. Polysomnography can monitor the stages of sleep and cycles that help to identify the patterns of sleep. There are various kinds of sleep apnoea test devices. Polysomnography technologies monitor the entire sleep stages throughout the night and monitor the air pressure that helps to find the way of passage of airflow and air passing way [2]. On the other hand, polysomnography can provide a positive airway pressure machine for the disorder of sleep. This is a device that consists of a tight-sealing nosepiece that provides a gentle air stream that helps to enhance breathing. CPAP or *"Continuous positive airway pressure"* is one kind of PAP machine that is able to deliver a constant stream of air that helps to open the passage of air during sleep. On the other hand, biPAP or bilevel positive airways pressure or bPAP machines can deliver more pressure in breathing and lower pressure in exhaling. Polysomnography is able to cure sleep apnoea which helps to cure the disease and make an impact on the nasal passage and improve the breathing system [3]. Sleep apnoea is a serious condition that hampers the lifestyle, and it can be responsible for high pressure, heart problems, and many other serious issues.
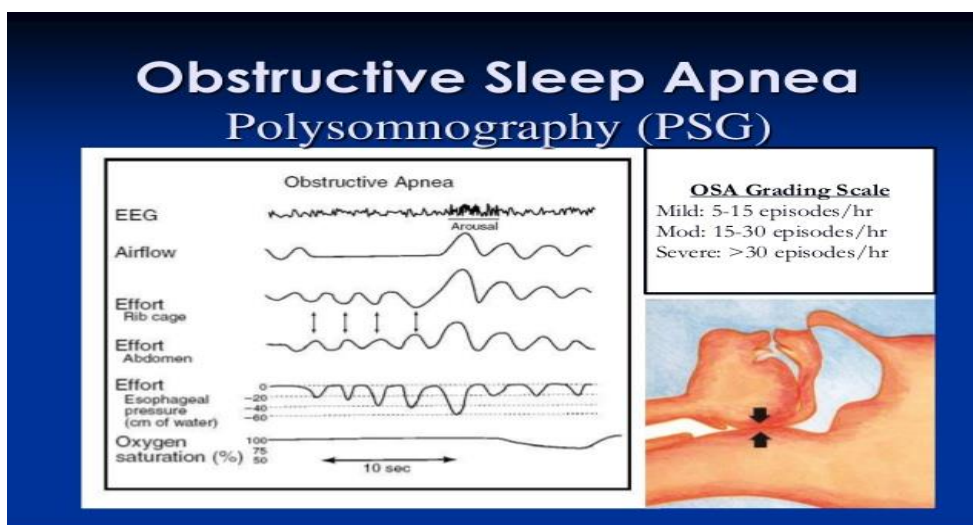

Figure 1: Polysomnography
(Source: 4)

In order to fix sleep apnoea, individuals need to maintain their body weight, change their habits such as smoking, food habits, and daily routine, and use medication. All the factors can recover and control sleep apnoea disease and also improve an individual's well-being. Obstructive sleep apnoea is a condition that can block the upper part of the airway during sleep. This time chest muscles and diaphragm have to work hard to open the way of air and pull the air into the lungs [4]. It is responsible for shallow breath and sometimes individuals can experience stopping breathing during sleep. After that start the breath for a long gap, loud gasp, body jerk, and snort. This disease is not able to provide the individual with good or proper sleep which is why people may feel tired and lazy the entire day. These problems also occur in children. In this context, it can be said it can be risky for individuals who have diabetes, high blood pressure, are overweight, have a thick or large neck, have smaller air passage of nose, throat, and mouth, and have large tongues. Apart from those who have too many tissues in the back of the throat. It is responsible for blocking the airways. Polysomnography is the process that can provide the solution to all factors.

The Role of polysomnography in sleep disorder
In sleep disorder, polysomnography plays a significant role and it has some stages to diagnose the issues and process of treatment. This is a painless and noninvasive test and it has some common skin irritation. It happens for adhesive use of the sensors that are attached to the skin. The medical professionals advised the patients to avoid smoke and intake of alcohol and caffeine during the evening or afternoon before polysomnography. Caffeine and alcohol can change the patterns of sleep and they may raise the symptoms of sleep disorders [5]. This test can monitor the entire sleep and its stages overnight. Individuals can go sleep center and also take the treatment at home. For this test, maintaining a regular bedtime routine is most required and the professional place the sensor on the body and turns on the machine as per the instruction and instructions. While polysomnography is done in the room and it requires to quiet and dark during the test. Accordingly during the test individuals can not share their room with rooms with others [6]. The sleeping area needs to lows lights video camera that helps top polysomnography technologist monitors the entire situation and recognizes the movements of the patients.

Figure 2 : Reason of obstructive sleep apnoea
(Source : 7)

This machine has its own audio system that medical professionals can interact with the patients. The technicians are placed the sensor on the temples, scalp, legs, and chest using mild adhesive. These sensors are connected with wires to a special computer system. These wires are too long that a patient can move around the bed and a small clip is also attached to the finger that can monitor the oxygen level of blood. Polysomnography can able to monitor eye movement, brain waves, heart rate, body position, abdominal and chest movement, and limb movement [7]. On the other hand, this process also monitors snoring and other sounds that can make asleep the patient.

After the end the entire process it provides the detailed information about the patterns of sleep such as

- Breathing and heart rate changes and changes the level in oxygen that are not normal durings sleep and it may sleep apnoea.
- Unusual movement and high blood pressure can be signs of sleep apnoea.
- Changes in brain waves and movements of eyes also may a sign of Obstructive sleep apnoea

This kind of data is generally gathered by polysomnography and it plays a major role to recognize the issues through the chart of sleep cycles and stages. After analyzing the result, medical professionals suggest medications and preparations based on the sleep history and symptoms that help to provide recovery and solutions [8]. This evaluation involves the entire function of the body during sleep and this test helps to detect sleep apnea. At last, it can be said that PSG is the diagnostic test, and it has a connection with the clinical history and other diagnostic tests including sleep-related disorders, narcolepsy, and certain parasomnias. The gold standard OSA diagnosis is also attended polysomnography that involves the seven collections and more channels of data including electrooculogram and electroencephalogram for electromyogram, sleep staging, respiratory channels, and electrocardiogram.

Method

This study has used some important resources such as PubMed, MEDLINE, Amed, and journals, newspapers, and articles to extract authentic data for the research study. This research paper has chosen a secondary qualitative research process to make progress in the research work. The secondary qualitative method is a much easier method than other kinds of data extraction and analysis processes [9]. It gives major opportunities to know the different kinds of knowledge on polysomnography. Apart from this, the research study also helps to gather information on sleep apnoea and its diagnosis and treatment procedures. There is some crucial reason for selecting a secondary qualitative method for this study. This process has the ability to provide lots of information and a large number of data sets that support the entire research process and its progress.

On the other hand, it can provide a framework that helps to give a strong and constructive structure to the data. Accordingly, it also helps to make the perfect patterns of the data. The secondary qualitative method has some big advantages such as it assists to manage the time as per the requirement of research work and also helps to get the relevant and exact data from a large set of data. This is an opportunity that helps to get the adjacent outcomes from research work [10]. This method does not require more technical knowledge and a mechanism to extract information. Minimum technical knowledge and experience are enough to get the relevant information for future study. One of the other reasons for selecting secondary qualitative is, this process uses the existing research information and also helps to make the difference between past and present conditions. Through this process of research. It helps to provide knowledge about sleep apnoea. From this study, it has been seen that this is a serious disorder and is also responsible for hampering the lifestyle of the individual. It has different kinds of symptoms and polysomnography is the process that can measure and record the stages of sleep and also record the waves and frequencies of the brain [11]. On the other hand, the primary thing is the observation that is able to provide more relevant and accurate data and

information for the study. This process does to need pay money for data and data is always available. Accordingly, it can be said that the secondary qualitative process is budget and time friendly and also provides the raw data in systematic sequences. All the factors are enough to select a secondary qualitative research process for this study.

Discussion

From this abovementioned study it can be observed that polysomnography is the sleep study that generally uses for recognizing the disorder that is related to sleep. It also can record the activity of the brain and also measure the frequencies. On the other hand, this process also records the waves of the brain and measures the oxygen level of the blood [12]. This process is connected with patients who are suffering from sleep-related issues and difficulties in sleep. This test is the process that can recognize the issues through the various sensors. The medical professionals placed the sensor on the scalp, chest, legs are other various parts of the body. It records each and every situation, frequency, and activity and this helps to get the outcomes from the patient body [13]. Accordingly, there is a small clip that helps to measure the oxygen level in the body. At that time patients are not able to share their room with others and the room is requires dark and quiet which helps the technicians to detect the body position, sounds, and snoring that make asleep the patients.

Polysomnography also measures all essential things that assist to treat a person carefully and also monitor a person. From this study, it has been recognized that this method plays a major and essential role to detect the disease. There are various kinds of devices that can detect the frequencies and also record the essential measurement. This test has few side effects such as skin irritation due to sensor attachment with the skin. These devices consist of a nose piece that is able to provide a gentle air stream that can force to enhance breathing [14]. CPAP machine also delivers constant air that helps to open the air passage during sleep. Bipap is a special type of machine that delivers a high flow of air in breathing and a low flow in exhaling. All the factors help to develop the position of air and nasal way and also improve the breathing system.

Conclusion

The above study is based on polysomnography and its impact on obstructive sleep apnoea. From this study, it has been seen that this is a serious kind of disorder that can disrupt the sleep of a person. On the other hand, this disease also destroys the well-being and quality of life of a person. There are many people who are facing this kind of problem and it hampers their work as well as their activity. They feel sleepy, and tired in day time which helps to hampers their professional and personal life also. This study has discussed the polysomnography process and which is an innovative technological process. It uses a monitor, and sensor to detect the issues. It has been seen that medical professionals and technicians place the sensors on the body of patients and also attached it to a computer and monitor the whole thing throughout the night.

The sensor are connected to the computer by a long wire and the patient can easily move around the bed. After finishing the test, professionals extract the report and provide the possible solution to the patient. This study has also shed light on the entire treatment process and diagnosis process of polysomnography. on the other hand, this study has discussed elaborately the concept of sleep apnoea and polysomnography. This study used the secondary qualitative method to collect the data and analyze the data. This method helps to create a difference between the various process of treatment and also identify the measurement of values. This process of analysis and data extraction provides the possibility to give value and effort to the study. At last, it can be said that polysomnography can provides the individual with a better lifestyle and also release them from their sleep difficulties can improve their daily lifestyle.

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