

ELECTRONIC INSTRUMENTS HELP IN DIAGNOSIS OF SLEEP DISORDERS

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ABSTRACT

This paper helps the reader to have quality knowledge about sleep disorder and its types also about EEG signal how it helps in the treatment of sleep disorder. Sleep disorders may be one of the reasons for disturbed sleep. Disturbed sleep include many inabilities such as to fall asleep, to go back to sleep and frequent waking up during the night. Sleep disorders can be classified under primary and secondary sleep disorders. Sleep apnea, restless legs syndrome, insomnia, periodic limb movement disorder, narcolepsy, and adequate sleep hygiene includes primary sleep disorder. Whereas snoring and eating sleep order includes secondary sleep disorder. By the improved recognition of sleep disorders, there is increase in the variety of treatments available.

KEYWORDS: Electroencephalogram (EEG), Sleep Disorder And Its Types, Treatment Techniques.

I. INTRODUCTION

Sleep disorders are described by unusual sleep patterns that arbitrate with forcible, genial, and aroused functioning. Tensity or uneasiness can cause a dangerous night without sleep, as mixture of other problem. This is normal and ordinarily temporary, because of strain or other external factors. If sleep problems are occurring on regular basis and step in with our daily routine life, this denotation leads to excruciation from a sleep disorder. Sleep disorder incorporates sleep apnea (trashy snoring by obstructed airway), sleep walking, and narcolepsy (falling asleep automatically). Restless leg syndrome and bruxism (abrasion of the teeth during sleeping) are circumstance that also may lead to sleep disorders. Other familiar sleep disorders consists of Parasomnia, Circadian rhythm sleep disorders, Dysomnias, psychiatric disorder, night terror disorder, sleep walking, periodic limb movement, sleep paralysis. Sleepiness is caused by sleep disorder. The deprivation of feature sleep can have a worse impact on vitality, emotional build, and health. Feel rough and sleepy headed, have a large difficulty in staying asleep, sitting quite or feel very exhausted while driving, have trouble in concentrating, to feel that a nap is required are indications of sleep disorders. Every sleep disorder is unparallel and few imply compounding of various treatments, including medical and behavioral changes. Therapies are the treatments, if diagnosed with insomnia, restless legs syndrome, or sleep apnea. Non pharmacological treatments involve all of the several options that do not show the involvement of the use of prescription or non-prescription drugs. For snoring, nasal strips are used, for sleep apnea positional therapy is used. The use of behavioral therapy, surgery, medical equipments, and other option may be engaged. Prescription or non-prescription drugs are used in Pharmacological treatments. By diagnosing the nature of sleep disorder, sedatives can be prescribed to the sufferer, if the case is insomnia or if the case is narcolepsy or sleep apnea, stimulants are prescribed to the

sufferer. The use of other medications can also be seen which aimed the particular implicit cause of the disorder. A prescription is required by these agents. Recommendation of counter medication is seen, by the presence of melatonin in the treatment of jet lag and circadian rhythm. Therapies impacted by the demeanor related with sleep can be effectual. These may let in: cognitive therapy, relaxation techniques, stimulus control, cognitive behavioral therapy (CBT). Behavioral therapies may do wonders in treating parasomnia, bedwetting, insomnia, and other sleep disorders. There are various number of durable medical equipment selection, which leads to medical device, used again and again for treatment of medical condition. The most classifiable of these selection may be continuous pressure airway pressure (CPAP) for the diagnosis of sleep apnea. Some other related treatment is bi level or Bi-PAP which gives two different pressure, one pressure is with inhalation and one pressure with exhalation. Dentists may offer oral appliance and mandibular for the treatment of sleep apnea. Light box therapy may be used for the treatment of an individual suffering from circadian rhythm disorder and seasonal affective disorder (SAD). There are many other tests such as full night polysomnography, split night polysomnography, oximetry used for the treatment for sleep disorders.

II. SLEEP DISORDERS ITS TYPES AND CAUSES

Sleep disorders can be defined as a group of syndromes marked by disruption in the patient's quantity of sleep, caliber or timing of sleep, or in deportment or physiological situations related with sleep. There are mainly 70 various sleep disorders. To testify for the sleep order diagnosis, persistent problem should be there, cause the patient makeable perception strain, and relates with his/her sociable or occupancy functioning. Sleep disorders are determined on what causes them. Primary sleep disorders are distinctively different from those which are not caused from medical conditions, prescribed medication, substance abuse or mental disorders. Dyssomnias and parasomnias are the two major classification of primary sleep disorder. There are many other types of sleep disorders such as:

2.1 Sleep Apnea

Sleep apnea is usual sleep disorder in which breathing stops for limited time because of upper airways blockage. This leads the sufferer to fall asleep every hour pausing in breathe which causes interrupted sleep. While other suffers find themselves in exhausted, depressed and in irritable condition and also they don't remember these frequent stages of falling asleep. Sleep apnea is dangerous and serious sleep disorder, any one suffering from this might urgently seek a doctor. Successful treatment of sleep apnea can be done by Continuous Positive Airway (CPAP), a device which is masked like is used which delivers stream of air when the sufferer has fallen asleep. By reducing weight, sleeping on relevant side and by elevating the head of the bed helps in moderate sleep apnea.

2.2 Cause of Sleep Apnea

Loud snoring, frequent pauses in breathe, choking and snorting during sleep causes sleep apnea. No matter how much time has spent by the sufferer in the bed still he/she feels lethargic and exhausted. Some pain in chest, headaches, dry throat, nasal blockage and shortness of breath are also some causes of sleep apnea.

2.3 Restless Legs Syndrome (RLS)

Restless legs syndrome (RLS) is a type of sleep disorder which is caused by irresistible movement of legs and arms of the sufferer. This feeling occurs when the sufferer is lying down or in resting position and is mainly because of unusual, creepy or aching sensations.

2.4 Cause of Restless Legs Syndrome (RLS)

Unusual sensations within the legs, feel like to move them refers to the cause of restless legs syndrome. These sensations have different intensities, intensity of moving leg gets painful or worse at night and it gets slow by taking rest. This uncomfortable feeling or sensation gets a better outlook when sufferer tries to move or stretch legs. Continuous jerking or cramping of the legs during sleep.

2.5 Narcolepsy

This sleep disorder includes exuberant, unmanageable sleepiness during daytime. A function of brain that controls sleeping and walking, called dysfunction causes narcolepsy. If somebody is suffering from narcolepsy might have faced "sleep attacks" while driving, working or talking.

2.6 Cause Of Narcolepsy

Usual symptoms are hearing and seeing thing when the suspect is about to dream before fallen asleep. When the suspect is laughing, angry or going through strong emotions suddenly starts feeling weak or muscles starts losing control is another symptom of narcolepsy. Sudden feeling of paralysis, having intense dream or not proper movement after waking up is some other symptoms of narcolepsy.

2.7 Delayed Sleep Phase Disorder

Biological clock is affected or disturbed. 24 hours cycle of sleep of wakefulness and sleep is delayed or sleep routine is completely affected by delayed sleep phase disorder. And hence as comparison to normal sleep routine, the sufferer sleeps at late night and wake up late in the morning. Let's consider an example, suppose anybody did not feel sleepy till 4.a.m., and after that he/she feels sleepy and further more wants to sleep a lot till the noon. This sign leads to delayed sleep phase disorder. All these characteristics of delayed sleep disorder make the routine difficult. The sufferers find themselves inattentive in morning classes, finding difficulty in 9-to-5 job. The point to be noticed is sleeping problem is caused by staying up late. The people suffering from delayed sleep phase disorder find themselves unable to get to sleep early, 2 to 6 a.m., is the noticeable time. The sufferer cannot get up early at normal times. A person suffering from this disorder cannot keep a regular schedule. In teenagers this type of disorder is very common. Chronotherapy can be the treatment for delayed sleep disorder.

2.8 Cause Of Delayed Phase Disorder

Main cause of this disorder is seen in teenagers and that is sleeping late in night and waking up late in the morning. Teenagers are mainly affected by this type of disorder.

2.9 Obstructive Apnea

This type of sleep disorder is life-threatening or dangerous sleep disorder in which during sleep, breathing several times repeatedly starts and stop. By the relaxation and blockage of throat muscle obstructive apnea occurs.

2.10 Cause Of Obstructive Apnea

Snoring is most noticeable sign of obstructive apnea affecting adults and middle aged people and who are overweight.

2.11 Central Apnea

Central apnea shows glimpse of obstructive apnea, in which repeatedly start and stop of breathing is there. Due to breathing central apnea occurs. This situation is slightly different from obstructive apnea in which breathing cannot be done due to upper airway obstruction.

2.12 Cause Of Central Apnea

As a result of stroke and heart failure, central apnea occurs.

2.13 Mixed Apnea

Combination of obstructive and sleep apnea is termed as mixed apnea. Mixed apnea is normally found in young children or infants, who have breathing in abnormal control.

2.14 Cause Of Mixed Apnea

As compare to normal sleep, obese children or those suffering from dangerous apnea have total sleep time longer, behavioral usual ties, effort in breathing and snoring are main causes of sleep apnea.

III. DIAGNOSIS TEST BY ELECTRONICS INSTUMENTS & TREATMENT

Treatment objective reduces sleepiness and improve quality of life and also decreases cardiovascular consequences. Following test can be used for the treatment for sleep disorder. In laboratory, full night polysomnography, split night tests and oximetry. Sleeping pills is not the proper diagnose for insomnia. Sleeping pills may make insomnia worse if taken in longer run. In normal conditions, for diagnosing short term situations sleep medication and sleeping pills can be used at their best ways, such as recovering or traveling across many zones from medical procedure. To avoid dependence and tolerance on medication, it should be used according to the need instead on daily basis. There are two main categories of treatment, named pharmacological and non-pharmacological treatments. Non-pharmacological treatments do not include prescribed and non-prescribed drugs. While pharmacological treatment includes prescribed and non-prescribed drugs.

FULL NIGHT POLYSOMNOGRAPHY TEST: Full night laboratory consists of continuous recordings of several number of multiple physiologic parameter related to wakefulness and sleep. Patients who have high probability but a low apnea index night to night variation may exist. Equipment problem can be solved easily in this test and availability of full set of variable is there. Cost and accessibility are the two cons of this test and more importantly patients sleep away from home.

OXIMETRY: Measuring of concentration of oxygen in blood using an oximeter is done in this test. A dielectric device is specially used for this purpose. In this test equipments cannot be adjusted by the technician. This test is potentially less expensive and also patients sleep away from home.

IV. CONCLUSION

After going through detailed study of sleep disorders, this paper is helpful for the readers to have brief knowledge about sleep disorders, its types and treatments. Role EEG signal can be marked as good sign for the detection of sleep disorders. Deep study of treatment test shows different method to diagnose various types of sleep disorders. In addition to the future work emphasis should be on finding more treatments for sleep disorders. One more point can be kept as priority that new treatments should be easy and smoothly implemented on the patients. It can concluded that new methods of treatment for the diagnose of sleep disorder and various other methods can be listed for the future work. One thing important is EEG signal which will be as the priority tool in new methods of treatments for the sleep disorders.

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