

RAPID EYE MOVEMENT SLEEP BEHAVIOR DISORDER

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ABSTRACT

This article will allow readers to know that sleep is an important phenomenon. Lack of sleep may result into a disease known as Rapid Eye Movement Sleep Behavior Disorder. In a normal person, dreaming is an activity that is observed in mind and his body is at rest. A RBD patient starts acting out his dreams by moving his hands and legs, screaming, talking, walking, hitting his bed partner and sometimes even jumping out of bed. In this article I will also discuss various stages of sleep and RBD symptoms and its causes.

Keywords: Stages Of Sleep, Non-Rapid Eye Movement Sleep, REM Sleep, Rapid Eye Movement Sleep Behavior Disorder, RBD Causes, Symptoms of RBD, Risk Factor, Diagnosis, Treatment

I INTRODUCTION

Sleep is a universal activity that is observed by every species on this earth. Sleep is a natural phenomenon that takes almost one-third of human life. It is an activity that forces every person to leave state of consciousness and navigate between worlds of dreams and deep sleep every night. It is an anabolic state where body repairs and regenerates body tissues, build up the bones and muscles, and strengthen immune system. A sleeping person has eyes closed, lying down, breathes slowly with relaxed muscle and is generally lying still. He is unconscious of the things going around. Sleeping stage is different from comatose and hibernation because a sleepy person can be woken up by loud sound, touches, with bright light etc.

1.1 Stages of Sleep

When a person is awake, he is in stage 0 i.e. his eyes are open, responsive to external stimuli, and can hold intelligible conversation. Technically, the brain wave pattern here is classified by two types of waves. They are-

- **Beta Wave:** These are associated with wakefulness. These waves have highest frequency and lowest amplitude. These are not synchronized in their pattern. This is due to the fact that various cognitive, sensory, and motor activities affect our mental status.

- **Alpha Wave** :When we are resting but still awake, our brain waves starts increasing in amplitude and decreasing in frequency. This makes them a bit synchronous.

According to various sleep studies there are mainly two stages of sleep. They are classified as

- Non rapid eye movement sleep
- Rapid eye movement sleep

1.2 Non Rapid Eye Movement Sleep

NREM sleep is a sleep in which no eye movement is observed. NREM sleep is divided into four categories. They are:

- **Stage I**

It is a stage of light sleep where a person sleep cycle swings between state of wakefulness and sleep. A person's eyes are closed and he can be easily awakened. This stage is characterized by theta waves with are much slower and higher in amplitude than above two waves. This phase may last for 5 to 10 minutes.

- **Stage II**

It is starting stage of actual sleep. This is light sleep. Heart rate slows and the body temperature drops down and the human body is getting ready for deep sleep. It lasts for approximately 20 minutes. The brain begins to produce bursts of rapid, rhythmic brain wave activity known as sleep spindles.

- **Stage III**

Deep, slow brain waves known as delta waves begin to emerge during stage 3 sleep. This stage is sometimes referred to as delta sleep because of the slow brain waves known as delta waves that occur during this time. During this stage, people become less responsive and noises and activity in the environment may fail to generate a response. It also acts as a transitional period between light sleep and a very deep sleep. Bed-wetting and sleepwalking are most likely to occur at the end of this stage of sleep.

- **Stage IV**

This is the deep sleep stage. It's harder to rouse you during this stage, and if someone woke you up, you would feel disoriented for a few minutes. During the deep stages of NREM sleep, the body repairs and regrows tissues, builds bone and muscle, and strengthens the immune system.

1.3 REM Sleep

REM sleep happens 90 minutes after you fall asleep. The first period of REM typically lasts 10 minutes. Each of your later REM stages gets longer, and the final one may last up to an hour. The heart rate and breathing quickens.

One can experience intense dreams during REM sleep, since the brain is more active. Babies can spend up to 50% of their sleep in the REM stage, compared to only about 20% for adults.

1.4 Rapid Eye Movement Sleep Behavior Disorder

Dreaming is purely a “mental” activity that is experienced in the mind while the body is at rest. But people who suffer from rem behavior disorder (RBD) starts acting out their dreams. They physically move their limbs or even get up and engage in activities associated with waking. Persons with RBD lack this muscle paralysis, which permits them to act out their dreams in dramatic and violent manner while they are in the REM stage of sleep. Sometimes they starts talking, twitching and jerking during dreaming for years before they fully act out their REM dreams.

II RBD CAUSES

Rapid eye movement behavior disorder (RBD) is seen when there is a loss of normal voluntary muscles during sleep. This results in motor behavior in response to dream content. Adverse reactions to certain drugs or drug withdrawal are also the cause of RBD. It is most common in elderly person. People with neurodegenerative disorders like Parkinson disease, multiple system atrophy and Lewy Body Dementia are also at higher risk to suffer from RBD .

According to different causes, RBD is also categorized as:

2.1 Idiopathic RBD Causes

When a person's sleep structure appears to be normal but he experiences increase in the density of REM sleep. Also an increase in the percentage of slow wave sleep is observed .then he is suffering from idiopathic RBD. This category of RBD is genetic.

2.2 Symptomatic RBD Causes

Symptomatic RBD is common in people suffering from any other neurodegenerative disease. Research shows that About 15% of Parkinson's patients also have RBD, About 70% of multiple system atrophy patients also have RBD, About 85% of Lewy Body Dementia patients also have RBD. Other neurodegenerative associations include Shy-Drager Syndrome, Olivo-Ponto-cerebellar atrophy, multiple sclerosis, vascular Encephalopathy, Tourette's, and Guillain-Barre syndrome. damage of neural circuits that govern REM sleep is also observed.

2.3 Physiological Causes

Following physiological changes are observed in RBD patients as compared to non-RBD patients

- ✓ Central nervous system dysfunction
- ✓ Abnormal cortical activity
- ✓ Low beta waves in the occipital lobe as well as increased theta waves in the frontal and occipital lobes are observed during REM sleep.
- ✓ Frontal lobe and pons dysfunctions and lower blood flow in these portions of brain.
Brainstem

III SYMPTOMS OF RBD

- Kicking
- Shouting
- Jumping
- Grabbing
- Twitching and jerking
- Leaping out of bed
- Hitting and punching
- Performing action
- Self -injury or injury to bed partner

IV RISK FACTOR

Men are more prone to the rapid eye movement disorder than women. This disorder can be seen at any age group but it is more common after age of 50-60. Persons with rapid eye movement disorder are also at a higher risk of suffering from neurological disorders like

- Parkinson's disease (a brain disease leading to tremors. A person also suffers difficulty while walking and moving)
- Multiple system atrophy (resembles Parkinson's disease but with more damage)
- Narcolepsy (sleep attacks during daytime are experienced)
- Periodic limb movement disorder (feeling of cramping or jerking the limbs is experienced during sleep)
- Sleep apnea (difficulty in breathing during sleep)

V DIAGNOSIS

RBD gets worse over time and is dangerous to self as well as to bed partners. RBD can be diagnosed by performing sleep studies like polysomnography at sleep centers. In polysomnography, a Person is extensively monitored overnight. Readings of sleep, brain activity, muscle activity etc. are taken to distinguish a person suffering from sleep disorder. These studies reveal the muscle paralysis during REM sleep.

Now doctors are also diagnosing this disease by conducting clinical interviews. In these interviews, an individual is asked some questions about his sleeping schedule, sleeping habits, alcohol intakes, medications etc. Doctors even believe in interviewing the bed partners to diagnose the disease in a better way.

VI TREATMENT

RBD can be treated with proper medication. Clonazepam, Melatonin, levodopa, Pramipexole are some of the medicines present till date for treatment of RBD.

VII PRECAUTIONS

Following precautions should be taken with the RBD patient for his as well as bed partner's betterment.

- Secured sleep environment
- Removal of dangerous objects from bedroom like night lamp, flower pot etc.
- Maintaining a normal total sleep schedule
- Avoid sleep deprivation
- Treatment of any other sleep disorder that increases chances of RBD
- Scheduled monitoring of any other neurological symptoms.
- Avoid alcohol, drugs, certain medications etc.

VIII CONCLUSION

Rapid eye movement sleep behavior disorder is one of the serious diseases that people often suffer from. People suffering from RBD may cause harm to themselves as well as their bed partners in very serious way. It needs to be diagnosing at proper age so that it can properly treated. It is also one of a great field of research for both medical as well as engineering student.

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