

Sleep Paralysis – An Unusual Neurologic Phenomenon

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Abstract: Sleep paralysis, an unusual neurologic phenomenon, is a condition in which the victim face inability to move his/her limbs, to speak and even to open his/her eyes on awakening or more rarely when falling asleep. The individual's senses and awareness are intact during this time, but they may feel as if there is pressure on them, or as if they are choking [1]. The paralysis always disappears either suddenly or after an intense effort by the patient to break the paralysis state. Also some sensory stimulation, being touched or spoken to, helps them to awake completely. The duration of this condition last from few seconds to few minutes. The incidence of this common condition is 5-62%. Exact reason behind this condition is not fully understood even though so many researchers have already tried to uncovering the mechanisms behind this condition. This condition is most likely to occur during adolescence. Stress, unhealthy sleeping habits and even panic disorders may trigger this condition. In sleep paralysis, the person woke up before their brain stem, which stops their muscles from moving, realizes it's awake. As a result, it continues sending neurotransmitters that make the muscles to freeze [2]. However, the proper mechanism behind this condition is not fully known. Although it is not harmful, at times severe state of sleep paralysis may disturb the normal sleeping pattern of a person. Hence it is advisable to meet a doctor in such kinds of situations when it's leads to a problem for the affected victim. It can be prevented with good sleep hygiene and by treating underlying causes.

Keywords: *Sleep paralysis*

1. INTRODUCTION

Sleep paralysis is one of the many conditions of which visual hallucinations can be a part but has received relatively little attention. It can be associated with other dramatic symptoms of a

psychotic nature likely to cause diagnostic uncertainty. In this condition, the victim experience inability to move or to talk during the transitional periods between sleep and wakefulness: at sleep onset or upon awakening [3].

Sleep paralysis is a common symptom of the neurological disorder narcolepsy, which is characterized by uncontrollable sleepiness throughout the waking day. However, in many people sleep paralysis occur independently. So, to distinguish between narcolepsy-related episodes and independently occurring sleep paralysis, specialists usually refer to the latter as "isolated sleep paralysis." Recurrent isolated sleep paralysis often starts during adolescent period, and around 28.3 percent of students apparently experience it. Recurrent isolated sleep paralysis is a parasomnia [4].

A sleep paralysis involves undesired events that come along with sleep. Even though unable to move arms and legs, body, and head the Patient can still able to breathe normally. Patient remains fully aware of what is happening. After an episode, last for few seconds to few minutes, it usually ends on its own. It may also end when someone touches you or speaks to the patient. Making an intense effort to move can also end an episode.

Sleep paralysis may occur only once in your life. It may also happen many times in a year, accompanied by terrifying hallucinations. Sleep paralysis, typically fall into three distinct categories: Firstly, A sensed presence, or intruder hallucinations, in which the person feels the presence of an evil, threatening individual, sounds of doorknobs opening, shuffling footsteps or a threatening presence in the room. In the second type, incubus hallucinations, the person might feel someone or something pressing down uncomfortably, even painfully, on their chest or abdomen, or trying to choke them. Person also might feel that they are sexually assaulted by a malevolent being and difficulty in breathing. Lastly in the third category, vestibular-motor hallucinations, during which the individual thinks that they are floating, flying, falling, hovering over one's body or moving- these may also sometimes include out-of-body experiences, in which a person thinks that their spirit or mind has left

their body and is moving and observing events from above[5].

The most common hallucination linked to sleep paralysis is the 'sensed presence' of a sinister figure. Loud Proud in his book, *Dark Intrusions*, have offered detailed accounts of years of uncanny nightly encounters. In his book he describe about the experiences of different persons during sleep paralysis like "someone knelt on victim's chest so that it felt as if he was being choked out.", night-time assailant that takes pleasure in tormenting the victim in myriad ways, a strange, shadowy man coming up victim's stairs and into his bedroom. Although usually people with sleep paralysis report experiencing terrifying hallucinations, a few has reported their happy experiences too . They consider it as a state of bliss that makes them look forward to these episodes. A study that was conducted by James Allan Cheyne, from the University of Waterloo in Ontario, Canada, suggests that the people who most often describe experiencing positive feelings and sensations during an episode of sleep paralysis are those who are prone to vestibular-motor hallucinations. "These hallucinations were found to involve feelings of floating and (out-of-body experiences), which are associated with feelings of bliss rather than fear." [6].

Sleep paralysis is not life-threatening. Even though it's not harmful mostly, it can be very frightening at times and it may leads to anxiety disorder. It should pass in a few seconds or minutes. Many people have sleep paralysis once or twice in their life, while others experience it a few times a month or more regularly. It affects people of all ages and is most common in teenagers and young adults.

Sleep paralysis usually occurs at different times. If it occurs while you are falling asleep, it's called hypnagogic or predormital sleep paralysis. If it happens as you are waking up, it's called hypnopompic or postdormital sleep paralysis. Other very rare type is falling asleep suddenly during day time and disturbed sleep at night. The later one may disturb the client's normal sleeping habits.

2. HISTORY

The experience of sleep paralysis has been documented for centuries. This most unsettling experience was first clearly documented in a medical treatise in the 17th century, by Dutch physician Isbrand Van Diembroeck, who wrote about the case of a strong healthy woman "50 years of age, yet who complained of mysterious

experiences at night, where it was referred to as, 'Incubus or the Night-Mare '. In 1977 it was discovered , in various South East Asian communities, in more than 100 previously healthy people had died mysteriously in their sleep. The individuals affected were dying at a rate of 92/100,000 from Sudden Unexplained Nocturnal Death Syndrome. No underlying cause was ever found. Since then it has reported various parts of the world. And also, Van Diembroeck has written her experience when she was composing her self to sleep that she believed the devil lay upon her and held her down, sometimes that she was choked by a great dog or thief lying upon her breath, so that she could hardly speak or breathe[7].

3. DEFINITION

Sleep paralysis (SP) is a transient and generally benign phenomenon, occurring at sleep onset or upon awakening, represents a psycho-physiological state characterized simultaneously by qualities of both sleep and wakefulness, wherein the experiencer can open her eyes, can be aware of her physical environment but is unable to move and may start seeing, hearing, feeling or sensing something (Hishikawa & Kaneko, 1965).

Researchers define it as "a common, generally benign, parasomnia characterized by brief episodes of inability to move or speak combined with waking consciousness."

4. INCIDENCE

As per the study report 7.6 percent of the general population has sleep paralysis. People with mental disorders such as anxiety and depression are more likely to experience sleep paralysis. 31.9 percent of those with mental disorders experienced Sleep paralysis as per the recent findings. It often starts during adolescence, and it can become frequent during the 20s and 30s. Recurrent isolated sleep paralysis often starts in adolescence, and around 28.3 percent of students apparently experience sleep paralysis. This common condition is often first noticed in the teenage period. But men and women of any age can have it[8].

5. RISK FACTORS & CAUSES

Although a fair amount of studies has been conducted in this respect, still it's remain largely misterious that who is the most vulnerable person for this sleep disorder, what causes sleep paralysis and what are the exact risk factors . However based on the research findings, Sleep paralysis is more common among children and adults

but higher risk group include people suffering with stress, anxiety disorders, bipolar disorders, depression, post-traumatic stress disorders, panic disorder and depression. Sleep paralysis may run in families. Other factors that may be linked to sleep paralysis include sleep disorder, insomnia, irregular sleeping patterns in case of shift work or jet lag, sleeping on the back, sleep problems such as narcolepsy (a long-term condition that causes a person to suddenly fall asleep at inappropriate times), night time leg cramps, obstructive sleep apnea .

Person who take certain medication for ADHD is also prone to get sleep paralysis. Sleep paralysis is also highly linked with family history (inherited gene) . some of the less causes: Substance abuse, patient's with migraines, hypertension, poor sleep hygiene , "Specifically, excessively short (fewer than 6 hours) or long (over 9 hours) sleep duration and napping, especially long naps (over 2 hours), were associated with increased odds of sleep paralysis.", "Long self-reported sleep latency (over 30 minutes).

Also, studies has shown that Individuals who have experienced abuse in early life are also more exposed to sleep paralysis.

6. PATHOPHYSIOLOGY OF SLEEP PARALYSIS

The exact mechanism behind the sleep paralysis is not clearly known. However, there are so many research studies has been carried out to find out the mechanism. During sleep paralysis our brains or parts of our brains become awake and conscious, but the rest of the body is still immobilized. At the same time, during sleep paralysis, many people experience dream visions and sensations as though they were real and the fact that they are, in fact, partly awake and conscious blurs the line between reality and dreams.

During sleep, your body alternates between REM (rapid eye movement) and NREM (non-rapid eye movement) sleep. One cycle of REM and NREM sleep lasts about 90 minutes. NREM sleep occurs firstly and takes up to 75% of overall sleeping time of a normal person. During NREM sleep, body relaxes and restores itself. At the end of NREM, sleep shifts to REM. Eyes move quickly and dreams occur, but the rest of your body remains very relaxed during this phase. During REM sleep the CNS is intensely active, but the skeletal motor system is paradoxically forced into a state of muscle paralysis. The mechanisms that trigger REM sleep paralysis are a matter of intense debate. Two competing theories argue that it is caused by either active inhibition or reduced excitation of somatic moto-neuron activity. As

per the study on rats, both the transmitter and receptor mechanisms function to silence skeletal muscles during REM sleep. Result of the study showed that a powerful GABA and glycine drive triggers REM paralysis by switching off motoneuron activity. This drive inhibits motoneurons by targeting both metabotropic GABAB and ionotropic GABAA /glycine receptors. REM paralysis is only reversed when motoneurons are cut off from GABAB , GABAA and glycine receptor-mediated inhibition. Neither metabotropic nor ionotropic receptor mechanisms alone are sufficient for generating REM paralysis. These results demonstrate that multiple receptor mechanisms trigger REM sleep paralysis. One other popular theory posits that this temporary state of paralysis is meant to prevent us from hurting ourselves, perhaps in automatic response to some violent dream. If you become aware before the REM cycle has finished, you may notice that you cannot move or speak[8].

7. SYMPTOMS

Those affected with sleep paralysis are often unable to move their bodies or speak immediately after waking up and also, they are completely aware of the surroundings at the same time. This can last one to two minutes, People suffer from sleep paralysis, usually experiences different feelings like weight on their chest , a choking feeling, floating , falling, feeling as if death is approaching . People have also, reported seeing ghosts, demons and have a sensation of someone else in the room, and some one is walking through your stairs while experiencing paralysis. This was often due to hallucinations, which are a common symptom during sleep paralysis because the brain is still in a dream state. Other symptoms include difficult to take deep breaths, as if your chest is being crushed or restricted ,be able to move your eyes (some people can open their eyes but others find it difficult). Mostly, the victim became unsettled and anxious about going to sleep again after an episode of sleep paralysis at the same time. Other rare symptoms include sweating, having headaches, muscle pains, and paranoia. Everyday non-threatening sounds, sensations, and other stimuli that the brain normally ignores become disproportionately significant[9].

8. DIAGNOSTIC MEASURES

If the person experience sleep paralysis regularly, interfering with your sleeping pattern, severe anxiety

about your symptoms or very severe symptoms (symptoms keep you up during the night), he/she can consult a neurologist. Usually doctors collect the information regarding a detailed health history, symptoms that keep the person up during night. overnight sleep studies or daytime nap studies helps to find out any other sleep disorder if there is. Sleep paralysis is not normally considered a medical diagnosis, but if symptoms are of concern[10].

9. TREATMENT AND PREVENTION

Most people need no treatment for sleep paralysis. Prevention is the main focus as sleep paralysis is not considered as a diagnosis. Treating any underlying conditions such as narcolepsy may help if you are anxious or unable to sleep well. These treatments may include the following:

1. Improving sleep habits
2. Using antidepressant medication if it is prescribed to help regulate sleep cycles
3. Treating any mental health problems that may contribute to sleep paralysis

Improving sleep habits

There are so many strategies to improve the sleeping pattern like keeping bedtime and wake-up time consistent (even on holidays and weekends), ensuring a comfortable sleep environment, with suitable bedding and a clean, dark and cool bedroom, reducing light exposure in the evening and using night-lights for bathroom trips at night, getting good daylight exposure during waking hours, not working or studying in the bedroom, avoiding napping after 3.00 p.m. and for longer than 90 minutes, not eating a heavy evening meal, or eating within 2 hours of going to bed, not sleeping with the lights or television on, abstaining from evening alcohol or caffeine products, exercising daily(but not within 2 hours of bedtime), including a calming activity in the bedtime ritual, such as reading or listening to relaxing music, leaving phones and other devices outside the bedroom, putting electronics aside at least 1 hour before going to bed. Make sure to get enough sleep on a regular basis, avoid alcohol, nicotine and drugs all night, limit caffeine after 2 p.m. and keep electronics out of the bedroom, avoid eating big meals, smoking, or drinking alcohol or caffeine shortly before going to bed, trying not to fall asleep on on your back since this is a risk factor for this disorder, finally persisting in the attempt "to move extremities," such as

fingers or toes, during sleep paralysis also seems to help disrupt the experience[11].

Using antidepressant medication

Antidepressant, short course of antidepressant medication, such as clomipramine (Anafranil), may be prescribed in case of severe depression to stimulate the sleeping pattern.

Treating any mental health problems that may contribute to sleep paralysis

Finally, if you regularly experience sleep paralysis with "sensed presence" and if it usually disrupts your sleeping pattern, then it may be worth considering cognitive behavioral therapy. According to the authors of the *Consciousness and Cognition* study, there is a distinct "possibility that frightening sensed presence experiences may contribute to maintenance of an individual's negative social imagery biases." If that is the case, cognitive behavioral treatment of experiences could help to alleviate the general social imagery dysfunction, that may improve the overall situation.

Additional measures include : Understanding the physiology of sleep and the mechanism for sleep paralysis is an important step to overcoming it. Nobody actually knows how to stop sleep paralysis, but there are ways to make it less scary[12]. Simply knowing what's going on can help. Brain is creating an imaginary monster, making your brain pay attention to something else can cause the imaginary thing to cease to exist, or at least not be so scary. It has given positive results in many of the patients of Dr.Sharpless.

10. CONCLUSION

Sleep paralysis is a brief paralysis experienced when falling asleep or waking up. Although numerous study has been conducted on this area, still it is unclear about the exact reason of this disorder. As there is no definite management for this rare disease, preventing this illness by improving your sleeping habits or treating underline causes will be helpful to keep away sleep paralysis to an extent.

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