

Sleep paralysis: A brief clinical review

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Abstract

This brief clinical review summarizes the literature on sleep paralysis most relevant to clinicians. Sleep paralysis is a condition where the sufferer awakens to rapid eye movement sleep based atonia, combined with conscious awareness. This is a frightening event accompanied by vivid, waking dreams and hallucinations. Sleep paralysis occurring independent of narcolepsy and other medical conditions is termed isolated sleep paralysis. Though rare in clinical practice, the unusual nature of the condition and a lack of training during medical residency and graduate education leads to fewer cases being detected. This paper looks at the prevalence, risk factors, diagnosis and management of sleep paralysis. The management consists of both pharmacological and psychotherapeutic interventions that need clear guidelines, empirical support and larger randomized controlled trials.

Keywords: Sleep, Sleep paralysis, Isolated sleep paralysis.

Introduction

Sleep paralysis is a neurological condition, a rapid eye movement (R.E.M) sleep parasomnia. Sleep paralysis is characterized by a period of inability to perform voluntary movements at sleep onset (hypnagogic form) or upon awakening (hypnopompic form).¹ Alternatively, it is also described as a "brief accesses of inability to move one's limbs, to speak and even to open one's eyes on awakening (hypnopompic / postdormital sleep paralysis) or more rarely when falling asleep (hypnagogic / predormital sleep paralysis)".² During sleep paralysis, the movement of the limb, trunk, and head are typically not possible, however, eye and respiratory movements are intact. The person is well aware of the happenings around his / her immediate environment. Along with awareness of his / her state during paralysis, the patient also has no difficulty in the recall of the event. In fact, the patient completely remembers the event of sleep paralysis.³

The first mention in the scientific literature about sleep paralysis was in 1876 by Silas Mitchell.⁴ He reported cases of sleep paralysis (one with narcolepsy and one with cataplexy) in 2 healthy white male adults. Before the word sleep paralysis became the scientific diction, terms like "nocturnal hemiplegia," "nocturnal paralysis," and "sleep numbness" were used. The term "sleep paralysis" was introduced by S. Wilson around 1925.⁵ Several other terms have also been used such as "delayed psychomotor awakening," "cataplexy of awakening" and "post dormital chalastic fits".⁵

Sleep paralysis is reported across various part of the globe, making it a universal phenomenon. Most commonly seen in young healthy adults and psychiatric patients, sleep paralysis is also noted in the older population.

Research has documented the presence and prevalence of the phenomenon in over 100 cultures.⁶ Sleep paralysis has been explained in various folklores such as in Persian, Brazilian, African American, Caucasian, and other cultures.^{7,8} Several folklores suggest an explanation of sleep

paralysis based on paranormal phenomena such as witchcraft,⁹ demonic assault¹⁰ and space alien abduction.^{11,12} Mostly, feelings of fear and distress are associated with these episodes, though feelings of bliss are sometimes reported by individuals.¹³

Epidemiology and Prevalence

Sleep paralysis is an unusual condition through the lifetime prevalence noted in metanalytic reviews is approximately 8% in the general population. However, it is interesting to note that the prevalence is extremely variable in individual studies, ranging anywhere from as low as 2% to as high as 60%.¹⁴ In understanding the variability of prevalence, it is crucial to keep in mind that various factors play a role, different scales used for assessment and lack of consistency with the terminology being the two most important factors.¹⁵ Various authors have studied to understand if there are gender differences. However, the findings are inconclusive. There are no significant gender differences in the reported experience of sleep paralysis on a global level (individual studies have found slight variations, some found males to have a higher prevalence of sleep paralysis and others, females). Some cultural studies have also shown discrepant findings among the rural and urban population, with a higher prevalence of sleep paralysis in the urban population.¹⁶

Factors Associated with Sleep Paralysis

As a part of the phenomenon of sleep paralysis, there may be vivid and terrifying hallucinations in the hypnagogic or hypnopompic stages of sleep. Episodes are frequently associated with a variety of hallucinations, such as a sense of an evil presence (intruder hallucinations), the pressure felt on the chest (incubus hallucinations), and illusory feelings of movement (vestibular-motor (VM) hallucinations).¹⁷ In rare cases, sleep paralysis may be preceded by cataplexy- a sleep disorder characterized by partial or total loss of muscle control, often triggered by a strong emotion such as laughter or anger. The paralysis always disappears suddenly, either

spontaneously, after an intense effort by the patient to "break" the paralysis, or after some sensory stimulation, such as being touched or spoken to. The duration of the episode is usually a few seconds, but may sometimes last a few minutes. The only sequelae are either an occasional relapse into the paralyzed state if the patient does not stand and move about, or rarely, numbness and tingling of the extremities. The first episode of sleep paralysis is commonly accompanied with extreme anxiety or a panic state, which usually subsides with subsequent episodes as the patient finds that they are brief, painless and leave no significant residual symptoms.¹⁸

Sleep paralysis is a common symptom of narcolepsy. Narcolepsy is a neurological disorder, characterized by excessive daytime sleepiness, cataplexy (sudden, brief, bilateral losses of muscle tone in response to strong emotions such as laughter or anger)¹⁹ and disturbed sleeping patterns at night.²⁰ The term "isolated sleep paralysis" is preferred when sleep paralysis is present in the absence of a diagnosis of narcolepsy.⁶ Some authors also use the term "fearful isolated sleep paralysis" to indicate cases where episodes cause clinically significant fear and/or distress. When episodes of sleep paralysis occur repeatedly, the term "recurrent (fearful) isolated sleep paralysis" is used, however, there is no standard agreement on the frequency of episodes to classify for recurrent.²¹

Variables Linked to Sleep Paralysis

The causes of sleep paralysis are multifactorial. The reasons are related to disturbances in the R.E.M sleep, though specific reasons are not very clear. Some of the possible reasons cited are the inability to sleep, erratic sleeping patterns, narcolepsy and a family history of sleep paralysis.²²

There are several factors that are proposed as either to be linked with sleep paralysis or serve as risk factors for sleep paralysis. Drinking alcohol, smoking and engaging in substance use are not shown to be directly linked with or predict sleep paralysis though studies have shown that some individuals who consume alcohol may experience sleep paralysis (significantly more) as compared to those who do not.²³

Another factor that has been reported to be linked with the increased risk for sleep paralysis is stress and trauma. Researchers report that a history of child sexual abuse was found to be significantly related to the frequency of sleep paralysis episodes. Threatening factors and other traumas also appear to be related to sleep paralysis.²⁴ A familial association has also been one of the reported factors for sleep paralysis. One study used a twin modeling approach to disentangle genetic from environmental effects and there appeared to be moderate genetic influences (estimated at 53%) on variation in the presence of sleep paralysis. Yet another factor is the general physical health problems that appear to be associated with sleep paralysis when using general physical health quality of life scales, though this has not always been confirmed.²⁵

There is very little research linking specific physical health problems like high body mass index, low systolic blood pressure with sleep paralysis. Measures of personality

traits, as measured by the Eysenck personality questionnaire, have not been found to be related to sleep paralysis frequency. Levels of waking state dissociative experiences, involving depersonalization, derealisation, and amnesia, were found to be related to both sleep paralysis frequency and the frequency/intensity of all three hallucination types. The degree to which individuals become absorbed in their mental fantasy has been linked to hallucination frequency and intensity, but another study did not find absorption to be related to overall episode frequency.²⁶ One study looked at intelligence in relation to sleep paralysis and found a significant negative association between intelligence quotient (IQ) and reports of lifetime isolated sleep paralysis, fearful isolated sleep paralysis, and fearful recurrent isolated sleep paralysis. A number of 'anomalous' sleep experiences appear to be more common in people who also experience sleep paralysis.²⁷

Experiencing nightmares appears to be common in those with sleep paralysis, as an association has been found in a number of studies. In a large population-level study, insomnia was not associated with increased prevalence of sleep paralysis, however non-restorative sleep, a common symptom of insomnia was associated with increased sleep paralysis rates (33% vs 13%). In a further study, it has been reported that disrupted sleep (defined as waking up repeatedly during the night) was a significant predictor of sleep paralysis. In non-clinical samples, multiple studies have examined the links between sleep paralysis and general mental health problems.²⁸

Studies have shown that poorer general mental health is significantly associated with frequency of sleep paralysis. Mirroring the clinical findings, anxiety-related symptoms and self-reported symptoms of depression appear to be associated with sleep paralysis. Significantly higher prevalence rates of sleep paralysis have been noted in patients with panic disorder²⁹ and post-traumatic stress disorder.³⁰

Scales for Evaluation of Sleep Paralysis

The amount one spends sleeping makes up for one-third of their lifetime. Data tells us that there is a 35% prevalence of sleep alterations at some point of time in life in the general population. Sleep is an important part of life and has an essential impact on our mental health. It is well known that to adequately define and quantify sleep is difficult. Instruments are needed for its evaluation and measurement that can decrease the bias due to the subjective nature of the construct. Some of the existing scales require the person to answer retrospectively according to what he/she recalls of his/her quality of sleep during the last month.

The short questionnaire on sleep in infants, Brief Infant Sleep Questionnaire (BISQ),³¹ is an instrument designed for the pediatric population. The Sleep Disturbance Scale³² for Children (SDSC) is made up of 27 Likert type items and is designed to detect sleep disorders in children and adolescents. Scales that have been designed for the adult population include different types of questionnaires that consider varied aspects of sleep. Some of the questionnaires include Sleep Quality Questionnaire of Oviedo (SQQ),³³ Sleep Timing

Questionnaire (STQ),³⁴ Basic Nordic Sleep Questionnaire,³⁵ Sleep Evaluation Questionnaire and Karolinska Sleep Diary (KSD).³⁶

Management of Sleep Paralysis

In many cases, sleep paralysis may not need the intervention of medical or mental health professionals since it may be a once-a-time experience. However, one must know when to seek professional help.³⁸

1. When sleep paralysis is a regular phenomenon
2. When sleeping is a daily struggle
3. Excessive anxiety related to sleeping
4. Symptoms of narcolepsy

Management of sleep paralysis comes into picture when it is a persistent condition.

Sleep Hygiene

Maintaining sound sleep hygiene, ensuring 6-8 hours of sleep, ensuring same sleeping times, creating a comfortable sleep environment, avoiding eating big meals, smoking, or drinking alcohol or caffeine shortly before going to bed and getting regular exercise before going to bed are some ways an individual can adapt to prevent sleep paralysis. However, sometimes, sleep paralysis management may demand the prescription of anti-depressants that are appropriately prescribed by mental health professionals.³⁹

Pharmacological Management

The most commonly used agents are tricyclic antidepressants and selective serotonin reuptake inhibitors with the mechanism of action being the suppression of REM sleep.⁴⁰ Clomipramine, Imipramine, Fluoxetine, and Sertraline have all been reported to reduce sleep paralysis.⁴¹⁻⁴² One of the better-studied agents is sodium oxybate (gamma-hydroxybutyric acid [GHB]).⁴³

Psychotherapy

The most basic therapy a clinician can provide is simple reassurance and psycho-education about the nature of sleep paralysis.⁴⁴ Cognitive-Behavior Therapy for Sleep Paralysis includes specific sleep hygiene and relaxation techniques for use during episodes, in vivo episode disruption techniques, ways to cope with frightening hallucinations, disputation of catastrophic thoughts, and imaginary rehearsal of successful resolutions to the episodes.⁴⁵ A similar approach using meditation and relaxation and mindfulness has been also reported to be useful.⁴⁶

Conclusions

Sleep paralysis is rare in clinical practice. There is a shortage of clinical trials and guidelines with regard to both its diagnosis and management. There is a need for clinicians to question patients about sleep paralysis to elicit the presence of the disorder and also further studies in the area shall enhance our understanding of this complex and vexing disorder.

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References

1. American Academy of Sleep Medicine. International Classification of Sleep Disorders, revised: Diagnostic and coding manual. Chicago, IL: American Academy of Sleep Medicine 2001.
2. Goode GB. Sleep paralysis. *Arch Neurol* 1962;6(3):228-34.
3. Panossian LA, Avidan AY. Review of sleep disorders. *Med Clin North Am* 2009;93(2):407-25.
4. Mitchell SW. Some Disorders of Sleep. *Am J Med Sci* 1980;1:109.
5. Wilson SAK. The Narcolepsies. *Brain* 1928;21:63-8.
6. Sharpless BA, Doghramji K. Sleep paralysis: historical, psychological, and medical perspectives. New York, NY: Oxford University Press; 2015.
7. Ness R. The Old Hag phenomenon as sleep paralysis: a biocultural interpretation. *Cult Med Psychiatry* 1978;2:e39-43.
8. Law S, Kirmayer L. Inuit interpretations of sleep paralysis. *Transcult Psychiatry* 2005;42:112-6.
9. Davies O. The nightmare experience, sleep paralysis, and witchcraft accusations. *Folklore* 2003;114:e203.
10. French CC, Santomauro J. Something wicked this way comes: causes and interpretations of sleep paralysis. In: Della Sala S, editor. Tall tales about mind-brain separating fact from fict. New York: Oxford University Press; 2007. p. 380-98.
11. French CC, Santomauro J, Hamilton V, Fox R, Thalbourne MA. Psychological aspects of the alien contact experience. *Cortex* 2008;44:1387-95.
12. McNally RJ. Sleep paralysis, sexual abuse, and space alien abduction. *Transcult Psychiatry* 2005;42:113-22.
13. Cheyne JA. Sleep paralysis and the structure of waking-nightmare hallucinations. *Dreaming* 2003;13:163-79.
14. Sharpless BA, Barber JP. Lifetime prevalence rates of sleep paralysis: a systematic review. *Sleep Med Rev* 2011;15:311-5.
15. Denis D, French CC, Gregory AM. A systematic review of variables associated with sleep paralysis. *Sleep Med Rev* 2018;38:141-57.
16. Ma S, Wu T, Pi G. Sleep paralysis in Chinese adolescents: a representative survey. *Sleep Biol Rhythms* 2014;12:46-52.
17. Cheyne JA, Rueffer SD, Newby-Clark IR. Hypnagogic and hypnopompic hallucinations during sleep paralysis: neurological and cultural construction of the nightmare. *Conscious Cogn* 1999;8:319-37.
18. Cheyne JA. Situational factors affecting sleep paralysis and associated hallucinations: position and timing effects. *J Sleep Res* 2002;11(2):169-77.
19. Pedrazzoli M, Pontes JC, Peirano P, Tufik S. HLA-DQB1 genotyping in a family with narcolepsy-cataplexy. *Brain Res* 2007;1165:1-4.
20. Mahlios J, Mignot E. The autoimmune basis of narcolepsy. *Curr Opin Neurobiol* 2013;23:767-73.
21. Sharpless BA. A clinician's guide to recurrent isolated sleep paralysis. *Neuropsychiatr Dis Treat* 2016;12:1761.
22. Newman CJ, O'Regan M, Hensey O. Sleep disorders in children with cerebral palsy. *Dev Med Child Neurol* 2006;48(7):564-8.
23. Munezawa T, Kaneita Y, Osaki Y, Kanda H, Ohtsu T, Suzuki H et al. Nightmare and sleep paralysis among Japanese adolescents: a nationwide representative survey. *Sleep Med* 2011;12(1):56-64.

24. De Jong JT. Cultural variation in the clinical presentation of sleep paralysis. *Transcult Psychiatry* 2005;42(1):78-92.
25. Dauvilliers Y, Maret S, Tafti M. Genetics of normal and pathological sleep in humans. *Sleep Med Rev* 2005;9(2):91-100.
26. Ohaeri JU, Odejide AO, Ikuesan BA, Adeyemi JD. The pattern of isolated sleep paralysis among Nigerian medical students. *J Natl Med Assoc* 1989;81(7):805-9.
27. Blackmore S, Cox M. Alien abductions, sleep paralysis and the temporal lobe. *Eur J UFO Abduct Stud* 2000;1:113-8.
28. Ohayon MM, Sagales T. Prevalence of insomnia and sleep characteristics in the general population of Spain. *Sleep Med* 2010;11(10):1010-8.
29. Friedman S, Paradis C. Panic disorder in African-Americans: symptomatology and isolated sleep paralysis. *Cult Med Psychiatry* 2002;26(2):179-98.
30. Hinton DE, Pich V, Chhean D, Pollack MH, McNally RJ. Sleep paralysis among Cambodian refugees: association with PTSD diagnosis and severity. *Depress Anxiety* 2005;22(2):47-51.
31. Sadeh A. A brief screening questionnaire for infant sleep problems: validation and findings for an Internet sample. *Pediatr* 2004;113(6):e570-7.
32. Bruni O, Ottaviano S, Guidetti V, Romoli M, Innocenzi M, Cortesi F, et al. The Sleep Disturbance Scale for Children (SDSC) Construction and validation of an instrument to evaluate sleep disturbances in childhood and adolescence. *J Sleep Res* 1996;5(4):251-61.
33. Kato T. Development of the Sleep Quality Questionnaire in healthy adults. *J Health Psychol* 2014;19(8):977-86.
34. Monk TH, Buysse DJ, Kennedy KS, Potts JM, DeGrazia JM, Miewald JM. Measuring sleep habits without using a diary: the sleep timing questionnaire. *Sleep* 2003;26(2):208-12.
35. Talero-Gutiérrez C, Moreno CB, González-Reyes R, Palacios L, de la Peña F, Muñoz-Delgado J. Sleep evaluation scales and questionnaires: a review. *Actas Esp Psiquiatr* 2008;36(1):50-9.
36. Partinen M, Gislason T. Basic Nordic Sleep Questionnaire (BNSQ): a quantitated measure of subjective sleep complaints. *J Sleep Res* 1995;4:150-5.
37. Åkerstedt T, Hume KE, Minors D, Waterhouse JI. The subjective meaning of good sleep, an intraindividual approach using the Karolinska Sleep Diary. *Percept Motor Skills* 1994;79(1):287-96.
38. Vgontzas, MD AN, Kales, MD A. Sleep and its disorders. *Ann Rev Med* 1999;50(1):387-400.
39. Kotagal S, Pianosi P. Sleep disorders in children and adolescents. *BMJ* 2006;332(7545):828-32.
40. Nishino S. Narcolepsy: pathophysiology and pharmacology. *J Clin Psychiatry* 2007;68:9-15.
41. Lepola U, Koponen H, Leinonen E. Sleep in panic disorders. *J Psychosom Res* 1994;38:105-11.
42. Langdon N, Shindler J, Parkes JD, Bandak S. Fluoxetine in the treatment of cataplexy. *Sleep* 1986;9(2):371-3.
43. US Xyrem® Multicenter Study Group. A randomized, double-blind, placebo-controlled multicenter trial comparing the effects of three doses of orally administered sodium oxybate with placebo for the treatment of narcolepsy. *Sleep* 2002;25(1):42-9.
44. McKenna L, McNicholas F. Childhood-onset narcolepsy. *Eur Child Adolesc Psychiatry* 2003;12(1):43-7.
45. Trockel M, Manber R, Chang V, Thurston A, Taylor CB. An e-mail delivered CBT for the sleep-health program for college students: effects on sleep quality and depression symptoms. *J Clin Sleep Med* 2011;7(03):276-81.
46. Carlson LE, Garland SN. Impact of mindfulness-based stress reduction (MBSR) on sleep, mood, stress and fatigue symptoms in cancer outpatients. *Int J Behav Med* 2005;12(4):278-85.