

ARTICLE

Sleep Paralysis and Hallucinations: What Clinicians Need to Know

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... 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 breast, so that she could hardly speak or breathe, and when she endeavoured to throw off the burden, she was not able to stir.

Van Diemberbroeck, 1689 (as cited in Kompanje, 2008, pp. 183–185)

The American Sleep Disorder Association (1990) defines sleep paralysis as consisting of an inability to perform voluntary movements either at sleep onset (hypnagogic) or upon awakening either during the night or in the morning (hypnopompic). Often sleep paralysis is accompanied by various types of hallucinations and these are often in the presence of intense fear. These phenomena, however, are not always necessarily of a frightening nature (Cheyne, Newby-Clarke, & Rueffer, 1999a). They can last from a few minutes to 20 minutes. The individual feels as if they are conscious and they often take in the “real in their environment” and this becomes intermixed with their hallucination.

Early reported prevalence rates vary from 3 to 62% (Cheyne et al., 1999a). These prevalence figures in the literature are misleading, as the figures usually refer to sleep paralysis unaccompanied by hallucinations (Cheyne et al., 1999a). Thirty per cent of a sample of university students reported at least one experience of sleep paralysis. Three quarters of those reported at least one hallucinoid experience and approximately 10% experienced three or more hallucinations (Cheyne et al., 1999a). These results are consistent with recent surveys in which prevalence rates of 25 to 40% are reported (Fukuda, Miyasita, Inugami, & Ishihara, 1987; Spanos, McNulty, DuBreuil, Pires, & Burgess, 1995).

Another reason for disparities in prevalence rates in the literature is due to type of descriptions used. Studies using folk expression – such as the old hag phenomenon in Newfoundland, ghost oppression in China and *Kanashibari* (“the bands”) in Japan – have yielded higher prevalence rates than studies using clinical descriptions which include the paralysis and not the accompanying hallucinations (Jiménez-Genchi, Ávila-Rodríguez, Sánchez-Rojas, Vargas Terrez, &



Nenclares-Portocarrero, 2009). In Mexico the folk expression used is "a dead body climbed on top of me". Jimenez-Genchi et al. (2009) evaluated the prevalence of sleep paralysis using this folk expression in a sample of Mexican adolescents. Sixty-one percent had two or more episodes of sleep paralysis with hallucinations. The findings suggest that the phenomenon is highly familiar to adolescents in Mexico. The authors highlighted research with similar findings in Japan and China. In contrast, in Cheyne et al.'s (1999a) Canadian research very few of the participants had heard of the phenomenon prior to taking part in research. This paper's authors hypothesise that the same might be likely in Ireland. One hypothesis for the difference in recognition of symptoms is that, in Japan, China and Mexico there is a phrase to describe the phenomenon, whereas in Canada (Fukuda, Ogilvie & Takeuchi, 2000) and Ireland there is no common expression for sleep paralysis. In the Mexican study one in four reported sleep paralysis without hallucinations and seventy two percent of the cases reported sleep paralysis with hallucinations. The prevalence rates compared to rates observed by Cheyne et al. (1999a) in Canadian undergraduate students.

Therefore, an individual's interpretation of the phenomenon may depend on their cultural explanation of the phenomena, if there is one, or the belief system of the person (Sherwood, 2002). Fukuda et al. (2000) compared the recognition of sleep paralysis among adults in Canada and Japan and hypothesised that a different cognitive framework was responsible for different rates of occurrence. Fukuda et al. found no difference in the prevalence or symptoms of sleep paralysis; however, more Canadians believed sleep paralysis to be a dream-state where many did not report the symptom of paralysis. The term used in Japan to describe sleep paralysis is *Kanashibari*, meaning "metal bands binding a person". Simard and Nielson (2005) suggested that sleep paralysis and social anxiety are symptoms of a previous social trauma. They suggested that felt presence may be imagery that replicates a past traumatic social event. Hence, the phenomenon is more common among the socially anxious.

The second author of this paper has worked for a number of years with adults who have reported traumatic childhood experiences. Over this time, and more recently in the last number of weeks, a handful of patients have reported that a

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psychic or tarot reader they have attended told them that they have experienced childhood sexual abuse at the hands of a close relative. The patients described how they had told the psychic that they had no waking memories of actual abuse, but that they had described hypnagogic or hypnopompic hallucinations with sleep paralysis of a figure with no face sitting or hovering near their bed and that they had felt fear and a pressure on their chest – as if someone was lying on them. The psychic's interpretation was that their father had sexually abused them as a child. This had disastrous effects on the person's family and their relationship or perception of their relationships with the no-face intruder during their hallucination, which was now reformulated by the psychic as their father. This type of event, however, is not as unusual as one would hope. Browne (2008) recalled that:

When the silence was finally broken [childhood sexual abuse], this brought in its train a number of over-enthusiastic therapists, counsellors and others. Because those who have been traumatised and abused tend to present with a wide range of symptoms, these therapists saw abuse lurking below the surface in many situations where in fact no such abuse had actually occurred. They actively suggested this to patients and, particularly with the use of methods such as hypnosis, or peer pressure in fundamentalist therapeutic group, highly susceptible subjects complied and others were wrongly accused. (p. 300)

Thus one of the motivations in writing this piece was to warn against the over-interpretation of normal sleep events amongst a clinical population.

A Model of Sleep Paralysis

Cheyne, Reuffer and Newby-Clarke (1999b) developed a three-factor model of hypnagogic and hypnopompic experiences that accompany sleep paralysis. They used the

Waterloo Unusual Sensory Experiences Survey across a number of samples in order to assess the frequency of their events. Exploratory factor analysis resulted in a three-factor model:

1. The first factor was called "Intruder" and it consisted of fear, a sensed presence, and auditory and visual hallucinations.
2. The second factor was called "Incubus" and this consisted of breathing difficulties, feeling pressure on the chest and pain and it was consistent with a physical assault. (Both Intruder and Incubus were moderately correlated with each other and were associated with intense fear)
3. The third factor was called "Unusual Bodily Experiences" and it comprised of "out-of-body" and floating experiences. There was on some occasions a feeling of bliss as opposed to fear associated with this factor.

Cheyne et al. (1999b) suggested that the intruder factor begins with amygdalar activation. This results in a hyper-vigilant state in which the detection threshold for threat and danger is lowered and biased. They argued that most hallucinations were associated with specific physiological conditions identified in REM sleep. Maquet et al. (1996) reported significant activation of the amygdaloid complex during REM dreams. Some Incubus features are similar to REM shallow rapid breathing. Cheyne et al. (1999b) hypothesised that when attempts by the person to control breathing are unsuccessful, the resistance is interpreted as pressure. Increased airflow resistance can result in feelings of choking which can result in panic and efforts to overcome the paralysis.

Cheyne's (1999b) model proposes hallucinations begin with a sense of a presence which is emotionally salient and this then leads to an effort to support the presence of the feeling with sensory evidence: "I feel terrified and is if something awful is about to happen, therefore I start to scan in my external and internal realities for evidence of such a threat". The three-factor model is consistent with descriptions of the phenomenon from various cultures. Cheyne (2005) found that the felt presence tends to reduce in frequency over exposure to sleep paralysis events and he confirmed that the intensity of hallucinations also appeared to vary on a continuum.

Cheyne (2003) evaluated the reliability of his three-factor model across a sample of 5,799 participants. Choking and death thoughts were added to the Incubus factor. Four new variables were included in the Unusual Bodily Experiences factor, relabeled as "Vestibular-Motor". The four new variables were (a) flying, (b) falling, (c) autoscoping and (d)

illusionary motor movements. Cheyne proposes the function of the threat activated vigilance system (amygdala) is to clarify ambiguous signs of danger. Cheyne argued that this state is experienced as a threatening sense of presence. Causal modeling suggests the first two factors of Intruder and Incubus are strongly thematically and sequentially linked by the theme of threat and assault, and the third factor, Vestibular-Motor symptoms, is more autonomous.

Cheyne and Girard (2007a and 2007b) in a prospective study of 383 individual descriptions of hallucinations found that felt presence was the core experience of sleep paralysis which then led on to other hallucinoid experiences. Vestibular-motor symptoms were less common than the intruder or incubus hallucinations. The breathing constriction and death thoughts during the felt presence phase contributed to the fear, and finally the breathing difficulties and felt presence were especially associated with pressure and tactile hallucinations. Highly experienced sleep paralysis experiencers had more vestibular-motor hallucinations, maybe suggesting that these people were starting to master their unusual experience.

However, as with all memories, it is probable that with a higher level of emotional valency, we remember that which is more salient. There are many accounts of positive Hypnopompic hallucinations, the present author's favourite one being the recollection by the neurologist, Oliver Sacks, of his "Mendelssohn awakening" after having been in an accident and spending several weeks in hospital:

A friend brought me a tape recorder, along with a single cassette of the Mendelssohn Violin Concerto. I played this constantly, dozens of times a day, and one morning, in that delicious hypnopompic state that follows waking, I heard the Mendelssohn playing. I was not dreaming but fully aware that I was lying in a hospital bed, and that my tape recorder was by my side. One of the nurses, I thought, must have put it on, as a novel way of waking me up. Gradually I surfaced, the music continuing all the while until I was able to stretch out a sleepy hand to turn the recorder off. When I did this, I found that the machine was off. In the moment of realizing this, and being startled into full wakefulness, the hallucinatory Mendelssohn abruptly ceased.
(Sacks, 2007, p. 281)

Summary

Sleep paralysis is a relatively common phenomenon. Most people who have experienced paralysis also report hallucinatory experiences. The symptoms appear to cross cultural divides, but the narrative prevalent in a society tends

to dictate the phenomenology of the hallucinations experienced. No epidemiological studies of the phenomena have been completed in Ireland to date. Clinicians need to be aware of the phenomenon and how it can be misperceived as something more malevolent. It would be interesting for future researchers to assess whether our cultural narratives result in higher incidences of fairies, banshees, leprechauns, the devil or a sexual abuser appearing during their hallucinatory experience.

References

- American Sleep Disorder Association. (1990). *International classification of sleep disorders: Diagnostic and coding manual*. Rochester, MN: Author.
- Browne, I. (2008). *Music and madness*. Cork: Cork University Press.
- Cheyne, J. A. (2003). Sleep paralysis and the structure of waking-nightmare hallucinations. *Dreaming*, 13, 163–179.
- Cheyne, J. A. (2005). Sleep paralysis episode frequency and number, types, and structure of associated hallucinations. *Journal of Sleep Research*, 14, 319–324.
- Cheyne, J. A., & Girard, T. A. (2007a). Paranoid delusions and threatening hallucinations: A prospective study of sleep paralysis experiences. *Consciousness and Cognition*, 16, 959–974.
- Cheyne, J. A., & Girard, T. A. (2007b). The nature and varieties of felt presence experiences: A reply to Nielsen. *Consciousness and Cognition*, 16, 984–991.
- Cheyne, J. A., Newby-Clarke, I. R., & Rueffer, S. D. (1999a). Sleep paralysis and associated hypnagogic and hypnopompic experiences. *Journal of Sleep Research*, 8, 313–317.
- Cheyne, J. A., Rueffer, S. D., & Newby-Clarke, I. R. (1999b). Hypnagogic and hypnopompic hallucinations during sleep paralysis: neurological and cultural construction of the night-mare. *Consciousness and Cognition*, 8, 319–337.
- Fukuda, K., Miyasita, A., Inugami M., & Ishihara, K. (1987). High prevalence of isolated sleep paralysis: Kanashibari phenomenon in Japan. *Sleep*, 10, 279–286.
- Fukuda, K., Ogilvie, R. D., & Takeuchi, A. T. (2000). Recognition of sleep paralysis among normal adults in Canada and in Japan. *Psychiatry and Clinical Neurosciences*, 54, 292–293.
- Jiménez-Genchi, A., Ávila-Rodríguez, V. M., Sánchez-Rojas, Vargas Terrez, B. A., & Nenclares-Portocarrero, A. (2009). Sleep paralysis in adolescents: The “a dead body climbed on top of me” phenomenon in Mexico. *Psychiatry and Clinical Neurosciences*, 63, 546–549.
- Kompanje, E. J. O. (2008). “The devil lay upon her and held her down”: Hypnagogic hallucinations and sleep paralysis described by the Dutch physician Isbrand van Diemerbroeck (1609–1674) in 1664. *Journal of Sleep Research*, 17, 464–467.
- Maquet, P., Peters, J., Aerts, J., Delfiore, G., Degueldre, C., Luxen, A., & Franck, G. (1996). Functional neuroanatomy of human rapid-eye movement sleep and dreaming. *Nature*, 383, 163–166.
- Sacks, O. (2007). *Musicophilia: Tales of music and the brain*. New York: Picador.
- Sherwood, S. T. (2002). Relationship between the hypnagogic/hypnopompic states and reports of

anomalous experiences. *Journal of Parapsychology*, 66, 127–150.

- Simard, V., & Nielsen, T. A. (2005). Sleep paralysis-associated sensed presence as a possible manifestation of social anxiety. *Dreaming*, 15, 245–260.
- Spanos, N. P., McNulty, S. A., DuBreuil, S. C., Pires, M., & Burgess M. F. (1995). The frequency and correlates of sleep paralysis in a university sample. *Journal of Research in Personality*, 29, 285–305.

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