

CASE REPORT*Volume 7 Issue 3****REM Behavior Disorder and Sleep-Related Hallucinations: A Case Study*****Sammar Atassi, MD¹, Katherine Atassi, PhD, RN²,
Megan Sandberg, MS⁴¹****ABSTRACT**

This is a case study of Idiopathic REM Behavior Disorder (RBD) lasting 5 years with superimposed Idiopathic Complex Nocturnal Visual Hallucination Disorders (CNVHD). The coexistence of these two distinct idiopathic sleep disorders has not been reported in the literature, even though they both carry similar etiologies and have strong associations with neurodegenerative diseases. Greater awareness, education, and further research are warranted.

KEYWORDS

REM Behavior Disorder (RBD), Idiopathic Complex Nocturnal Visual Hallucinations Disorder (CNVHD), Sleep Related Hallucinations, Parkinson's Disease, Neurodegenerative Disorders, Lewy Body Dementia

Author affiliations are listed at the end of this article.

Correspondence to:
Sammar Atassi, MD
West Virginia University
School of Medicine
wwmedical@yahoo.com

INTRODUCTION

Before the set-up of this case study, it is important to have a brief review of the etiology and diagnoses of rapid eye movement sleep behavior disorder (RBD) and sleep-related hallucinations. Both of these sleep disorders are less commonly diagnosed and are often initially mistaken for other diagnoses.

RAPID EYE MOVEMENT SLEEP BEHAVIOR DISORDER

RBD is a sleep parasomnia that was first defined in 1986.¹ RBD is characterized by abnormal behaviors emerging during rapid eye movement (REM) sleep that may cause sleep disruption and possible sleep-related injury.^{2,3} Sleep-related injury is fairly common and is usually a result of the enactment of violent or unpleasant dreams. Often these patients seek medical attention due to related injuries or potential injuries to themselves and/or their bed partner. Typically, at the end of an RBD episode, the individual awakens quickly, becomes rapidly alert, and reports a dream with a coherent and often elaborate story. Those reported dream actions often correspond closely to the observed sleep behavior.^{2,3} If the person isn't awakened by an observer, the person will act out

their dreams during REM sleep but have little to no recollection of dream content.

The prevalence of RBD is approximately 0.5% in the general population and 2% in older adults.⁴ Because of this low prevalence, the vast majority of cases go unrecognized.^{2,3} RBD is more prevalent in men than in women and often emerges in later life after the age of 50 years.^{2,3}

RBD can be classified as acute, chronic, or spontaneous. The acute form of RBD may be diagnosed while taking certain medications such as selective serotonin reuptake inhibitors (SSRIs) or during drug withdrawal. The chronic form of RBD is usually idiopathic or associated with an underlying degenerative neurologic condition. Up to two-thirds of men above age 50 thought to have idiopathic RBD will go on to develop a neurodegenerative condition.⁵ Spontaneous RBD is a prodromal syndrome of alpha-synuclein neuropathology and is widespread among patients with Parkinson's disease [33 to 50%], multisystem atrophy [80 to 95%], and dementia with Lewy body [80%].^{6,7,8,9,10,11} RBD can be strongly linked with type I narcolepsy, though this usually occurs in younger patients and is characterized by the lack of



sex predominance, less complex movements, and less violent behavior in REM sleep.^{2,3}

The characteristic polysomnogram (PSG) finding includes the loss of normal rapid eye movement (REM), atonia or increased phasic electromyographic (EMG) activity during REM sleep, or both.¹² In addition, differential diagnoses should include sleepwalking, sleep terrors, obstructive sleep apnea, nocturnal seizures, rhythmic movement disorder, and sleep-related dissociative disorder.

SLEEP-RELATED HALLUCINATIONS

Hallucinations are defined as the perception of an object in the absence of an external stimulus and can be further delineated as visual, olfactory, gustatory, auditory, and tactile.²

Visual hallucinations have numerous etiologies including psychiatry, neurology, and ophthalmology, and they often initially trigger a request for psychiatry consultation.¹³ Differential diagnoses for visual hallucinations to consider include psychosis, schizophrenia/schizoaffective disorder, delirium, migraines, seizures, pedicular hallucinosis, Charles Bonnet Syndrome, and dementia with Lewy body.¹³ Interestingly, visual hallucinations occur in more than 20% of patients with Lewy body dementia.

Sleep-related hallucinations (SRH) are a type of parasomnias that occur at sleep onset (hypnagogic) or upon awakening from sleep (hypnopompic).² Hypnagogic and hypnopompic hallucinations are common in narcolepsy but can also occur in a high percentage of the general population; they are more common in younger persons and occur more frequently in women than men.²

The second type of SRHs is the complex nocturnal visual hallucination disorder (CNVHD).² SRHs are predominantly visual but may include auditory or tactile phenomena; it is presumed most SRHs are due to dream ideation of REM sleep intruding to wakefulness.² CNVHDs typically occur following a sudden awakening without recall of preceding dreams, and they usually take the form of complex, vivid, relatively immobile images of people or animals sometimes distorted in shape or size.² These hallucinations may remain present but usually disappear if ambient illu-

mination is increased. Patients are clearly awake but often the initially perceived hallucinations are real and frightening.² CNVHDs are rare and commonly associated with neurological disorders (narcolepsy, Parkinson's disease, Lewy body dementia), visual disorders (Charles Bonnet syndrome), and medications (beta-blockers, dopaminergic agents).¹⁴ In addition, an important differential diagnosis to rule out is epileptic seizures.

CASE STUDY

The patient is a 67-year-old Caucasian male referred to the sleep center by his primary care physician due to visual hallucinations that occur during sleep and associated with restless sleep. About 10 years ago, the patient developed episodes of moaning and screaming during sleep. The patient's wife stopped sleeping in the same bed with him because of the frequency and restlessness. Then, about 5 years ago, the patient reported episodes of thrashing and acting out his dreams while asleep. The movement was so violent that the patient reported kicking and thrashing in bed and occasionally hitting the wall and recalled a "sore ankle" from hitting the wall. He denied ever falling out of bed. The patient described his own behavior as "aggressive" during sleep as well as reporting feeling restless and experiencing frequent arousals throughout the night.

Within the past year, the patient developed hallucinations during sleep. These hallucinations never occurred during the day or in the evening or upon falling asleep, but they usually occurred when he was awake at night due to restless sleep. These were visual hallucinations, never tactile or auditory, and usually involved seeing hooded/cloaked figures. These figures were faceless; occasionally, he saw images of animals as well. These images disappeared when he turned on the light or got out of bed to take a closer look. These hallucinations generally occurred once weekly over the past year. He was also referred for a psychiatric consultation due to these hallucinations. The patient has a history of depression, though he feels that his depression is stable with Zoloft 50 mg that he has taken for the past 15 years. In addition, the patient also has a history of hypertension and diabetes. His other medications include amlodipine, doxazosin, glimepiride, losartan, and tamsulosin. He denied any tremors or memory loss, daytime halluci-



nations, or delusions. His family history includes his father's Parkinson's disease, and depression in both parents. He has one sister with schizoaffective disorder and a son diagnosed with bipolar disorder.

His neurological exam was normal without evidence of extrapyramidal signs, and his psychological exam was also normal. He scored 26/30 on his Mini-Mental State Examination (MMSE) and a 7 on the Epworth Sleepiness Scale.

Nocturnal polysomnogram revealed poor sleep efficiency of 75% without evidence of obstructive sleep apnea or periodic limb movements, but he met the criteria for the diagnosis of RBD. Visual hallucinations were not reported during the sleep study.

DISCUSSION

This is a case of idiopathic RBD lasting 5 years with superimposed idiopathic CNVHD in a 67-year-old male in absence of an acute psychiatric disorder and neurodegenerative disease symptoms such as Parkinson's disease or Lewy body dementia. The age of onset is consistent with idiopathic RBD. The diagnosis of depression and the concurrent use of SSRIs in the past 15 years has no bearing on that diagnosis.

The coexistence of these two distinct idiopathic sleep disorders has not been reported in the literature, even though they both carry similar etiologies and have strong associations with neurodegenerative diseases.

On the other hand, the coexistence of the most prevalent subtypes of sleep-related hallucination (hypnagogic and hypnopompic hallucinations) and RBD has been reported, but only in patients with Parkinson's disease. This is not surprising as they appear to arise predominantly from sleep-onset REM periods.¹⁵ However, CNVHDs during sleep are very rare, and few available polysomnography reports of CNVHDs suggest an onset from non-REM sleep.²

Longitudinal studies of idiopathic RBD have shown a strong association with eventual conversion to a neurodegenerative disease, whereas 38% to 65% of RBD patients have developed alpha synucleinopathy 10 to 20 years after RBD presentation.¹⁶ In additional support of this association, a series of autopsies of

RBD patients showed underlying synucleinopathy in up to 90% of patients.¹⁷

CNVHDs during sleep are commonly associated with other neurological disorders such as narcolepsy, Parkinson's disease, and Lewy body dementia.¹⁸ In contrast to the extent of studies of other REM-related phenomena, it is unclear whether CNVHDs are an independent entity as opposed to representing a final common pathway of a range of other disorders.²

We hypothesize that CNVHDs are a feature of this patient's RBD, and we believe that its prevalence is more common than reported; instead, it is frequently diagnosed as a psychiatric disorder and treated as such.

The fact that the patient's RBD symptoms (dream enactment) and his complex nocturnal sleep hallucinations have completely resolved with clonazepam at 0.5 mg at bedtime, which is considered the gold standard for the treatment of RBD, further solidifies the hypothesis. However, it is important to be mindful that the patient has a family history of Parkinson's disease, which raises the flag of the possibility of the development of a neurodegenerative disorder in the future. Indeed, if this occurs, Parkinson's disease should be considered as a common etiology for both of his conditions.

Further research is needed to determine the precise etiology and pathophysiology of complex nocturnal visual hallucinations.

AUTHOR AFFILIATIONS

1. West Virginia University School of Medicine, Morgantown, West Virginia
2. West Virginia University School of Nursing, Morgantown, West Virginia



REFERENCES

1. Schenck, C. H. Bundlie, S. R., Ettinger, M. G., Mahowald, M. W. (1986). Chronic behavioral disorder of human REM sleep: A new category of parasomnia. *Sleep*, 9, 293-308.
2. American Academy of Sleep Medicine. (2014). International classification of sleep disorders.(3rd ed.). American Academy of Sleep Medicine.
3. Chiu, H. F. K., Wing, Y. K. Lam, L. C. W., et al. (2000). Sleep-related injury in the elderly – an epidemiological study in Hong Kong. *Sleep*, 23, 513-517.
4. Haba-Rubio, J., Frauscher, B., Marques-Vidal, P., et al. (2018). Prevalence and determinants of Rapid eye movement sleep behavior disorder in the general population. *Sleep*, 41.
5. Boeve, B. F., Silber, M. H., Saper, C. B., et al. (2007). Pathophysiology of REM sleep behaviour disorder and relevance to neurodegenerative disease. *Brain*, 130, 2770-2788.
6. Boeve, B. F. (2010). REM sleep behavior disorder: Updated review of the core features, the
7. REM sleep behavior disorder-neurodegenerative disease association, evolving concepts controversies, and future directions. *Annals of the New York Academy of Sciences*, 1184:15.
8. Boeve, B. F., Silber, M. H., Ferman, T. J. (2004). REM sleep behavior disorder in Parkinson's disease and dementia with Lewy bodies. *Journal of Geriatric Psychiatry and Neurology*, 17:146.
9. Gagnon, J. F., Bedard, M. A., Fantini, M. L. et al. (2002). REM sleep behavior disorder and REM sleep without atonia in Parkinson's disease. *Neurology*, 59:585.
10. Plazzi, G. Corsini, R., Provini, F., et al. (1997). REM sleep behavior disorders in multiple system atrophy. *Neurology*, 48:1094.
11. Plomhause, L. Dujardin, K., Duhamel, A., et al. (2013). Rapid eye movement sleep behavior disorder in treatment-naïve Parkinson disease patients. *Sleep Medicine*, 14:1035.
12. Poryazova, R. Oberholzer, M. Baumann, C. R., Bassettie, C. L. (2013). REM sleep behavior disorder in Parkinson questionnaire-based survey. *Journal of Clinical Sleep Medicine*, 9:55.
13. Ebrahim, I. O. & Peacock, K. W. (2005). REM sleep behavior disorder – psychiatric presentations: A case series from the United Kingdom. *Journal of Clinical Sleep Medicine*, 1(1), 43-47.
14. Teeple, R. C., Caplan, J. P. & Stern, T. A. (2009). Visual hallucinations: Differential diagnosis and treatment. *Primary Care Companion to the Journal of Clinical Psychiatry*, 11(1), 26-32.
15. Dholakia, S. A. (2020). A patient with nocturnal visual hallucinations. *Journal of Clinical Sleep Medicine*, 16(5), 821-822.
16. Aminoff, M.J., & Josephson, S.A. (2014). *Aminoff's neurology and general medicine*. (5th ed.). Elsevier. <https://doi.org/10.106/C2012-0-03031-1>
17. Schenck, C. H. Bundlie, S. R., & Mahowald, M. W. (1996). Delayed emergency of a parkinsonian disorder in 38% of 29 older men initially diagnosed with idiopathic rapid eye movement sleep behavior disorder. *Neurology*, 46(2), 388-393.
18. Boeve, B.F., Silber, M.H., Ferman, T.J., et al. (2013). Clinicopathologic correlations in 172 Cases of rapid eye movement sleep behavior disorder with or without a coexisting neurological disorder. *Sleep Medicine*, 14(8), 754-762.
19. Manaford, M., & Andermann, F. (1998). Complex visual hallucinations: Clinical and neurobiological insights. *Brain*, 121, 1819-1840.

