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Brief Communication

Parasomnia overlap disorder with adolescent-onset presumed REM sleep behavior disorder converting to Parkinson's disease after 48 years

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ABSTRACT

Background: It is now recognized that the vast majority of individuals with typical RBD will develop a synucleinopathy; usually 11–16 years after symptom onset. Parasomnia Overlap Disorder (POD) with adolescent-onset dream enactment behavior with phenoconversion to neurodegenerative disease after a long latency has not been previously described.
Patient: We present a case of a 65-year-old man with presumptive POD who had co-morbid childhood onset sleep walking and adolescent-onset dream enactment behavior beginning at age 17, with subsequent evolution to an increasingly troublesome REM sleep behavior disorder (RBD) at age 64 with Parkinson's Disease (PD) developing a year later.
Results: Polysomnography performed at age 64 was consistent with a diagnosis of RBD. Dream enactment behavior preceded PD diagnosis by at least 48 years. Our case represents the youngest reported RBD case who developed PD.
Conclusions: We report the first case of adolescent onset, presumed RBD in the context of presumptive POD developing neurodegenerative disease. Adolescent-onset RBD may have similar prognostic implications as typical RBD, where future phenoconversion to a synucleinopathy is expected.
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1. Introduction

The long term outcome of adolescent onset REM sleep behavior disorder (RBD) has not been well described [1]. RBD is a REM parasomnia characterized by violent dream enactment behavior with a typical onset after age 50 [2]. The vast majority of individuals with typical RBD will develop a synucleinopathy; usually 11–16 years after symptom onset, with current estimates exceeding 80% [3]. One individual with probable RBD beginning at age 27 has been reported to develop PD 50 years later, which represents the longest latency period reported to date [4]. Here, we report a patient with adolescent-onset presumed RBD beginning at age 17 with subsequent development of Parkinson's Disease (PD) at the age of 65, representing a latency period of 48 years. There was also a history of sleepwalking and sleep talking beginning in childhood and persisting until age 55, which is suggestive of a diagnosis of parasomnia overlap disorder (POD) [5], which is a rare disorder defined by the presence of comorbid NREM parasomnia with RBD. As of this publication, POD has not been previously reported to be associated with subsequent neurodegeneration [6].

2. Report of case

A 64-year-old man presented to us with recent worsening of dream enactment behavior, which had first begun at age 17. At that age whilst sleeping in a bunk bed, he dreamt that pallets were falling on his head and had awoken the man above him in the process of kicking the pallets away. These events continued to occur a few times a month but became increasingly frequent through the fifth decade (with this history collaborated by his wife to whom he had been married to since the age of 21). There were no complaints of excessive daytime sleepiness or cataplexy in his youth.

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There was also a history of infrequent sleep talking and sleep walking beginning in early childhood, with sleepwalking persisting albeit infrequently until the age of 55. Five years ago, he was diagnosed with mild obstructive sleep apnea (OSA) with an apnea hypopnea index (AHI) of 9.0/hr and treated successfully with continuous positive airway pressure (CPAP). REM sleep was not achieved during this first in-patient video sleep study. Other medical problems included hypertension, hypercholesterolemia and back pain, for which he was medicated with simvastatin and codeine phosphate. He was otherwise well with no features to suspect a diagnosis of narcolepsy or other neurodevelopmental disorders. There was no antidepressant or heavy alcohol use during his life, and he was not taking other medications that could have predisposed him to develop RBD early.

At age 64, dream content became increasingly intrusive and violent. He would often dream of being attacked and would injure the upper limbs and leap out of bed. The frequency of these events now increased to between five and eight episodes a month. Standard laboratory video polysomnography performed with his usual CPAP recorded three motor events arising from REM sleep where he observed to be punching and kicking for up to 20 s. Additionally, frequent leg jerks occurred in REM sleep, corresponding to phasic EMG activity in the lower limbs. Poor signal quality on the chin EMG did not allow the definitive presence of REM sleep without atonia to be scored. However, the motor events recorded were consistent with a diagnosis of RBD. OSA was adequately treated with a normal AHI of 4.1/hr. The PLM index was normal at 0.7/h. He was treated with melatonin 3 mg which completely abolished dream enactment behavior.

At age 65, he developed a resting tremor in his right arm. Cogwheeling rigidity and bradykinesia was detected in the right upper limb. There were no autonomic symptoms or cognitive impairment reported. These findings were consistent with a diagnosis of PD. Levodopa therapy was initiated a year later with good treatment response.

3. Conclusion

We present a patient with a diagnosis of POD with adolescent onset probable RBD who developed PD after a prolonged latency of 48 years. This represents the youngest reported case of probable adolescent-onset RBD developing PD later at age 64, and the second longest duration between RBD onset and synucleinopathy development. Adolescent onset RBD with delayed phenoconversion to a synucleinopathy has not been well described, and POD has never been reported to be linked to subsequent neurodegeneration [6]. An 18-year-old diagnosed with juvenile PD was reported to develop RBD concurrently or shortly before PD diagnosis [7]. In another retrospective case series, three subjects with definite RBD and five subjects with probable RBD with onset in their 20s had developed a neurodegenerative disorder much earlier in their 50s [4], but information regarding the presence of co-morbid sleepwalking or sleep talking to suggest a diagnosis of POD was not available. However, another retrospective series, eight individuals with early-onset RBD with onset between ages 18–29 were not reported to develop subsequent neurodegenerative disease [1].

RBD can be co-morbid in NREM parasomnias in parasomnia overlap disorder (POD) [5]. Co-existing NREM parasomnias are frequently reported in young adult onset RBD [8] and could potentially represent a diagnosis of POD, as seen in our patient. POD is regarded as a variant of RBD, but phenoconversion to neurodegenerative disease in a childhood or adolescent-onset case has never been reported. POD has not been well described in literature, however, our case bears striking resemblance to a recent POD case. Zhou et al. [9], described a 63-year old Chinese man with childhood onset sleepwalking and sleep talking disappearing after the age of 40 with co-morbid recurrent violent, dream enactment behaviors beginning at age 11 that had continued to persist in late-life. RBD was confirmed on a PSG at age 63, but phenoconversion to neurodegenerative disease did not occur. Dream-like mentation with dream enactment has been occasionally reported in NREM parasomnias, with violent limb movements also observed [10,11]. However, as the prevalence of parasomnias in childhood is very high, the co-existence of childhood parasomnias, RBD and PD in our case could also represent a chance association.

In childhood and adolescence, RBD is commonly present in the context of narcolepsy, idiopathic hypersomnia, antidepressant use, and childhood neurodevelopmental disorders [12]. The long term prognosis of isolated childhood or adolescent onset RBD is unknown. In adult cases of RBD occurring before the age of 50, phenoconversion to neurodegenerative disease is thought to be lower at 12% for men and 5% for women [1]. However, the short length of follow up of existing studies would limit accuracy of conversion rates, which is likely to be an underestimation. In individuals with a long history of RBD but without an established neurodegenerative disorder, prodromal markers of PD are frequently present [13]. Our case highlights the need for longitudinal studies to clarify the risk of future neurodegeneration in adolescent and adult young-onset RBD in the context of POD.

In conclusion, this case describes a patient with presumptive POD with adolescent-onset presumed RBD with frequent dream enactment behavior developing PD after a prolonged latency of 48 years. Adolescent-onset RBD or POD may also be associated with increased neurodegenerative risk and more longitudinal studies are required to clarify the long-term risk of these disorders.

Disclosures

Financial disclosure statements have been obtained, and no conflicts of interest have been reported by the authors or any individuals in control of the content of this article.

Conflict of interest

The ICMJE Uniform Disclosure Form for Potential Conflicts of Interest associated with this article can be viewed by clicking on the following link: https://doi.org/10.1016/j.sleep.2019.01.041.

References

[1] Ju YE, Larson-Prior L, Duntley S. Changing demographics in REM sleep behavior disorder: possible effect of autoimmunity and antidepressants. Sleep Med 2011;12(3):278–83.
[2] Olson EJ, Boeve BF, Silber MH. Rapid eye movement sleep behaviour disorder: demographic, clinical and laboratory findings in 93 cases. Brain 2000;123(Pt 2):331–9.
[3] Iranzo A, Fernandez-Arcos A, Tolosa E, et al. Neurodegenerative disorder risk in idiopathic REM sleep behavior disorder: study in 174 patients. PLoS One 2014;9(2):e89741.
[4] Claassen DO, Josephs KA, Ahlskog JE, et al. REM sleep behavior disorder preceding other aspects of synucleinopathies by up to half a century. Neurology 2010;75(6):494–9.
[5] Schenck CH, Boyd JL, Mahowald MW. A parasomnia overlap disorder involving sleepwalking, sleep terrors, and REM sleep behavior disorder in 33 polysomnographically confirmed cases. Sleep 1997;20(11):972–81.
[6] Dumitrascu O, Schenck CH, Applebee G, et al. Parasomnia overlap disorder: a distinct pathophysiologic entity or a variant of rapid eye movement sleep behavior disorder? A case series. Sleep Med 2013;14(11):1217–20.
[7] Rye DB, Johnston LH, Watts RL. Juvenile Parkinson's disease with REM sleep behavior disorder, sleepiness, and daytime REM onset. Neurology 1999;53(8):1868–70.
[8] Bonakis A, Howard RS, Ebrahim IO. REM sleep behaviour disorder (RBD) and its associations in young patients. Sleep Med 2009;10(6):641–5.

[9] Zhou J, Liang B, Du L. A patient with childhood-onset aggressive parasomnia diagnosed 50 years later with idiopathic REM sleep behavior disorder and a history of sleepwalking. Clin Neurol Neurosurg 2017;160:105–7.
[10] Oudiette D, Leu S, Pottier M. Dreamlike mentations during sleepwalking and sleep terrors in adults. Sleep 2009;32(12):1621–7.
[11] Bhat S, Chokroverty S, Kabak B. Dream-enacting behavior in non-rapid eye movement sleep. Sleep Med 2012;13(4):445–6.
[12] Lloyd R, Tippmann-Peikert M, Slocumb N. Characteristics of REM sleep behavior disorder in childhood. J Clin Sleep Med 2012;8(2):127–31.
[13] Iranzo A, Stefani A, Serradell M. Characterization of patients with long-standing idiopathic REM sleep behavior disorder. Neurology 2017;89(3):242–8.