

# REM BEHAVIOR DISORDER AS A MARKER OF NEURODEGENERATION

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## Background

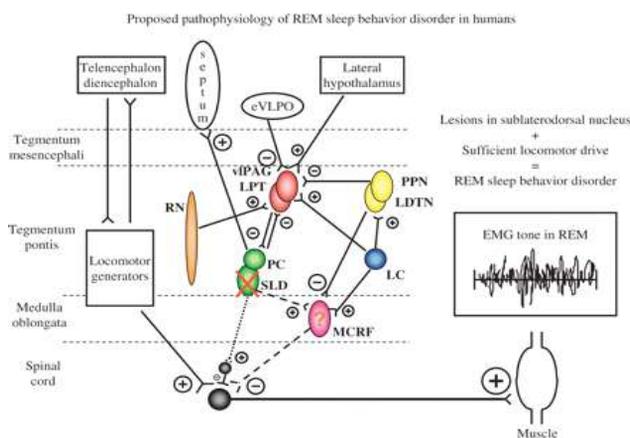
- Rapid eye movement (REM) sleep behavior disorder (RBD) is a sleep disorder characterized by enacting one's dreams during the REM sleep, with most of the dreams being violent or aggressive, so that patients often complain to hurt themselves or bed partner during these episodes
- RBD may herald the emergence of synucleinopathies by decades, such that it may be used as an effective early marker of neurodegenerative diseases, precisely synucleinopathies
- Lesion or dysfunction in REM sleep and motor control circuitry in pontomedullary structures cause RBD phenomenology, and degeneration of these structures might explain the presence of RBD years or even decades before the onset of Parkinson's disease (PD) or dementia with Lewy bodies (DLB) and multiple system atrophy (MSA)

## Epidemiology

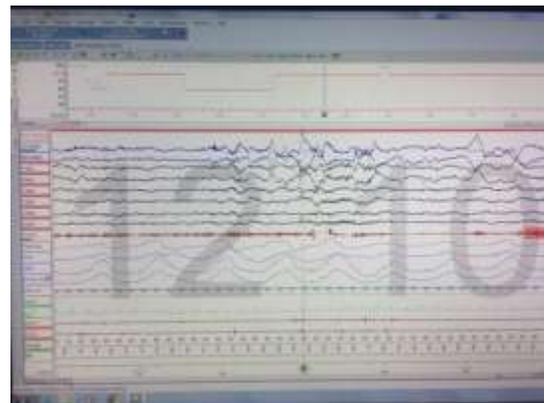
- Prevalence of RBD, based on population, is 0.38-2.01 %, but much higher in patients with neurodegenerative diseases, especially synucleinopathies
- RBD occurs in 30-50 % of patients with sporadic PD, preceding the onset of parkinsonism by several years in about 20 % of them (1)
- The majority of patients with MSA have RBD, recent meta-analysis reported prevalence of clinically suspected RBD in MSA of 73 %, while polysomnographically confirmed RBD was up to 88 % (2)
- RBD is recognized as one of the core features of DLB and may occur either in advance or simultaneously with the onset of DLB. The prevalence of RBD in DLB is up to 76 % (3)

## Clinical picture and diagnosis

- On polysomnography RBD is presented as repeated episodes of vocalization and/or complex motor behaviors during REM sleep which reflects the loss of normally present atonia in REM (i.e. REM sleep without atonia - RSWA)
- Sometimes when typical behaviors are not seen in polysomnography but are known to exist based on medical history, even the presence of RSWA is sufficient to diagnose patients with RBD
- In cases of idiopathic RBD, precisely those patients who at the time of diagnosis don't exhibit clinical signs of PD, DLB or MSA, the treatment is mainly symptomatic
- Treatment is based on lowering motor activity in sleep, promoting sleep continuity and readdressing sleep desynchronization
- Clonazepam and melatonin are main substances used in treatment



Proposed pathophysiology of REM sleep behaviour disorder in humans. *Brain*, Volume 130, Issue 11, November 2007, Pages 2770–2788.



Polysomnography of a 70-year old male patient with symptoms of RBD done in Center for Sleep Disorders. REM sleep without atonia (RSWA) is shown on a 30 sec epoch during which patient manifests only few stereotyped movements of right arm.

## Conclusion

- REM behavior disorder is a parasomnia characterized by the loss of normal skeletal muscle atonia during REM sleep with prominent motor activity accompanying dreaming
- There is a defined association of RBD and neurodegenerative disorders, especially synucleinopathies
- While there is not known effective neuroprotective substance yet, it is important to recognize these parasomnias as they can precede typical motor and cognitive symptoms of neurodegenerative disorders for many years

Literature: 1. Gagnon JF, Bedard MA, Fantini ML, Petit D, Panisset M, Rompre S, Carrier J, & Montplaisir J (2002) REM sleep behavior disorder and REM sleep without atonia in Parkinson's disease. *Neurology*, 59, 585-589.  
 2. Palma J-A, Fernandez-Cordon C, Coon EA, Low PA, Miglis MG, Jaradeh S, et al. Prevalence of REM sleep behavior disorder in multiple system atrophy: a multicenter study and meta-analysis. *Clin Auton Res*. 2015;25:69–75.  
 3. McKeith I. G., Boeve B. F., Dickson D. W., et al. Diagnosis and management of dementia with Lewy bodies: fourth consensus report of the DLB Consortium. *Neurology*. 2017;89(1):88–100.