Chronic pain in individuals with Idiopathic Rapid Eye Movement Sleep Behaviour Disorder: a multi-center study

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Objective: to investigate the prevalence and quality of chronic pain in a cohort of individuals with Idiopathic Rapid Eye Movement (REM) Sleep Behaviour Disorder (iRBD).

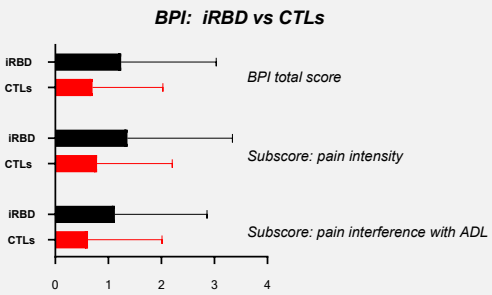
Materials and Methods: N=80 PSG-proven iRBD and N=80 Healthy Control (CTL) subjects were enrolled from 2022 to 2024 at IRCCS Mondino-Pavia, IRCCS San Raffaele-Milan and IRCCS San Martino-Genoa. Clinical and demographic features were collected. The intensity of chronic pain and its interference with daily life were assessed through the Brief Pain Inventory (BPI) scale. A clinically relevant pain was defined by a score >3 on the BPI-*pain intensity* subscale.

Table 1. Differences in RBDs and CTLs populations.

	iRBD n=80	**CTLs** n=80	P value
Demographic and Clinical Features			
Age	69.3 (8.5)	69.1 (9.3)	
Sex	**M** 68, 85.0% **F** 12, 15%	**M** 68, 85.0% **F** 12, 15%	
Disease Duration - years	1.2 (±1.7)	-	
MDS-UPDRS-part III	1.1 (±1.7)	-	
MoCA	27.2 (±2.9)	-	
BDI			
-Total score	7.0 (±5.6)	7.2 (±4.6)	0.771
-Above the cut-off for Depression (n, %)	22, 27.6%	11, 28.9%	0.652
Hyposmia (yes, %)	30, 37.5%	-	-
Orthostatic Hypotension (yes, %)	12, 15.0%	-	-
Constipation (yes, %)	32, 40.0%	-	-
Sleep Assessment			
RBDQ-HK	32.0 (±25.7)	-	
ESS			
-Total score	5.7 (±3.4)	4.8 (±3.2)	0.109
-Above the cut-off for Diurnal Sleepiness (n, %)	12, 15.6%	5, 6.4%	0.068
SCI			
-Total score	21.3 (±5.1)	25.5 (±6.4)	**<0.001**
-Below the cut-off for Insomnia (n, %)	15, 18,7%	6, 7,7%	**0.0044**
PSQI			
-Total score	6.7 (±3.6)	4.0 (±2.9)	**<0.001**
-Above the cut-off for Bad Sleep Quality (n, %)	52 (66.3%)	17 (21.3%)	**<0.001**
Pain Assessment (BPI score)			
-Total score	1.2 (±1.8)	0.7 (±1.3)	**0.008**
-Subscore: pain intensity	1.3 (±1.9)	0.7 (±1.4)	**0.036**
-Subscore: interference of pain with daily life	1.1 (±1.7)	0.6 (±1.3)	**0.044**
- Clinically relevant pain (BPI pain intensity >3)	14, 17.5%	7, 8.8%	0.101

Results: iRBD and CTLs were homogeneous as for age and sex. Disease duration in iRBD was 1.2±1.7 years. iRBD subjects did not show either motor or cognitive impairment. The prevalence of depression was similar in both groups. iRDB subjects showed higher frequency of insomnia and bad sleep but did not experience greater diurnal somnolence compared to CTLs. Individuals with iRBD scored higher on BPI than CTLs (BPI total score: iRBD, 1.2±1.8 vs CTL, 0.7±1.3, p=0.008; BPI-*pain intensity*: iRBD, 1.3±1.9 vs CTL, 0.7±1.4, p=0.036; BPI-*interference of pain with daily life*, iRBD, 1.1±1.7 vs CTL, 0.61.3, p=0.044). However, the prevalence of clinically relevant pain was similar between groups (iRBD, 17.5% vs CTL, 8.8%, p=0.101). iRBD subjects with pain were more depressed than those without (iRBD with pain, 53.8% vs iRBD without pain, 22.2%, p=0.022).

Figure 1. Differences in BPI score between iRBD (black) and CTLs (red) in BPI total score and the subscores of pain intensity and pain interference with ADL. The boxes indicate the mean value while the whiskers indicate the standard deviation.



Discussion: neurodegenerative changes may alter pain processing at both central and peripheral level resulting in chronic pain. While several reports have established that the prevalence of chronic pain in Parkinson's Disease (PD) ranges from 40 to 88%, no studies have been conducted yet on the pre-motor phases of disease, i.e. iRBD. Here, we found no significant difference in clinically relevant pain between newly-diagnosed iRBD and CTLs. However, the iRBD group scored higher on the BPI scales, suggesting that some subclinical alterations in pain perception might precede the onset of overt synucleinopathy.

Conclusions: although no significant association between chronic pain and iRBD emerges, subtle alterations in pain perception may be detectable in individuals at risk of conversion to synucleinopathies. These results warrant continued data collection to expand our sample size and provide comprehensive characterization of type and quality of pain.

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