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Internal Consistency of the University of Michigan RBD Questionnaire

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The presence of REM Behavior Disorder (RBD) has been shown to predict later development of Parkinsonism, and several questionnaire approaches [1–3] have been devised to collect spouse/caregiver reported data on such dream enactment behavior. The University of Michigan RBD Questionnaire (UMRBDQ) was developed a number of years ago [1] and has seen only sporadic use. The scale is composed of seven items. Each item is scored on a proportional basis (range: 0.0 – 1.0) and a mean item score is computed, which constitutes the patient's total score. We report here data suggesting very high internal consistency of this short scale, its utility in differentiating the conditions across the synucleinopathic spectrum, and its sensitivity/specificity in distinguishing synucleinopathic conditions versus neurologically normal subjects.

Caregivers or spouses of 72 patients [55 idiopathic Parkinson's disease (IPD); 12 Dementia with Lewy Bodies (DLB); 5 idiopathic RBD (IRBD)] completed the UMRBDQ and were rated on Unified Parkinson's Disease Rating Scale (UPDRS) (motor subscale) by a movement disorders specialist. Controls (n = 15) were derived from a community-based movement disorders screening day; all were administered the UPDRS. Among controls, 7 self-completed the UMRBDQ, but mean values did not differ from 8 with spouse-completion. All protocols were IRB-approved. Demographics and clinical information are shown in Table 1 and indicate that both IPD and DLB patients had significantly greater motor impairment relative to controls and IRBD. None of the controls and a very small number of IRBD received dopaminergic medications. Mean (standard deviation) levo-dopa and pergolide dose equivalence for the IPD patients was 320.1 (332.5) mg and 1.24 (1.56) mg, respectively. Mean (SD) UMRBDQ score was .34 (.25). Cronbach's alpha for the seven items on the UMRBDQ was .858, suggesting that all were highly reliable with each other, i.e., dream enactment could be encompassed as a single trait. Reported dream enactment varied across group (F = 149.66, df 3, 83, p < .001) (see Figure 1) with controls being significantly lower than IPD, DLB and IRBD and IRBD significantly higher than IPD. UMRBDQ score was associated with the patient's own reported experience of vivid dreaming (rho = .39, p < .001) and nightmares (rho = .35, p = .001) collected from a separate

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questionnaire given to the patients [4, 5]. After controlling for demographics, diagnosis, UPDRS score, years since diagnosis, levo-dopa equivalence and dopamine agonist equivalence, 24% of remaining variance ($p < .001$) in the UMRBDQ could be accounted for by the patient's own reports of vivid dreaming and nightmares. Use of a UMRBDQ cutpoint score of $\geq .30$ resulted in relatively high specificity (80.0%) for differentiating controls from each of the three groups. Sensitivities were 49.1% for IPD ($p = .044$), 83.3% for DLB ($p = .001$) and 100% for IRBD ($p = .002$).

Assessment of dream enactment by history is a challenging task in the exam setting and may be enhanced by polysomnography [6–9], but standardized questionnaires such as the UMRBDQ are a quick way to appreciate this important and potentially prognostic sign. The high inter-item consistency suggests that perhaps even a single question might be of value. In situations where a caregiver/spouse may not be available, the patient's own report of their experiences may also represent an important corroborating source of data.

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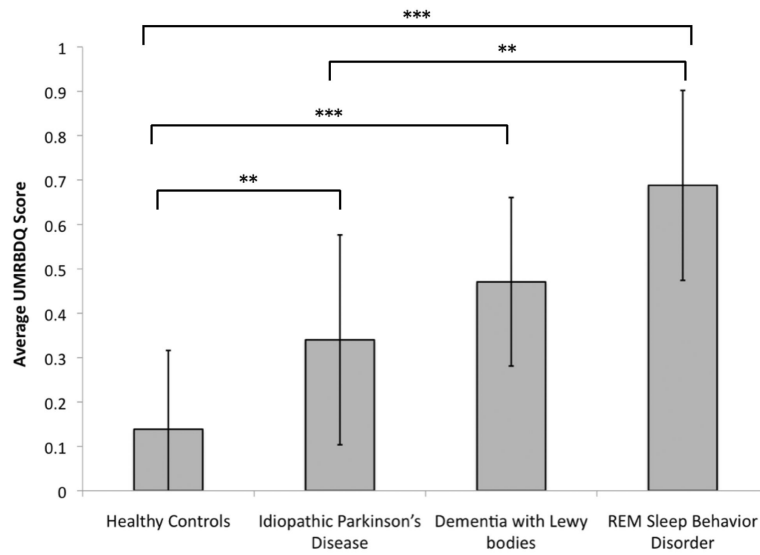


Figure 1.

Bar graph showing mean and standard deviation for UMRBDQ score for each of the 4 groups. Horizontal lines reflect statistically significant pairwise differences between groups.

*** $p < .001$; ** $p < .005$

Table 1

Demographic and clinical data across groups (A-D). Mean and standard deviations are shown. Significant ($p < .05$) pairwise comparisons are indicated under inferential statistics. Corrected p values were used when Levene's Test for Inequality of Variances was significant.

	Healthy Controls (A)	Idiopathic Parkinson's Disease (B)	Dementia with Lewy bodies (C)	REM Sleep Behavior Disorder (D)	Inferential Statistics
Age	61.3 (12.1)	63.8 (9.0)	71.2 (7.1)	69.0 (11.3)	$F=3.05, p=.033; A<C, B<C$
Sex (% Female)	66.7	30.9	8.3	20.0	$X^2=11.42, p=.009; A>B, A>C$
UPDRS motor	1.7 (1.8)	19.2 (8.7)	23.1 (12.4)	4.2 (1.8)	$F=23.51, p<.001; A<B, A<C, A<D, B>D, C>D$
Years Since Diagnosis	N/A	5.5 (3.8)	3.0 (1.4)	5.9 (4.0)	$F=2.59, p=.083$
L-dopa (% taking medication)	0	61.82	41.67	20.00	$X^2=19.77, p<.001; A<B, A<C$
Dopamine agonist (% taking)	0	45.45	8.33	20.00	$X^2=15.27, p=.001; A<B, B>C$