

Brain Metabolism Related to Mild Cognitive Impairment and Phenoconversion in Patients With Isolated REM Sleep Behavior Disorder



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Neurology® 2022;98:e2413-e2424. doi:10.1212/WNL.0000000000200326

Objectives: To identify 1) brain metabolism and functional connectivity changes related to MCI in patients with iRBD, and 2) predictors of phenoconversion

Approach: Prospective cohort study of iRBD (with vs. without MCI), compared to healthy controls, using baseline ¹⁸F-fluorodeoxyglucose (FDG)-PET and resting-state fMRI. Participants were followed (mean 4.2 ± 2.6 years) to monitor for phenoconversion to PD/DLB/MSA

Participants

- 40 iRBD → iRBD-MCI (n=21), iRBD-NC (n=19)
- 24 sex- and age-matched healthy controls



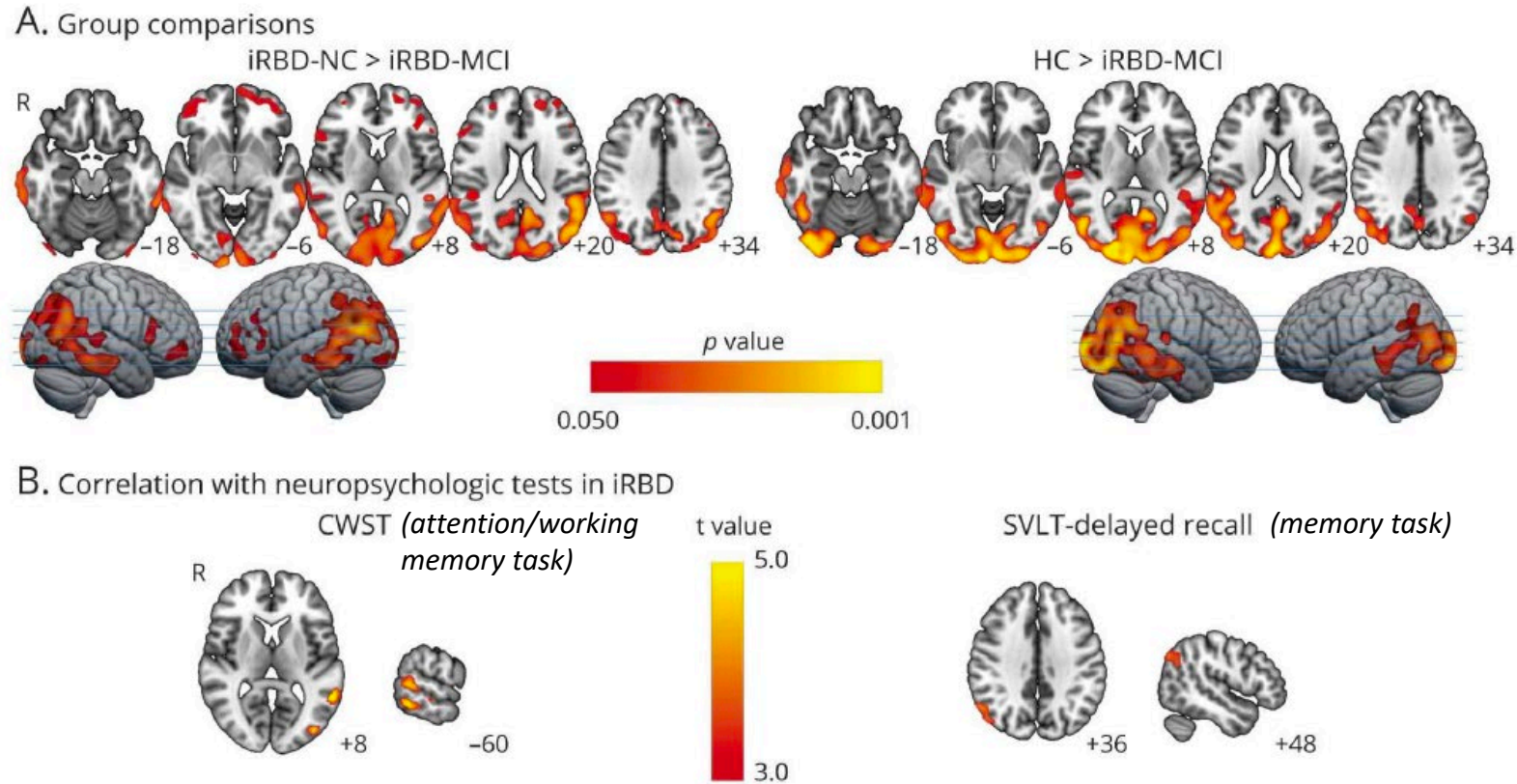
Table 1 Demographic and Clinical Characteristics of Participants at Baseline

	Healthy controls	iRBD-NC	iRBD-MCI	p Value
FDG-PET				
N	24	19	21	
Age, y	69.5 ± 4.3 (58–78)	69.1 ± 5.2 (62–78)	70.5 ± 5.8 (58–80)	0.645
Sex, F:M	17:7	9:10	10:11	0.190
Education, y	11.1 ± 3.4 (5–18)	9.4 ± 5.2 (0–16)	8.7 ± 4.9 (1–18)	0.213
MMSE	28.5 ± 1.5 (24–30)	27.7 ± 2.1 (23–30)	26.6 ± 2.5 (23–30)	0.017 ^a Sig for iRBD-MCI vs. HC
RBD duration, y		5.8 ± 4.9 (1–23)	4.0 ± 2.6 (1–10)	0.164
MDS-UPDRS-I		7.3 ± 4.0 (0–14)	9.7 ± 6.9 (2–29)	0.199
MDS-UPDRS-II		2.7 ± 3.2 (0–12)	5.3 ± 4.5 (0–17)	0.047
MDS-UPDRS-III		3.9 ± 3.2 (0–13)	8.3 ± 5.5 (0–18.5)	0.004
MPS		4 (21.1)	9 (42.9)	0.141

- On neuropsych testing, iRBD-MCI group with **significantly lower performance** in attention/working memory, executive function, and memory, compared to iRBD-NC and HC

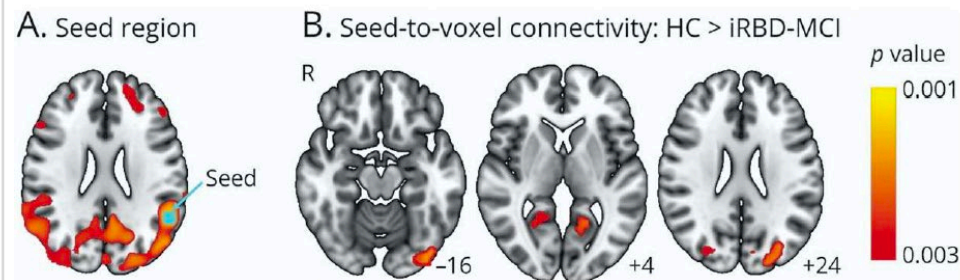
Brain metabolic changes

Figure 1 Brain Glucose Metabolism in Patients With iRBD Associated With Their Cognitive Function



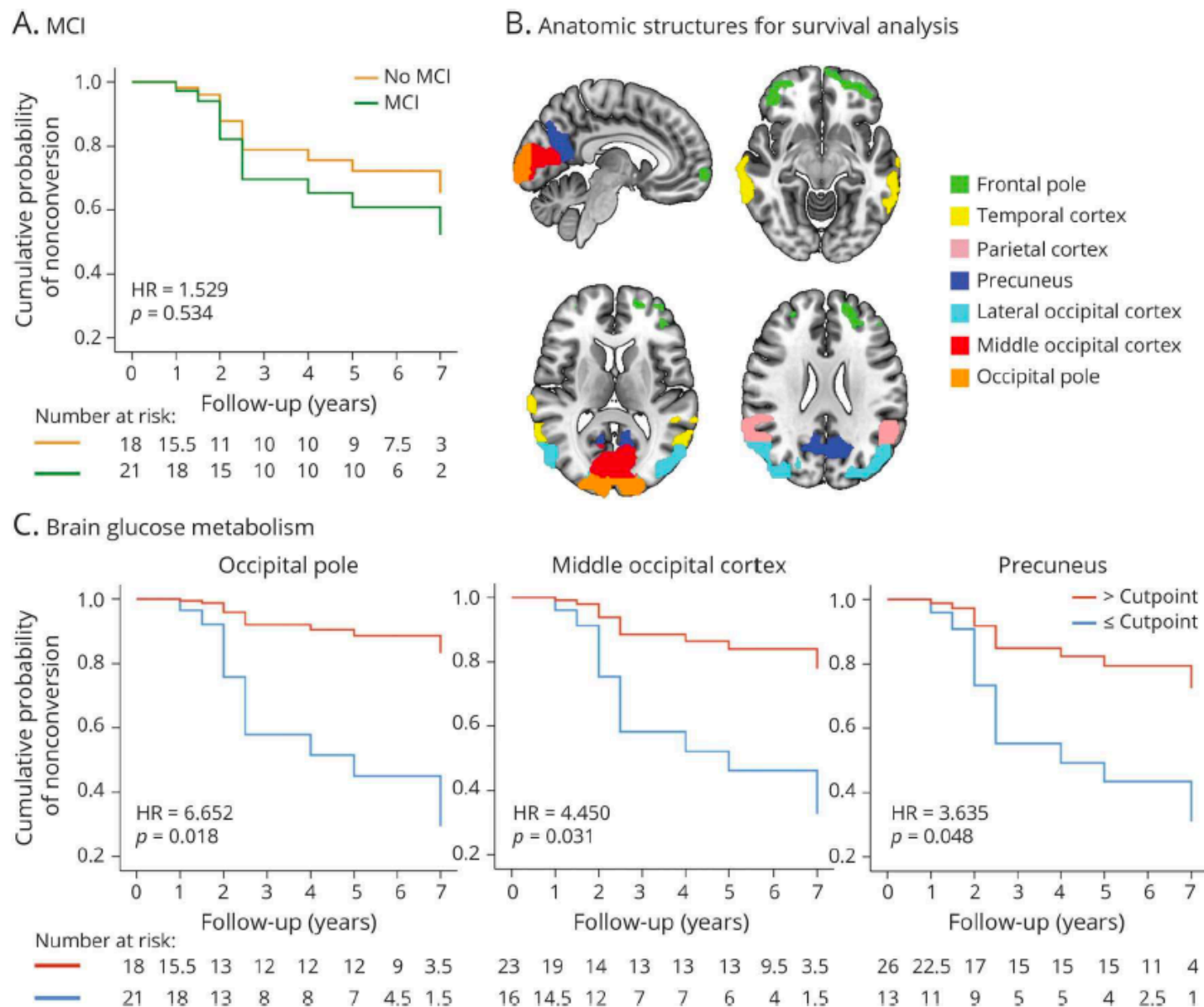
Functional connectivity changes

Figure 2 Group Differences in Functional Connectivity of the Left Angular Gyrus



Prediction of phenoconversion

Figure 3 Survival Curves of Phenoconversion to Parkinson Disease or Dementia With Lewy Bodies



- Total 12 phenoconverters
 - 5 from iRBD-NC group (1 DLB, 3 PD, 1 MSA)
 - 7 from iRBD-MCI group (3 DLB, 4 PD)

Table 4 Baseline Characteristics of iRBD Converters and Nonconverters

	Nonphenoconverters	Phenoconverters	p Value
N	28	12	
Age, y	69.0 ± 5.8	71.8 ± 4.4	0.152
Sex, F:M	15:13	4:8	0.311
Education, y	9.1 ± 5.3	8.8 ± 4.4	0.822
MMSE	27.1 ± 2.4	27.2 ± 2.2	0.942
RBD duration, y	5.3 ± 4.5	4.0 ± 2.2	0.363
MDS-UPDRS-I	8.4 ± 6.5	8.8 ± 3.7	0.841
MDS-UPDRS-II	4.0 ± 4.4	4.3 ± 3.5	0.862
MDS-UPDRS-III	5.6 ± 4.9	7.7 ± 5.2	0.238
MPS	9 (32.1)	4 (33.3)	0.941
MCI	14 (50.0)	7 (58.3)	0.736
Follow-up, y^a	4.6 ± 2.7	2.9 ± 1.7	0.019