The Free and Cued Selective Reminding Test distinguishes dementia with Lewy bodies from Alzheimer's disease in the early stage

Cinzia Bussè[1,2], Giulia Camporese[2], Alice Rossi[2], Giovanni Zorzi[2], Federica Fragiacomo[2], Paolo Caffarra[3], Annachiara Cagnin [1,3]

[1] Department of Neurosciences, Psychology, Pharmacology and Child Health, NEUROFARBA, University of Florence
[2] Department of Neurosciences, University of Padova, Padova, Italy
[3] Department of Medicine and Surgery, University of Parma, Parma, Italy
4IRCCS San Camillo, Hospital Venice, Venice, Italy

Objective

To comprehend the efficacy of the **Free and Cued Selective and Reminding test (FCSRT)** in differentiating patients with mild cognitive impairment converting to dementia with Lewy bodies (**MCI-DLB**) from patients with MCI due to Alzheimer's disease (**MCI-AD**).

Materials and methods

Thirty-five participants with MMSE≥26 were included in the study. Fifteen were ultimately diagnosed as probable DLB (**MCI-DLB: n=15**) and twenty as probable AD (**MCI-AD: n=20**) according to current criteria (Ferman et al. 2013; Albert et al. 2011) after three years of follow-up. At baseline patients underwent a **comprehensive cognitive evaluation including the FCSRT** for the assessment of episodic memory.

Characteristics of the population are shown in **Tab. 1**.

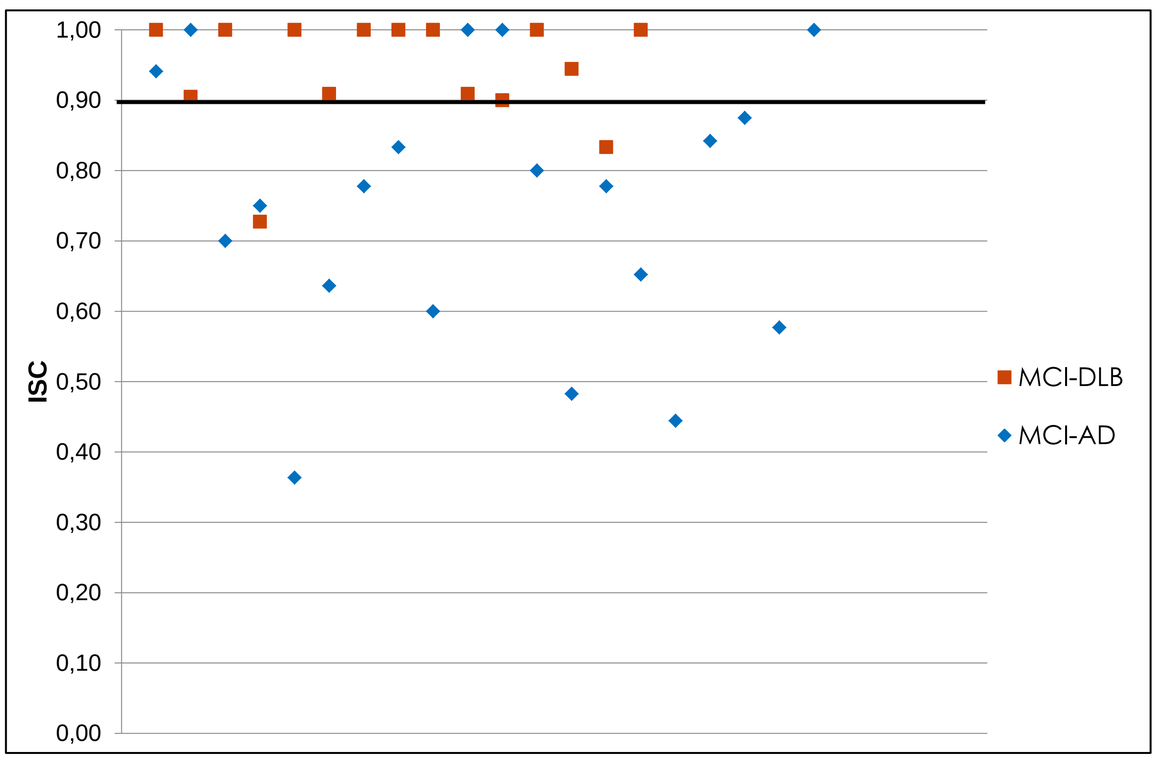
Results

In the FCSRT, MCI-DLB performed better than MCI-AD at the Immediate Total Recall **(ITR)** (DLB=35.13±1.26; AD=29.95±1.08, p=0.01) and at the **Index of Sensitivity of Cueing** (**ISC**; **Fig. 1, 2**) (DLB=0.94±0.04; AD=0.76±0.04, p<0.001). Moreover, MCI-DLB performed worse than MCI-AD in the **digit cancellation task** (DLB=45.49±1.43; AD=49.83±1.22; p=0.03), **number of angles of the MMSE pentagons copy** (DLB=3.11±0.17; AD=3.72±0.15; p=0.01) and **Rey figure copy** (DLB=23.77±1.47; AD= 27.90±1.26; p= 0.05). Scores of the neuropsychological tests are shown in **Tab. 2**.

Tab 1. Characteristics of the population (Bold * p values indicate statistical significance)

Demographics	MCI-DLB (n=15)	MCI-AD (n=20)	*p*
Gender (m/f)	7/8	9/11	0.92
Age	74.60±4.26	69.55±10.08	0.05
Education	10.20±4.13	12.45±4.02	0.12
MMSE (M ± SE)	26.80 ± 1.27	27.15 ± 1.39	0.44
VH	54.5%	0.0%	**0.00 ***
Parkinsonism	63.6%	0.0%	**0.00 ***
Cognitive fluctuations	63.6%	0.0%	**0.00 ***

Fig 2. Distribution of Index of Sensitivity of Cueing (ISC) values in MCI-DLB and MCI-AD.
ISC cut-off of normality< 0.90



Tab 2. Neuropsychological tests of patients with MCI-DLB and MCI-AD (Bold * p values indicate statistical significance)

Cognitive tests		MCI-DLB (n=15) M ± SE	MCI-AD (n=20) M ± SE	*p*
MMSE (raw score)		26.80 ± 1.27	27.15 ± 1.39	0.44
QSPT (Number of angles)		3.11 ± 0.17	3.72 ± 0.15	**0.01 ***
Attentional Matrices		45.49 ± 1.43	49.83 ± 1.22	**0.03 ***
Trail making test A, s		90.47 ± 9.99	67.65 ± 8.57	0.10
Fluency				
	Phonemic	29.06 ± 2.48	31.48 ± 2.18	0.49
	Semantic	32.99 ± 2.75	31.70 ± 2.42	0.74
Digit span				
	Forward	5.52 ± 0.28	5.31 ± 0.24	0.59
	Backward	3.68 ± 0.26	3.49 ± 0.22	0.61
Prose memory				
	Immediate recall	9.11 ± 1.19	7.49 ± 1.12	0.35
	Delayed recall	9.19 ± 1.40	7.95 ± 1.31	0.54
ROCF				
	Copy	23.77 ± 1.47	27.90 ± 1.26	0.05
	Delayed recall	9.98 ± 1.56	8.32 ± 1.34	0.44
Clock drawing		6.47 ± 0.84	7.42 ± 0.76	0.43
FCSRT				
	IFR	22.47 ± 2.04	18.14 ± 1.75	0.13
	ITR	35.13 ± 1.26	29.95 ± 1.08	**0.01 ***
	DFR	7.46 ± 1.02	5.56 ± 0.87	0.18
	DTR	11.24 ± 0.52	10.02 ± 0.45	0.10
	ISC	0.94 ± 0.04	0.76 ± 0.04	**0.00 ***

MMSE: Mini Mental State Examination; QSPT: Qualitative Scoring Pentagon Test; ROCF: Rey-Osterrieth Compex Figure; FCSRT: Free and Cued Selective Reminding Test; IFR: Immediate Free Recall; ITR: Immediate Total Recall; DFR: Delayed Free Recall; DTR: Delayed Total Recall; ISC: Index of Cues Sensitivity.

Discussion

At **early stages DLB** showed to benefit more than AD from the controlled learning through category cues, exhibiting a **greater ISC**. Deficit of memory consolidation is characteristic of MCI-AD while in MCI-DLB memory difficulties result from **ineffective recall strategies in controlled encoding conditions**. Poorer performances in attentive and visuo-constructional tasks in DLB respect to AD were confirmed even at the MCI stage.

Conclusion

The **FCSRT** can be used to distinguish between **DLB** and **AD at early stages.**

***Acknowledgements: The current work is supported by* AIRAlzh Onlus-COOP Italia**