Montreal Cognitive Assessment (MoCA) Performance and Domain-Specific Index Scores in Amnestic Versus Aphasic Dementia

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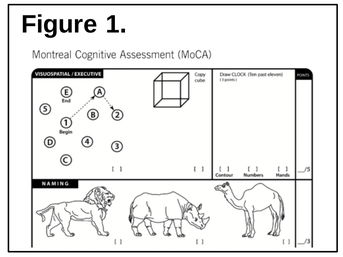
INTRODUCTION

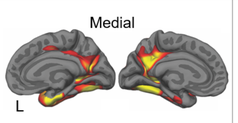
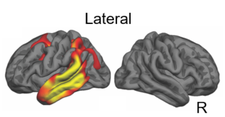
- The Montreal Cognitive Assessment (MoCA) (Nasreddine et al., 2005) is a popular screening tool developed to detect cognitive impairment and dementia (**Figure 1**).

Figure 1.



- The MoCA total score (possible /30) is comprised of six domain-specific Index scores: Memory (MIS), Executive (EIS), Attention (AIS), Language (LIS), Visuospatial (VIS), and Orientation (OIS).
- It remains unclear whether Index scores can differentiate among dementia syndromes.
- This study investigated differences between MoCA Index scores in individuals with mild dementia of the Alzheimer's Type (DAT, amnestic), primary progressive aphasia (PPA, aphasic), and in normal controls (NC). See below for differences between DAT and PPA at initial diagnosis.

DAT vs. PPA at Initial Diagnosis

Cognitive Domain	Dementia of the Alzheimer's Type (DAT)	Primary Progressive Aphasia (PPA)[+]
Memory	Impaired	Spared
Language	Typically spared	Impaired
Other	Impairment in at least one other domain	Spared
Atrophy Patterns		

Atrophy in PPA typically favors left-hemispheric language regions, including temporal cortical areas (shown above in lateral views), while atrophy in DAT is typically localized to bilateral medial temporal regions (above, medial view).

[+]Based on criteria from Mesulam, M. (2001). Primary progressive aphasia. *Annals of Neurology*, *49*(4), 425-432.

METHODS

- Total MoCA scores and Index scores were calculated from baseline administration in patients followed longitudinally at the Northwestern Alzheimer's Disease Center.
- The PPA diagnosis was based on the criteria of Mesulam, 2001. The DAT diagnosis was based on CERAD criteria (Morris et al., 1989) and patients were required to score ≤ 1 on the CDR and show mild impairment on the Activities of Daily Living Questionnaire (ADL-Q). See **Table 1.**
- ANOVAs adjusted for age followed by posthoc pairwise comparisons with Bonferroni corrections were used to compare MoCA total and Index scores among the three groups.

Table 1. Group Information (mean score; SD)

	DAT	PPA	NC
N	33	37	83
Age (y)	76.12 (9.86) [a]	64.97 (6.65) [a,b]	75.87 (9.95)
Education (y)	16.00 (2.85)	16.27 (2.38)	16.89 (2.34)
Gender (% male)	42%	54%	30%
Age at Onset (y)	70.89 (9.35)	61.35 (7.01)	N/A
ADL-Q (%)	29.39 (14.12) [a]	13.89 (7.70) [a]	N/A
Global CDR	0.79 (0.25)	0.24 (0.25)	0.00 (0.00)

[a]Significant differences between DAT and PPA groups at $p < 0.05$;
[b]Significant differences compared to NC at $p < 0.05$

RESULTS

- MoCA total scores were significantly lower for each patient group compared to controls ($p < 0.001$).
- DAT total scores were not significantly different compared with the PPA group.

Funding: NIA/NIH P30 AG013854
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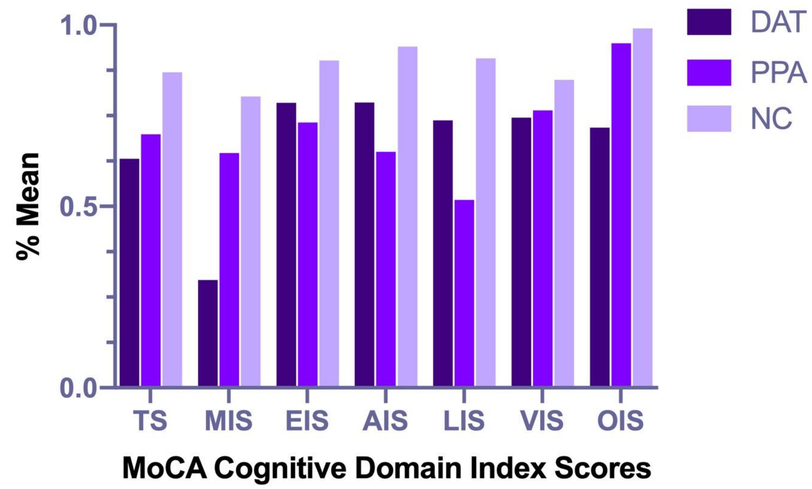
RESULTS Cont.

- DAT patients scored significantly lower on Memory and Orientation Index scores compared to normal controls and PPA patients ($p < 0.001$).
- PPA patients scored significantly lower in Language and Attention Index scores compared to both other groups ($p < 0.001$) (**Figure 2**).

Figure 2.



CONCLUSIONS

- MoCA Index scores can distinguish between amnestic and aphasic dementia phenotypes despite no difference in MoCA total score.
- MoCA Index scores can be used to assist in diagnosis and help guide patients into appropriate clinical trials or treatments.

REFERENCES

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The MoCA test image was obtained freely from www.mocatest.org.

Images of atrophy provided by: Martersteck, A., and Rogalski. E.