Multiple System Atrophy: cognitive impairment and comparison to Parkinson's Disease

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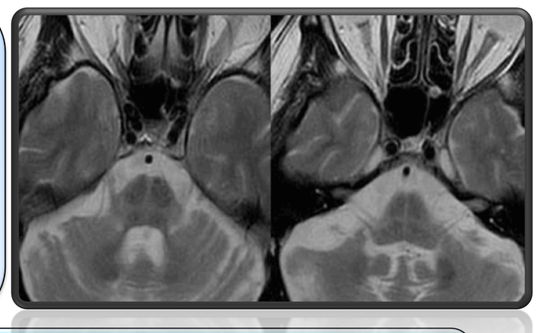
Multiple System Atrophy

- neurodegenerative disorder
- parkinsonism
- cerebellar impairment
- autonomic dysfunction



COGNITIVE IMPAIRMENT (CI) COULD BE A CONSISTENT MSA FEATURE?

MSA AND PD PATIENTS HAVE DIFFERENT COGNITIVE ABILITIES?

10 Multiple System Atrophy (MSA) patient

10 Parkinson disease (PD) patients

10 healthy controls (HC)

- **Pata Rate**
- **9 Hole Pegboard Test**

Neuropsychological battery
Global Evaluation: Montreal Cognitive Assessment
Language: Naming nouns and Pointing
Intelligence: Raven's Colored Progressive Matrices
Executive Function: Symbol Digit Modalities Test, Trail Making Test, Phonemic and Semantic fluencies, Attentional Matrices
Memory: Digit span, Modified 10/36 spatial recall test, Rey's auditory verbal learning test
Visuospatial Function: Segment length discrimination, Mental rotation

MSA, PD and HC were comparable for age, sex distribution, and education

MSA
MoCA (p=0.002),
Ray's short term memory (p=0.004)
Semantic fluencies (p=0.014)
Attentional Matrices (p=0.01)
Trail Making Test B (p=0.030)
Symbol Digit Test (p=0.006)

HC

MSA PATIENTS SHOWED A RELEVANT CI CONCERNING EXECUTIVE FUNCTIONS, SHORT-TERM MEMORY, AND GLOBAL FUNCTIONING

MSA
MoCA (p=0.046)

PD

AT GLOBAL ASSESSMENT MSA SHOWED GRATER CI THAN PD.

PD
Symbol Digit Test (p=0.008)

HC

PD PATIENTS, DESPITE A LONG PERIOD OF ILLNESS, HAVE LIMITED CI IMPAIRMENT, WITH EXCLUSIVE ALTERATION OF THE SYMBOL DIGIT MODALITIES TEST

Test	K-W (p)	HC	MSA	CNTRL vs MSA (p)	PD	CNTRL vs PD (p)	MSA vs PD (p)
Moca	**0,002**	24,9±2,8	19,1±3,2	**0,004**	22,3±2,5	0,144	**0,044**
Raven	0,148	29,9±3,2	24,6±9,9	NP	24,1±6,6	NP	NP
Naming	0,737	14,3±0,8	14±1,5	NP	13,5±1,7	NP	NP
Pointing	0,317	23,9±0,3	23,6±0,8	NP	24±0	NP	NP
DigitSpan	0,807	5,2±0,8	5,3±0,8	NP	5,1±0,7	NP	NP
ReyImm	**0,011**	39,7±6,4	28,9±5,5	**0,006**	34,8±9	0,258	0,240
ReyDiff	0,594	8,3±3,2	6,6±2,4	NP	7,9±2,9	NP	NP
1036Imm	0,209	20,7±5,1	16,7±5,9	NP	18,7±4,8	NP	NP
1036Diff	0,131	7,4±2,4	5,4±2,6	NP	6,5±1,6	NP	NP
Fonemic Fluency	0,061	38,2±14,9	22,5±12,8	NP	29,2±9,8	NP	NP
Fonemic Fluency Corrected	0,075	38,2±14,9	23,2±13,3	NP	29,2±98	NP	NP
Semantic Fluency Raw	**0,021**	21,725±4,9	14,275±4,3	**0,008**	18,4±6,4	0,380	0,302
Semantic Fluency Corrected	**0,039**	21,7±4,9	14,4±4,8	**0,018**	18,4±6,4	0,380	0,398
Attentional Matrices Raw	**0,001**	55,5±3,9	34,8±16,5	**0,002**	52,6±5,2	0,186	**0,014**
Attentional Matrices Corrected	**0,016**	55,5±3,9	44,7±14,1	**0,012**	52,6±5,2	0,186	0,320
TMT-A	**0,004**	41,5±17,9	108±67	**0,006**	47,5±26	1,000	**0,016**
TMT-A corretta	0,115	56,4±25,2	79,9±35,5	NP	55,0±24,2	NP	NP
TMT-B	**0,001**	104,6±36,2	315,4±134,3	**0,002**	164,4±112,3	0,346	**0,038**
TMT-B corretta	0,500	104,6±36,3	253,1±107,2	NP	164,4±112,4	NP	NP
SDMT	**0,002**	40,5±8,2	24,3±8,7	**0,006**	28,2±8,3	**0,012**	0,424
SDMT corretto	**0,004**	40,5±8,3	25,0±8,9	**0,010**	28,2±8,4	**0,012**	0,614

Comparison between the groups of patients analyzed with the Kruskal-Wallis Test and post-hoc analysis with the mann-Whitney

SD = standard deviation, Moca =Montreal Cognitive Assessment, FF = Fonemic Fluency, FS = Semantic Fluency, MA = Attentional matrix, TMT = Trail Making Test, SDMT = Symbol Digit Modalities Test

	Group (n,%)		
Test	MSA	PD	Control
Immediate Recall	6 (60%)	4 (40%)	1 (10%)
Semantic Fluency Raw	5 (50%)	2 (20%)	0%
Semantic Fluency Corrected	4 (40%)	2 (20%)	0%
Attentional Matrices Raw	5 (50%)	0%	0%
Attentional Matrices Corrected	2 (20%)	0%	0%
Trail Making Test A	6 (60%)	1 (10%)	1 (10%)
Trail Making Test B	7 (70%)	2 (20%)	1 (10%)
Symbol Digit Modalities Test Raw	10 (100%)	7 (70%)	3 (30%)
Symbol Digit Modalities Test Corrected	10 (100%)	7 (70%)	3 (30%)

Number of patients and controls with impaired test results

THESE EVIDENCES RAISE THE POSSIBILITY THAT CI MAY CONTRIBUTE TO THE CLINICAL SPECTRUM OF MSA TO A GREATER EXTENT THAN IT IS CURRENTLY THOUGHT.

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