Cognitive changes in newly diagnosed multiple sclerosis: a two-years follow-up study

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Objectives: cognitive impairment occurs in 40-60% of patients with Multiple Sclerosis. Less is known about the rate and pattern of cognitive decline over the course of the illness. The purpose of this study was to evaluate cognitive changes in newly diagnosed multiple sclerosis two years after time of diagnosis.

Materials and Methods: we enrolled 22 subjects satisfying McDonald 2010 criteria for MS from June 2012 to May 2013 at the Multiple Sclerosis Center of Bergamo. Each patient underwent an extensive neuropsychological evaluation (BRB, MMSE, Clock Drawing, Verbal Fluency, Digit Span, Corsi, EBN, Rivermead Behavioural Memory, TMA, TMB, Stroop, *Attentive Matrices*, Raven's Progressive Matrices, Tower of London, Rey Complex Figure Test, WCST) at a mean of 4.3 months from diagnosis (T0). 14 patients underwent the same cognitive assessment after an interval of two years (T24). All subjects received during this period a disease modifying treatment (DMT).

Results: at 24-months from diagnosis, our cohort showed progression of disability (EDSS: 2.3±1.8 at T24 vs 1.5±0.5, p=0.002). No deterioration of cognitive profile were detected in our sample. We observed even an improvement in several domains (memory, executive functions), but only in the WCST was statistically significant (28.5±11.6 at T24 vs 49.2±28.4, p<0.05) **(Table 1).**

Discussion:
In contrast with previous findings, in our population, cognitive performances didn't deteriorated within the first two years of disease. We hypothesized that emotional impact due to diagnosis and start of new therapies could largely have influenced initial cognitive profile, but also long-term benefits of DMT could have contributed to improvement. Further clinical longitudinal observation and a larger sample are needed to confirm these findings.

Table 1. Clinical-demographic characteristics and neuropsychological profile

	T0 (N=14)				T24 (N=14)				
	%	median	mean	sd	%	median	mean	sd	p value
Age (years)			27.8						
Gender (Female)	71.4								
Education			12.6						
EDSS		1.5	1.5	0.5		2.0	2.3	1.8	0.002
MMSE		30.0	29.5	1.0		30.0	29.2	1.1	0.427
BRB									
SRT-LTS		53.0	52.6	8.1		52.2	53.4	11.6	0.812
SRT-CLTR		39.0	39.2	17.0		45.4	47.2	13.5	0.064
SPART		23.0	21.9	4.7		22.1	21.0	4.8	0.528
SDMT		61.8	59.7	8.8		63.3	61.5	10.9	0.425
PASAT 3		44.5	43.8	7.5		45.8	44.9	5.8	0.183
PASAT 2		34.2	34.6	9.4		35.4	33.4	14.5	0.778
SRT-D		9.1	9.7	1.4		9.9	9.5	1.9	0.773
SPART-D		9.4	8.4	1.9		8.2	7.5	2.4	0.222
WLG		27.9	26.6	5.3		24.9	25.9	5.2	0.392
WCST		39.7	49.2	28.4		29.9	28.5	11.6	0.030
Digit Span forward		5.5	5.5	0.9		6.0	6.0	0.4	0.127
Digit Span backward		5.0	5.4	1.3		5.0	5.3	1.1	0.821
Corsi		5.8	5.6	0.9		4.8	5.4	0.9	0.550
Rivermead1		11.5	11.3	1.0		11.0	11.2	0.9	0.808
Rivermead2		22.0	21.8	1.5		22.0	21.7	1.3	0.886
Tower of London		30.5	30.2	3.9		31.5	30.9	3.4	0.578
Phonemic fluency		37.0	37.8	10.5		41.0	40.4	12.0	0.676
Rey Figure copy		32.0	31.5	2.1		31.1	31.4	1.5	0.925
Rey Figure recall		18.1	16.6	5.7		18.9	17.1	4.6	0.648
Raven's Matrices		32.0	31.7	2.0		32.0	31.4	1.8	0.670
TMTA		33.0	37.0	13.3		36.0	33.5	7.8	0.381
TMTB		95.0	92.8	24.8		80.0	82.3	23.3	0.054
Attentive Matrices 1		10.0	9.8	0.4		10.0	9.9	0.4	0.583
Attentive Matrices 2		38.1	38.2	3.1		38.8	38.1	3.3	0.910
Stroop Test 1		23.0	24.0	5.9		21.4	22.3	6.8	0.153
Stroop Test 2		1.4	1.6	0.5		1.4	1.5	0.5	0.149

References:
Strober L.B., Rao S.M., Lee J., Fisch E., Rudick R. Cognitive impairment in multiple sclerosis: an 18 year follow-up study. Multiple Sclerosis and Related Disorders(2014) 3, 473–481.