

Cognitive and behavioural impact of sleep quality in newly diagnosed multiple sclerosis

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Objective: patients with multiple sclerosis (MS) often have unrecognized sleep disorders, that may contribute to fatigue, one of the major symptoms in all phases of the disease, and impact on the quality of life. However, the exact relationship between sleep quality, fatigue and cognitive function is today poorly understood. The purpose of this study was to compare the neuropsychological profile of newly diagnosed MS subjects with and without sleep complains.

Material and Methods: we enrolled 65 subjects satisfying 2010 revised McDonald criteria from June 2012 to October 2015 at the MS Centre of Bergamo. At a mean time of 4.6 months from diagnosis, each patient underwent a multidimensional assessment comprehensive of neuropsychological tests (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), evaluation of depression, anxiety, sleep, fatigue and quality of life (BDI, STAI-Y, PSQI, ESS, FSS, MSQOL-54), measures of motor function and disability (9HPT, TWT, EDSS). Subjects were classified as good (MS-Sleep-) or bad (MS-Sleep+) sleepers respectively by a PSQI score > or = 5.

Results: thirty-five percent of our patients (N=23) were MS-Sleep+. No significant difference in sex prevalence (Males: 23.8% MS-Sleep-, 39.1% MS-Sleep+), mean age (MS-Sleep-: 34.7±8.9 vs MS-Sleep+: 38.5±13.5 years old) and disability at diagnosis (EDSS MS-Sleep-: 1.6±0.8; MS-Sleep+: 2.0±0.5) was detected. MS-Sleep+ subjects had higher scores on anxious-depressive symptoms (BDI: 15.5±10.6 vs 8.8±9.37; STAY: 59.0±10.7 vs 51.7±10.8, p=0.05), accentuated fatigue (FSS: 4.2±1.5 vs 2.9±1.4, p<0.005), reduced quality of life (MSQOL-54physical: 56.3±18.2 vs 73.6±13.6, MSQOL-54mental: 56.6±22.5 vs 72.4±17.3, p< 0.005) and motor skills (9-HPTdx: 20.6±4.1 vs 18.5±2.6, p< 0.05) than MS-Sleep- subjects (**Table 1**). The cognitive scores were all supra-threshold and comparable, except for Tower of London (mean score: 28.7±4.6 in MS-Sleep+ vs 30.6±2.7 in MS-Sleep-, p<0.05) (**Table 2**). No differences were detected on daytime sleepiness.

Discussion and conclusions: in line with others studies, our investigation confirms a relationship between sleep complains, emotional status, fatigue and quality of life. Poor sleep does not influence overall cognitive functioning, though slightly affecting only the executive domains, at least in earlier stages of MS. In contrast with current literature, we did not find any contribution of daytime sleepiness to sleep disorders and fatigue. Further longitudinal observations and a larger sample are needed to validate these findings.

References:

C. Veauthier, G. Gaede et al. Poor sleep in multiple sclerosis correlates with Beck Depression Inventory values, but not with polysomnographic data. Sleep disorders, Epub 2016 Jan 18
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Table 1. Demographic, clinical and psychobehavioural characteristics

	MS-SLEEP- (N=42)			MS-SLEEP+ (N=23)			p value
	%	mean	sd	%	mean	sd	
Gender (Male)	23.8			39.1			
Age (years)		34.7	8.9		38.5	13.5	0.175
EDSS		1.6	0.8		2.0	0.5	0.060
TWT T0		10.0	1.6		10.5	1.7	0.236
9HPT right		18.5	2.6		20.6	4.1	0.016
9HPT left		20.1	3.6		22.7	7.2	0.061
PSQI		3.0	1.3		9.3	3.3	0.000
BDI		8.8	9.7		15.5	10.6	0.013
STAI-y Trait		49.5	11.2		56.9	11.5	0.014
STAI-y State		51.7	10.8		59.0	10.7	0.011
ESS		6.0	3.4		6.2	4.5	0.786
MSQOL-54p		73.6	13.6		56.3	18.2	0.000
MSQOL-54m		72.4	17.3		56.6	22.5	0.002
FSS		2.9	1.4		4.2	1.5	0.001

Table 2. Neuropsychological profile

	MS-SLEEP- (N=42)		MS-SLEEP+ (N=23)		p value
	mean	sd	mean	Sd	
MMSE	29.7	1.0	29.2	1.6	0.256
BRB					
SRT-LTS	46.5	12.2	46.6	12.2	0.974
SRT-CLTR	33.0	16.2	34.5	15.5	0.730
SPART	18.4	5.5	20.2	5.9	2.210
SDMT	52.2	10.5	52.2	14.4	0.977
PASAT 3	38.5	13.9	41.2	13.7	0.539
PASAT 2	28.8	11.2	33.1	13.4	0.267
SRT-D	8.5	2.4	8.5	2.2	0.983
SPART-D	6.7	2.3	7.4	2.4	0.205
WLG	23.7	6.7	23.9	4.5	0.921
WCST	57.2	34.9	59.2	32.1	0.831
Digit Span forward	5.3	1.0	5.6	1.0	0.323
Digit Span backward	4.7	1.2	4.7	1.6	1.000
Corsi	5.2	1.1	4.8	0.9	0.139
Rivermead1	10.9	2.6	10.3	1.9	0.302
Rivermead2	20.9	2.3	21.2	2.7	0.608
Tower of London	30.6	2.7	28.7	4.6	0.047
Phonemic Fluency	35.9	11.8	36.3	9.6	0.883
Rey Figure copy	30.9	2.4	30.6	2.7	0.644
Rey Figure recall	14.4	6.3	15.4	6.4	0.578
Raven's Matrices	29.8	3.9	30.6	3.4	0.395
TMTA	37.6	12.5	36.3	13.6	0.697
TMTB	106.6	73.5	85.3	40.0	0.222
Attentive Matrices 1	9.7	0.6	9.7	0.5	0.749
Attentive Matrices 2	37.8	3.8	37.6	5.2	0.830