# New Trends in MS Rehabilitation

## P1018

### RELATIONSHIP BETWEEN COGNITIVE PERFORMANCES AND FATIGUE PERCEPTION IN MULTIPLE SCLEROSIS.

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Background: Cognitive impairment in Multiple Sclerosis (MS) occurs in 40-65% of patients, independent of motor deficits and demographic data[1]. Fatigue occurs in 80% of MS patients and in 40% may reduce motor abilities before the occurrence of severe neurological deficits[2]. Both cognitive performances and fatigue influence occupational and social handicap. This study is aimed to verify how far cognitive performances are related to other variables.
Methods: We assessed 64 MS patients (M/F: 23/41; age 40.3 ± 10.1 years, range 21-65, disease duration 7.1 ± 4.6 years, range 1-25) with EDSS score ≤6.0. Cognitive performances were tested using Digit-Symbol (DS), Buschke-Fuld test (BF), Word Fluency (WF), Wisconsin Card Sorting Test (WCST) and Kohs' Block test (KB). As factors able to influence cognition were considered age, disease duration, EDSS, depression (Beck score) and fatigue perception (MS Specific Fatigue Scale, MSSFS). Multiple Regression Analysis was applied to identify the role of each variable on cognition.
Results: Fatigue is related to verbal learning (BF) (p=0.0012) and executive abilities (KB) (p=0.0078),while attention (DS) is influenced by age (p=0.0008). Word Fluency (WF) and WCST seem to vary independent of all the examined variables.
Conclusions: The results support the hypothesis that cognitive performances are influenced by fatigue, as measured by MSSFS, in the early stages of the disease[3]. The relationship between fatigue perception and cognitive performances is focused on certain abilities, often involving frontal lobe functions. These results are in agreement with recent opinions regarding a central mechanism of fatigue[4].
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1. Rao SM et al. Neurology 1991; 41: 685. 2. Krupp LB et al. Arch Neurol 1988; 45: 435. 3. Kujala P et al. J Neurol, Neurosurg & Psych 1995; 59: 77. 4. Kersten P et al. Clin Rehab 1996; 10: 233

## P1019

### DIFFERENT CLINICAL CORRELATES OF FATIGUE IN RELAPSING REMITTING AND PROGRESSIVE MULTIPLE SCLEROSIS

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Background: Fatigue is a common and disabling symptom in MS. This study investigates the clinical correlates of fatigue in a cohort of 166 clinically definite MS patients.
Materials and methods: We studied 38 relapsing-remitting (RR), 34 primary-progressive (PP) and 94 secondary-progressive (SP) patients. They were evaluated by means of EDSS with functional systems (FS), Ambulation index (AI), Fatigue severity scale (FSS), Mini mental state (MMSE), anxiety (STAI), depression (CDQ) and quality of life assessment (SF-36).
Results: The mean (±SD) FSS scores were respectively 39.8±15 in RRMS, 44.2±10 in SPMS, 51±7 in PPMS (p= 0,0002 by Anova). Fatigue worsening was significantly related to age, disease duration, EDSS, AI, depression, anxiety and decreased quality of life in RR disease but not in SP or in PP MS.
Conclusion: This study documents that fatigue severity changes according to different clinical subtype of MS, being greater in primary and secondary progressive compared to relapsing remitting MS patients.The significant association between fatigue and both physical and psycological factors limited to RR patients suggests the occurence of distinct mechanisms underlying the development of fatigue in MS.

## P1020

### INVALID USE OF THE BECK DEPRESSION INVENTORY TO IDENTIFY DEPRESSION IN MS

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**Background:** According to previous studies, MS patients have an significantly more major depressive episodes than other patients with chronic disease. We do not have specific instruments to assesment depression in these patients. Moreover, some of the symptoms of MS may also constitute symptoms of depression and overlaping them. Our study will measure the clinical value of BDI, fast, easy and the most widely used test for measuring depression, by the expanding the initial inventory instructions, in order to increase its utility towards the MS depression ratio
**Materials and Methods:** 10 patients suffering from clinically defined remitting-relapsing MS ( 6 women and 4 men), vulnerable to depression, complete the BDI twice. During the second test, in the previous information given to patients, we help them to clearly separate the symptoms of depression from those of MS.
**Results:** Sixty percent of the patients modified items in the second test, improving the measure of depressed mood.
**Conclusions:** The BDI is inadequate for measuring depression in MS patients. Detailing the information about the depressed symptoms can be useful in this group of patients to improve the information about their mood.

## P1021

### Sleep related breathing disorders do not explain daytime fatigue in multiple sclerosis.

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Aim: MS plaques, particularly below the tentorium have been proposed to cause sleep related breathing disorders. Sleep apnea often presents as fatigue or excessive sleepiness. We aimed to study the incidence and pattern of sleep related breathing disorders in MS and their correlation to parameters of daytime fatigue. Patients and Methods: We examined 28 patients (14 f /14 m; mean age 41 y) with clinically verified MS, definite disability (EDSS 1-7.5), no immunomodulatory nor CNS-specific therapy. For the groups further referred to as "moderate" (n=11) and "severe" (n=10) presence of infratentorial lesions on cranial MRI were mandatory for inclusion into the study. A third group (n=7) with predominantly spinal involvement will be referred to as "spastics". Standard somnopolygraphy (after adaptation night), multiple sleep latency tests after the second somnopolygraphy and a daytime EEG were performed in each individual. On the first morning a validated fatigue severity scale (Krupp), a visual analogue scale of tiredness and the HAMD were applied. Results: In all patients mixed or obstructive apnea index was lower than that of central apneas, the latter preferrably occuring in REM sleep. In the whole group the mean respiratory distress index (RDI) was 6.4 +/- 6.1 without a significant difference between the groups "severe" or "spastic". RDI above 10/h was found in 7 out of 28 (25%). Despite a low RDI, there was a high degree of fatigue. In contrast, high RDI was not associated with higher fatigue or shorter sleep latencies on MSLT. Not EDSS, nor increased body mass index nor age were positive predictors for sleep related breathing disorders As shown previously (Bohr 1997), fatigue in MS is not explained by the amount or type of sleep fragmentation, nor could this recent results support the hypothesis that fatigue in MS is correlated with nocturnal hypoxia or breathing associated sleep fragmentation.

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Hamilton M.A.: A psychiatric rating scale for depression. J Neurol Neurosurg Psychiat 1960; 23:56-62
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P1030

## The validity of clinical scales used in multiple sclerosis

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*Objective*: To assess the construct validity of the four most widely used scales in multiple sclerosis research: the Expanded Disability Status Scale (EDSS), the Scripps Neurological Rating Scale (SNRS), the Ambulation Index (AI), and the Functional Independence Measure (FIM).
*Material and methods*: Fifty patients with clinically or laboratory definite multiple sclerosis patients (EDSS 0 to 7.5, median 4.5) were assessed with the EDSS, SNRS, AI, FIM, Barthel Index, the London Handicap scale and the Short Form 36 Health Survey Questionnaire. All the patients were ranked by two raters according to their perceived degree of disability, their ability work, do their housework, and look after themselves. The patients also underwent high resolution *T1*- and *T2*-weighted MRI lesion load assessment as a measure of pathology.
*Results*: The SNRS, but not the other scales, correlated weakly with *T1*- and *T2*-weighted MRI lesion load (r = 0.38, 0.30 respectively). The EDSS correlated strongly with the SNRS (r=0.92), the FIM (r=-087), and the AI (r= 0.68). The Barthel Index correlated strongly with the FIM (r=0.88) but not the other scales. All scales correlated strongly with the disability ranks (r=-0.83 to 0.92) and the physical functioning domain of the SF-36 (0.82 to 0.87), but moderately with the patients' ability to work (r=0.59 to 0.69), do their house work (r=0.55 to –0.64), and with other handicap and quality of life measures.
*Conclusions*: This study confirmed the validity of existing clinical rating scales used in multiple sclerosis as measures of impairment (SNRS, EDSS), and disability (EDSS, FIM and AI).

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## NEUROPSYCHOLOGICAL CORRELATES OF MULTIPLE SCLEROSIS

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BACKGROUND AND OBJECTIVE: Multiple Sclerosis (MS) is the most common neurologic disorder causing disability in young adults. Neurocognitive dysfunction, which is a considerable cause of disability and that may occur in the absence of positive clinical symptoms in MS, was studied in a sample of our MS population.
MATERIALS AND METHODS: The study was conducted on 37 definite MS cases (Poser's Criteria) to examine the degree and nature of cognitive impairment in MS. A comprehensive neuropsychological battery (NPb) was administered to 17 relapsing remitting (RR), 13 secondary progressive (SP) and 7 primary progressive-(PP) patients with a mean age of 34.3 ± 8.0 and disease duration of 13.82 ± 21.2 years. The mean expanded disability status scale (EDSS) score was 3.82 ± 2.38 at examination. The (NPb) included tests of intellectual ability, verbal learning and memory, attention and concentration, conceptual reasoning, information processing, visual perception, verbal fluency and interhemispheric transfer of information. Measures of depression and anxiety were also obtained. ANOVA and Regression analysis were applied.
RESULTS: Based on the entire MS sample, reduced speed of information processing (76%), memory impairment (76%) and poor conceptual reasoning (73%) were the most common neurocognitive deficits and didn't differ for each MS subgroup. Language functions were preserved best (76 %). With regard to emotional status, PP patients were more anxious and depressed than SP and RR. Disease duration was associated with memory impairment ($p<0.05$). Reduced speed of information processing was found to be related to the first symptom at the initial stage of the disease ($p<0.05$), and the number of first year attacks was associated with overall cognitive impairment ($p<0.05$).
CONCLUSIONS: MS was found to have a negative impact upon neurocognitive functions in our sample regardless of the disease course with the exception of first year attack rate.

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## EVENT-RELATED POTENTIALS (P300) IN THE ASSESSMENT OF COGNITIVE DECLINE IN MULTIPLE SCLEROSIS PATIENTS

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The aim of the study was an attempt to assess cognitive decline in multiple sclerosis (MS) patients using event-related potentials (ERP).

13 patients (9 female, 4 male), aged 35-58 years, with clinically definite, relapsing-remitting MS (duration of the disease 2-28 years, mean 10 years) and 10 healthy, age-matched controls (2 female, 8 male) were included in the study. Auditory and visual ERP were recorded in all the subjects in a standard „oddball paradigm" , latency and amplitude of P300 component was analysed. A battery of psychometric tests was performed in all the patients and their results were referred to ERP. Total load of demyelinative lesions in MRI was also considered.

Mean latency of visual P300 was significantly longer in MS patients in comparison with the controls (404,2 ms and 376,0 ms, respectively; $p<0,05$), there was no such difference as for auditory P300. Amplitude of visual and auditory P300 were lower in MS patients, but without statistical significance. Inverse correlation was found between amplitude of auditory P300 and the result of psychometric test Digit Span ($r=-0,67$, $p<0,05$).

Changes of P300 parameters are useful element in the assessment of cognitive decline in MS patients.

P1033

## Cognitive dysfunction and Alexithymia in Multiple Sclerosis.

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*Background*: Cognitive dysfunction occurs in 50 to 65% of patients with MS. Alexithymia is characterized by an inability to find words to describe feelings or emotion. A high incidence of alexithymia was previously reported in MS patients when using Toronto Alexithymia Scale (TAS) and Parallel Visual Information Processing Test (PVIPT). We have recently suggest that alexithymia was related to callosal disconnection. The aim of this study was to evaluate the potential relationship between degree of cognitive impairment and alexithymia in MS patients.

*Materials and methods*: The patients group consisted of 21 patients satisfying criteria for definite relapsing-remitting MS in clinical remission at time of evaluation ((13 females and 8 males; mean age 36 yrs; mean duration of MS:6yrs; mean EDSS:3.5). Patients were submitted to an extensive neuropsychological battery, including evaluation of memory, attention, language and visuospatial skills. Degree of alexithymia was evaluated with TAS and PVIPT while anxiety and depression were also estimated with Covi and Hamilton scales.

*Results*: On a neuropsychological point of vue, MS patients performances were significantly lower than controls concerning memory (immediate and delayed recall of figure and short story, learning of a list of words with delayed recall and recognition of designs) and attention (Stroop test). On the other part, 60% of MS patients were alexithymic on TAS and PVIPT. However, no significant correlation was found between degree of alexithymia, cognitive impairment, depression and anxiety ($r<.38$,$p>.05$).

*Conclusion*: These findings suggest that alexithymia is not related to cognitive dysfunction in MS and more argue the hypothesis that alexithymia would be subtended by interhemispheric disconnection mechanisms.