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MS & Demyelinating Diseases
Spatial attention in multiple sclerosis

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Background: Cognitive impairment is recognized as a core feature of multiple sclerosis (MS). Mostly memory, attention, information processing speed and executive functions are affected.
Objective: To evaluate whether spatial distribution of attention differs between MS patients and controls in an institutional review board approved study.
Patients and methods: A case-control study was conducted in 30 MS (with EDSS lower than 3) patients, and age- gender- and education-matched 30 healthy individuals. Working memory, attention and executive functions were evaluated with PASAT and Trail Making Test part-A/B. Judgment of Line Orientation Test and Target Cancellation task were used to evaluate visual spatial perception and spatial distribution of attention, respectively. All subjects were also administered Beck Depression Inventory and Mini-Mental State Examination.
Results: Patient and control groups did not differ in means of gender, age and education. BDI scores were similar in both groups and general cognitive functioning of patients were much the same. MS subjects performed more poorly on the TMT part A/B and PASAT tests than the control group. Although MS patients' performance on visual spatial perception were much the same as control group (MS:22.6 $\pm$ 4.2, control:22.0 $\pm$ 3.9,$p = 0.612$), they performed poor on cancellation task (MS:122.2 $\pm$ 52.9 sec, control:92.7 $\pm$ 34.5 sec, $p = 0.014$). However, omission and commission errors were much the same. In MS group, cancellation time showed positive correlation with TMT-A (r:0.720,$p = 0.000$) and TMT-B (r:0.415, $p = 0.023$), and a negative correlation with PASAT scores (r:0.588,$p = 0.001$). As the disease duration and EDSS score increased cancellation task performance slowed down (r:0.440,$p = 0.015$; r:0.629,$p = 0.000$, respectively).
Conclusion: Our results suggest that visual spatial attention of MS patients is compromised.

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Interferon-beta 1A and disability progression in relapsing-remitting multiple sclerosis: 9-year follow-up study

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Background: Well-designed observational studies are currently recognized as a design which could provide significant information on the long-term impact of therapy.
Objective: To assess the impact of interferon (IFN)-beta treatment on the progression of unremitting disability in IFN-beta treated and untreated relapsing-remitting (RR) patients with multiple sclerosis (MS) using prospective cohort study.
Patients and methods: A cohort of 264 RRMS (133 IFN-beta-1a sc-treated and 131 untreated) patients was followed for up to 9 years. Cox proportional hazards regression models adjusted for the number of relapses in the last year before first visit was used to assess the differences between the two groups for the three end points: secondary progression (SP), and sustained Expanded Disability Status Scale (EDSS) score 4 and 6. Time from disease onset was used as survival time variable.
Results: There were no significant differences between the IFN-beta-treated and untreated MS patients for all baseline clinical variables except for number of relapses in the last year before the visit. The IFN-beta-treated group showed a highly significant reduction (hazard ratio [HR], 0.21, 95% confidence interval [CI] 0.11-0.40, $p < 0.001$) in the risk of SP when compared with untreated patients. There were significant differences in favor of the IFN-beta-treated group for the end point EDSS score of 4 (HR = 0.40, 95%CI 0.23-0.65, $p < 0.001$) and EDSS score of 6 (HR = 0.20, 95%CI 0.09-0.45, $p < 0.001$).
Conclusion: This observational study further supports the notion that IFN-beta could have potential beneficial effect on disease progression in RRMS.

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Gray matter involvement in multiple sclerosis; correlation of clinical and cognitive diasability with DTI magnetic resonance imaging findings

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Introduction: The relevance of grey matter (GM) pathology in MS relate better to cognitive and clinical disability than white matter (WM) lesions. Neocortex is typically affected but gray matter demyelination may also be found in non-cortical areas such as the hippocampus, thalamus, basal ganglia, cerebellar cortex and the spinal cord gray matter.
Objectives: Our aim was to investigate whether a particular pattern of cortcal and deep GM atrophy is associated with cognitive impairment in patients RRMS.
Methods: Expanded Disability Status Scale (EDSS), MS functional composite (MSFC) scores and MRI data from 40 people with RRMS and 20 d healthy controls were included in this study. Neuropsychological testing contributed measures of using the PASAT, SDMT and verbal fluency test (VFT) respectively.3 T-DTI and tractography were performed.
Results: In DTI-FT measurements, FA values of cortical GM areas were lower in all MS patients and MD values of GM areas were higher in MS patients ($p = 0{,}0001$). GM volume values were lower in MS ($p = 0{,}0001$). MD was significantly decreased in the right/left thalamus of patients with MS compared with controls ($p = 0.0001$), There was significant differences of caudate nucleus FAand MD patients with MS compared controls ($p = 0{,}005$, $p = 0{,}001$). A negative correlation between GM volume values of patients group and VFT was determined ($r = -0{,}340$ There was significant correlation of PASAT scores and left thalamus and caudate nucleus FA and MD in MS patient compared to controls.
Conclusions: Our study confirms that focal grey matter pathology contributes to physical disability and cognitive deficits in MS patients. Our results suggest that significant role of thalamus and caudate nucleus involvement in MS-associated cognitive deficits.

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