PRESERVATION OF BRAIN ADAPTIVE PROPERTIES CONTRIBUTES TO THE CLINICAL PICTURE OF BENIGN MULTIPLE SCLEROSIS

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Introduction

The exhaustion of the brain adaptive properties over time has been postulated to be one of the mechanisms responsible for the accumulation of irreversible disability in patients with the progressive phenotypes of multiple sclerosis (MS) (1-4). It is tempting to speculate that the long-term preservation of these properties might contribute to explain the more favorable clinical evolution of benign (B) MS. In this study, we investigated changes of activation of the motor network in patients with benign (B) multiple sclerosis (MS) in comparison with those with secondary progressive (SP) MS and healthy controls.

Methods

Using a 3T scanner, functional magnetic resonance imaging (fMRI) during the performance of a simple motor task was acquired from 17 BMS, 15 SPMS and 10 healthy volunteers (HV). BMS and SPMS patients were matched for age, sex, and disease duration. Analysis of activations was performed using SPM2 software. An Ancova model was used ($p< 0.05$, corrected for multiple comparison).

Results

Compared to HV, BMS patients had more significant activations of the left primary sensorimotor cortex (SMC), while SPMS patients had more significant activations of the left primary SMC, the left secondary sensorimotor cortex, the left infraparietal sulcus and the left inferior frontal gyrus (IFG), and several visual areas. Compared to HV and to BMS patients, SPMS patients had reduced activations of the left supplementary motor area and basal ganglia, and the right cerebellum. Finally, compared to BMS, SPMS patients had more significant activations of several areas in the frontal lobes, bilaterally and several visual areas.

Conclusions

The preservation of the mechanisms responsible for the overactivation of a given network might have a central role to explain the favorable clinical course of BMS.

References

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