



## DAREMUS

Dansk Selskab for Forskning i Multipel Sklerose

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**Abstract form:** Max 350 ord (punkt 3 – 6) på max én A4 side

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Følgende struktur bedes fulgt:

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- 2) Forfattere
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- 4) Metoder
- 5) Resultater
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# Is there a regional structural correlate of motor fatigue in multiple sclerosis? - a Magnetic Resonance Imaging study

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## Hypothesis

The role of Multiple Sclerosis (MS) related brain alterations in the pathophysiology of fatigue remains unknown hence the objective of this study was to address this question. Based on former studies (Gobbi 2014, Morgante 2010), we expect that the degree of fatigue experienced by the patients will be related to micro- and macro-structural WM alterations at specific brain regions, and not with global brain alterations like, e.g., global lesion load.

## Methods

We included 50 mildly disabled MS patients with relapsing remitting MS from the Danish Multiple Sclerosis Centre, Rigshospitalet. A group of 25 age- and sex-matched individuals were enrolled as controls. Fatigue was evaluated with the Fatigue Scale for Motor and Cognitive functions (FSMC). Additionally, all participants underwent a MS standard battery of tests, questionnaires and a Magnetic Resonance Imaging (MRI) examination. The MRI session included conventional structural scans and Diffusion Weighted Imaging (DWI). DWI data were analysed using anatomical connectivity mapping (ACM) and fractional anisotropy (FA) to extract detailed information about the structural connectivity between specific areas in the brain and regional voxel-wise microstructural tissue characteristics in WM.

We assessed the correlation between fatigue scores and MS related brain pathology at different anatomical levels:

- i) The macro-anatomical brain pathology measured by WM lesion load were assessed on conventional MRI scans.
- ii) The local microstructural brain structures were assessed by FA for detecting indices of abnormalities in WM.
- iii) The disruption of neural fibres connecting specific brain areas was assessed with ACM which reflects the strength of connectedness of each WM voxel (Lyksborg et al 2014).

## Results

MS patients had lower FA and ACM values in the motor region of corpus callosum compared to HC. Neither lesion load nor FA or ACM correlated significantly with the FSMC motor score in MS.

## Discussion

We found no association between fatigue experienced by the MS patients and regional structural brain pathology. The lack of association could be explained by variability of the locations of MS pathologies in the brain. These preliminary results still need further validation.