

## MULTIPLE SCLEROSIS

**Spinal cord grey matter loss correlates with disability in MS**

Improved imaging methods have provided new *in vivo* evidence for the role of spinal cord grey matter atrophy in multiple sclerosis (MS): two recent studies suggest that loss of spinal cord grey matter is the main contributor to progressive disability.

“...grey matter atrophy was the strongest correlate of disability...”

Post-mortem studies have identified extensive abnormalities in spinal cord grey matter in patients with MS, however, movement artifacts and poor contrast between grey and white matter on conventional MR images have hampered *in vivo* assessment of the spinal cord.

“Recent advances in MR imaging enabled us to come up with a reliable segmentation method of the grey matter and white matter compartments in the spinal cord,” says Regina Schlaeger.

Schlaeger and colleagues used phase-sensitive inversion recovery MRI to study

spinal grey matter atrophy in patients with relapsing–remitting MS (RRMS), progressive MS (PMS), and healthy controls. Patients with RRMS showed loss of spinal cord grey, but not white, matter; in PMS, both grey and white matter were affected. White matter atrophy in the spine was associated with disability in patients with PMS, though grey matter atrophy was the strongest correlate of disability.

In another study, Hugh Kearney and co-workers compared spinal grey matter atrophy in patients with clinically isolated syndrome, RRMS, secondary PMS and healthy controls using diffusion tensor imaging. In line with the findings of Schlaeger *et al.*, Kearney and colleagues found that measures of spinal cord atrophy correlated with disability: spinal cord radial diffusivity alone explained 70% of variance in the disability score. “Spinal cord grey matter abnormalities were significantly greater in secondary PMS compared with RRMS or clinically isolated syndrome,” Kearney summarizes.

Both studies demonstrate that increases in grey matter loss are associated with disability progression, but the findings from these two cross-sectional studies cannot address how the imaging findings relate to the pathogenetic processes that underlie MS.

Kearney says that his group plans to study the pathological correlates of grey matter atrophy in an *ex vivo* study of spinal cords from patients with MS. Schlaeger and colleagues, on the other hand, would like to validate spinal cord grey matter assessment as a potential predictor of progression and disability in a longitudinal study.

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**Original articles** Schlaeger, R. *et al.* Spinal cord gray matter correlates with multiple sclerosis disability. *Ann. Neurol.* doi:10.1002/ana.24241 | Kearney, F. H. *et al.* Spinal cord grey matter abnormalities are associated with secondary progression and physical disability in multiple sclerosis. *J. Neurol. Neurosurg. Psychiatry* doi:10.1136/jnnp-2014-308241