

# Medical Update Memo

March 3, 2010

## MRI of the corpus callosum in multiple sclerosis: association with disability

### Summary

The corpus callosum is one of the most important white matter tracts in the brain and forms the major connection between the two cerebral hemispheres, being involved in the performance of complex tasks. The corpus callosum is one of the regions of the brain affected in MS, but its study by conventional MRI techniques has not been satisfactory. The authors found that abnormalities in the corpus callosum can be assessed with new quantitative MRI techniques and are associated with cognitive and complex upper-extremity dysfunction in MS. *Mult Scler.* 2010 Feb;16(2):166-77

### Details

Inflammatory demyelination and axon damage in the corpus callosum are prominent features of multiple sclerosis (MS) and may partially account for impaired performance on complex tasks. Researchers aim was to characterize quantitative callosal MRI abnormalities and their association with disability. In 69 participants with MS and 29 healthy volunteers, lesional and extralesional callosal MRI indices were estimated via diffusion tensor tractography. expanded disability status scale (EDSS) and MS functional composite (MSFC) scores were recorded in 53 of the participants with MS. All tested callosal MRI indices were diffusely abnormal in MS. EDSS score was correlated only with age ( $r = 0.51$ ). Scores on the overall MSFC and its paced serial auditory addition test (PASAT) and 9-hole peg test components were correlated with callosal fractional anisotropy ( $r = 0.27, 0.35, \text{ and } 0.31$ , respectively) and perpendicular diffusivity ( $r = -0.29, -0.30, \text{ and } -0.31$ ) but not with overall callosal volume or callosal lesion volume; the PASAT score was more weakly correlated with callosal magnetization-transfer ratio ( $r = 0.21$ ). Anterior callosal abnormalities were associated with impaired PASAT performance and posterior abnormalities with slow performance on the 9-hole peg test. In conclusion, abnormalities in the corpus callosum can be assessed with quantitative MRI and are associated with cognitive and complex upper-extremity dysfunction in MS.

National Research and Programs

Offert en français.

**Disclaimer**

The Multiple Sclerosis Society of Canada is an independent, voluntary health agency and does not approve, endorse or recommend any specific product or therapy, but provides information to assist individuals in making their own decisions.