

# Medical Update Memo

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## Relationship of cortical atrophy to fatigue in patients with multiple sclerosis

### Summary

Fatigue is a common and disabling symptom in MS, although the underlying mechanisms are not fully understood. The authors investigated the relationship between fatigue (measured by a specific neuropsychological test) and specific MRI parameters, in people with MS and in healthy volunteers. They found that in people with MS, the degree of fatigue was correlated with the damage in certain areas of the brain cortex which are known to be involved in motor planning and integration of information. **Neurol. 2010 Apr**

### Details

Fatigue is a common and disabling symptom of multiple sclerosis (MS). Previous studies reported that damage of the corticostriathalamocortical circuit plays an important role in MS fatigue. Using a case control study approach, NIH researchers sought to investigate the relationship between fatigue in MS and regional cortical and subcortical gray matter atrophy. Twenty-four patients with MS and 24 matched healthy volunteers underwent 3.0-T magnetic resonance imaging and evaluations of fatigue (Modified Fatigue Impact Scale) and depression (Center for Epidemiologic Studies Depression Scale). The relationship between thalamic and basal ganglia volume, cortical thickness of frontal and parietal lobes, and, in patients, T2 lesion volume and normal-appearing white matter volume and the extent of fatigue were evaluated.

Patients were more fatigued than healthy volunteers ( $P = .04$ ), while controlling for the effect of depression. Modified Fatigue Impact Scale score correlated with cortical thickness of the parietal lobe ( $r = -0.50$ ,  $P = .01$ ), explaining 25% of its variance. The posterior parietal cortex was the only parietal area significantly associated with the Modified Fatigue Impact Scale scores.

**CONCLUSIONS:** Cortical atrophy of the parietal lobe had the strongest relationship with fatigue. Given the implications of the posterior parietal cortex in motor planning and integration of information from different sources, the preliminary results suggest that dysfunctions in higher-order aspects of motor control may have a role in determining fatigue in MS.

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