

Mechanisms underlying fatigue: a voxel-based morphometric study of chronic fatigue syndrome.

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Authors: Okada T, Tanaka M, Kuratsune H, Watanabe Y, Sadato N.

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**BACKGROUND:** Fatigue is a crucial sensation that triggers rest, yet its underlying neuronal mechanisms remain unclear. Intense long-term fatigue is a symptom of chronic fatigue syndrome, which is used as a model to study the mechanisms underlying fatigue.

**METHODS:** Using magnetic resonance imaging, we conducted voxel-based morphometry of sixteen patients and 49 age-matched healthy control subjects.

**RESULTS:** We found that patients with chronic fatigue syndrome had reduced gray-matter volume in the bilateral prefrontal cortex. Within these areas, the volume reduction in the right prefrontal cortex paralleled the severity of the fatigue of the subjects.

**CONCLUSION:** These results are consistent with previous reports of an abnormal distribution of acetyl-L-carnitine, which is one of the biochemical markers of chronic fatigue syndrome, in the prefrontal cortex. Thus, the prefrontal cortex might be an important element of the neural system that regulates sensations of fatigue.

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