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### **Gray matter volume reduction in the chronic fatigue syndrome.**

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The chronic fatigue syndrome (CFS) is a disabling disorder of unknown etiology. The symptomatology of CFS (central fatigue, impaired concentration, attention and memory) suggests that this disorder could be related to alterations at the level of the central nervous system. In this study, we have used an automated and unbiased morphometric technique to test whether CFS patients display structural cerebral abnormalities. We mapped structural cerebral morphology and volume in two cohorts of CFS patients (in total 28 patients) and healthy controls (in total 28 controls) from high-resolution structural magnetic resonance images, using voxel-based morphometry. Additionally, we recorded physical activity levels to explore the relation between severity of CFS symptoms and cerebral abnormalities. We observed significant reductions in global gray matter volume in both cohorts of CFS patients, as compared to matched control participants. Moreover, the decline in gray matter volume was linked to the reduction in physical activity, a core aspect of CFS. These findings suggest that the central nervous system plays a key role in the pathophysiology of CFS and point to a new objective and quantitative tool for clinical diagnosis of this disabling disorder.

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