Effect of immunomodulatory medication on regional gray matter loss in relapsing-remitting multiple sclerosis : a longitudinal MRI study

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Prevention of global gray matter (GM) volume changes in multiple sclerosis (MS) are an objective in clinical trials, but the effect of immunomodulatory medication on regional GM atrophy progression is unclear. MRIs from 86 patients with relapsing-remitting MS (RRMS) followed up for 24 months were analyzed using voxel-based morphometry. An analysis of covariance model (cluster threshold, corrected $p<0.05$) was used to compare GM volumes between baseline and follow-up while stratified by immunomodulatory medication (IM): Interferone INF-beta-1a (n=34), INF-beta-1b (n=16), glatiramer acetate (GA) (n=15), and no-immunomodulatory treatment (n=21). In the INF-beta-1a/1b group (n=50), significant GM volume reductions were observed during follow-up in fronto-temporal, cingulate and cerebellar cortical brain regions, without significant differences between the INF-beta-1a and INF-beta-1b patients. In the GA group and in unmedicated patients, no significant regional GM volume reductions were observed. In contrast to GA, INF-beta-1a/1b treatment was associated with GM volume reductions in hippocampal/parahippocampal and anterior cingulate cortex. This is the first longitudinal study investigating the effects of IMs on GM in RRMS. Results suggest differences in the dynamics of regional GM volume atrophy in differentially treated or untreated RRMS patients.
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