Rate of brain atrophy in relapsing MS decreases during treatment with IFN-beta-1a.

OBJECTIVE: To determine the time course of brain atrophy during treatment with once-weekly IM interferon beta-1a (IFN-beta-1a).

METHODS: The MRI cohort (n = 386) of the European IFN-beta-1a dose comparison study in relapsing multiple sclerosis (MS) was analyzed. In addition to baseline and three annual scans, a frequent subgroup (n = 138) had two scans before treatment initiation and scans at months 4, 5, 6, 10, and 11. Brain parenchymal fraction (BPF), a normalized measure of whole-brain atrophy, and volume of Gd-enhancing lesions (T1Gd) and T2 hyperintense lesions (T2LL) were evaluated. RESULTS: BPF decrease was -0.686% (first year), -0.377% (second year), and -0.378% (third year). Analysis of the frequent subgroup showed that 68% of the first-year BPF decrease occurred during the first 4 months of treatment. This change was paralleled by a drop in T1Gd and T2LL. In the frequent subgroup, an annualized atrophy rate was determined by a regression slope for the pretreatment period and from month 4 of treatment onward. Annualized pretreatment rate (-1.06%) was significantly higher than the under-treatment rate (-0.33%).

CONCLUSIONS: In the first year of treatment with anti-inflammatory agents, atrophy measurements are possibly confounded by resolution of inflammatory edema or more remote
effects of previous damage to the CNS. The atrophy rate reduction observed after treatment month 4 may reflect a beneficial but partial effect of interferon beta-1a and was sustained over the 3-year study period.