

# Effect of ofatumumab on brain atrophy and its association with clinical outcomes in relapsing-remitting multiple sclerosis

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## BACKGROUND

Brain atrophy is a marker of neurodegeneration in multiple sclerosis (MS) and is associated with disability progression. Although disease-modifying therapies reduce atrophy and clinical progression, its effect on brain atrophy remains insufficiently explored. This study evaluated the impact of OFA on brain atrophy.

## METHODS

Patients with relapsing-remitting MS (RRMS) treated with OFA between 2021. Clinical measures included Expanded Disability Status Scale (EDSS) score, annualized relapse rate (ARR), and magnetic resonance imaging (MRI) activity (T2-weighted and gadolinium-enhancing lesions). MRI scans were analyzed using FreeSurfer.

## RESULTS

89 patients were included. Over two years OFA reduced annualized relapse rate (0.50 vs 0.06) and T2 lesions (1.40 vs 0.08), with stable normalized lesion size (ZIN). No significant atrophy was observed ( $p > 0.05$  for all patient-years), though %WM-hypo accumulation in Patients correlated (0.53 vs -0.47). Subcortical GM (0 vs -0.56), and total gray matter volume (-0.13 vs -3.77) worsened ( $p < 0.01$ ), whereas predictors of disability progression achieved inverse relationships (positive estimates for baseline EDSS, %WM-hypo accumulation (0.51 in -0.004) (Figure 3). For progression with regression independent of relapse and magnetic resonance imaging activity %WM-hypo showed no significant atrophy but preserved WRU (Table 1). %WM and %WM-hypo increased (2.27% vs 1.86%). Patients treated at low or high disease activity had lower GM atrophy (0.04 vs -4.99), both change 1.24 vs -0.72) and subcortical GM (1.34 vs -0.24).

## CONCLUSION

OFA limited brain atrophy over two years, with the most favourable outcomes observed in clinically stable and de novo treated patients.

Figure 1. Volumetric changes over a two-year follow-up

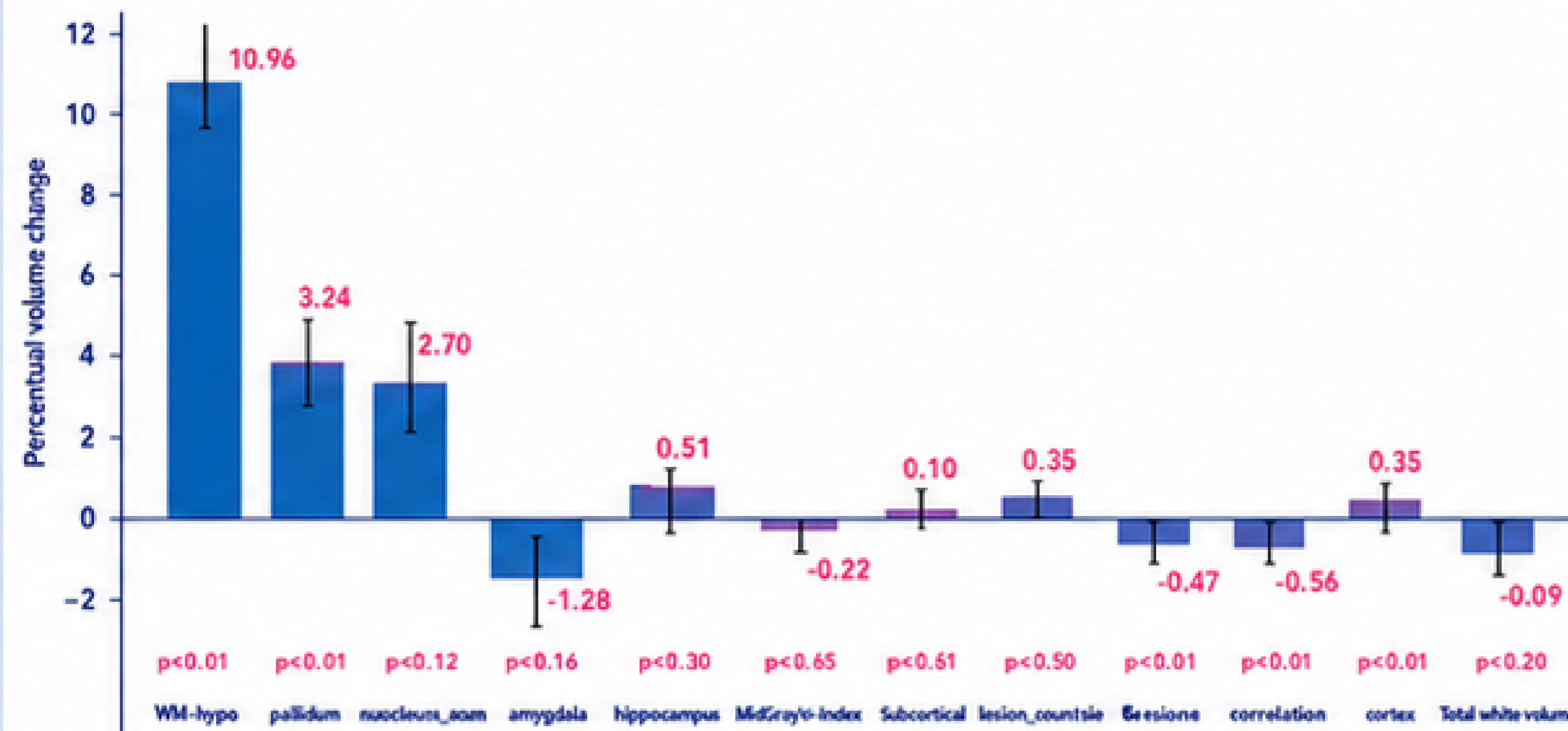


Figure 2. Two-year volumetric changes in patient-years with EDSS progression versus stable EDSS

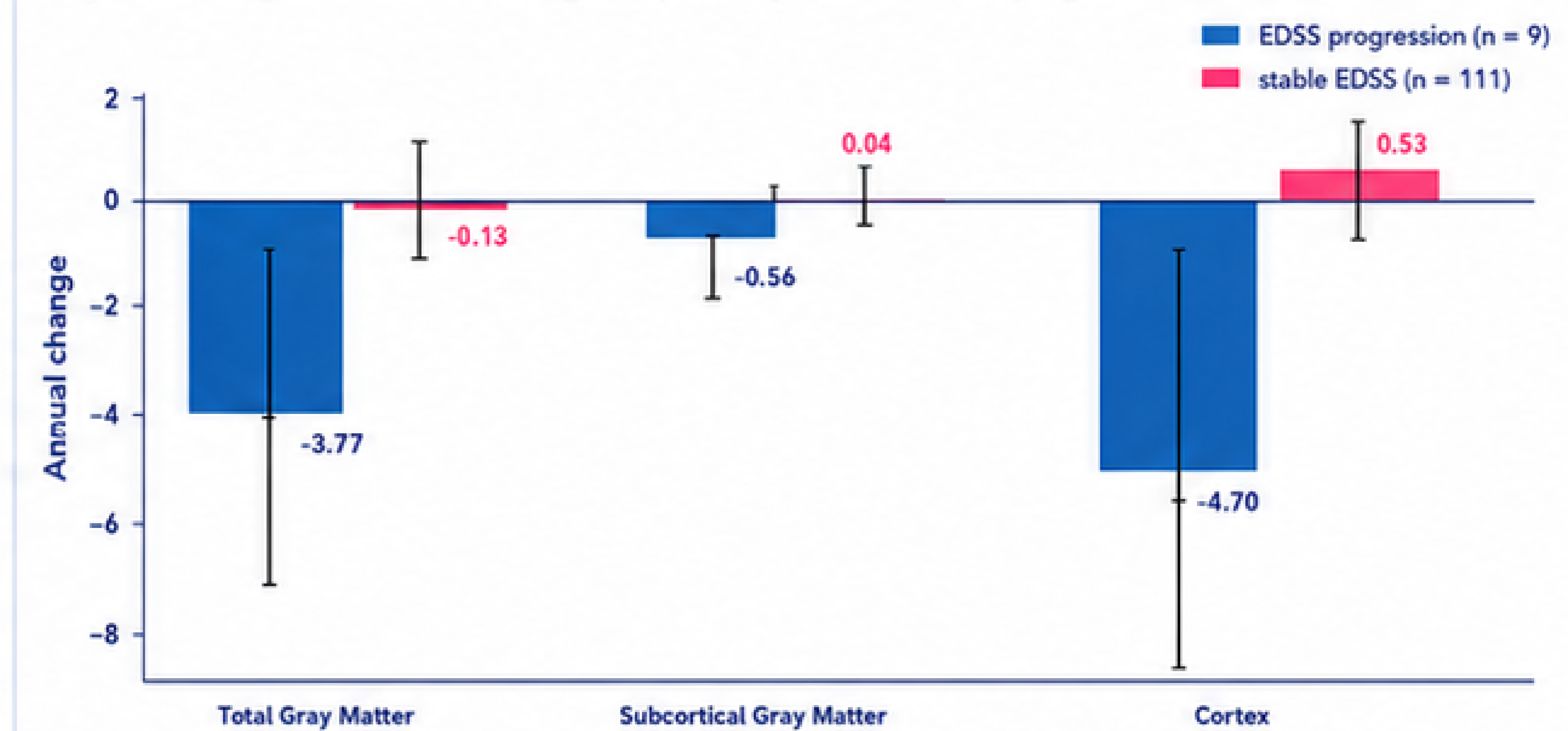


Figure 3. Comparison of patient-years with EDSS progression and stable EDSS

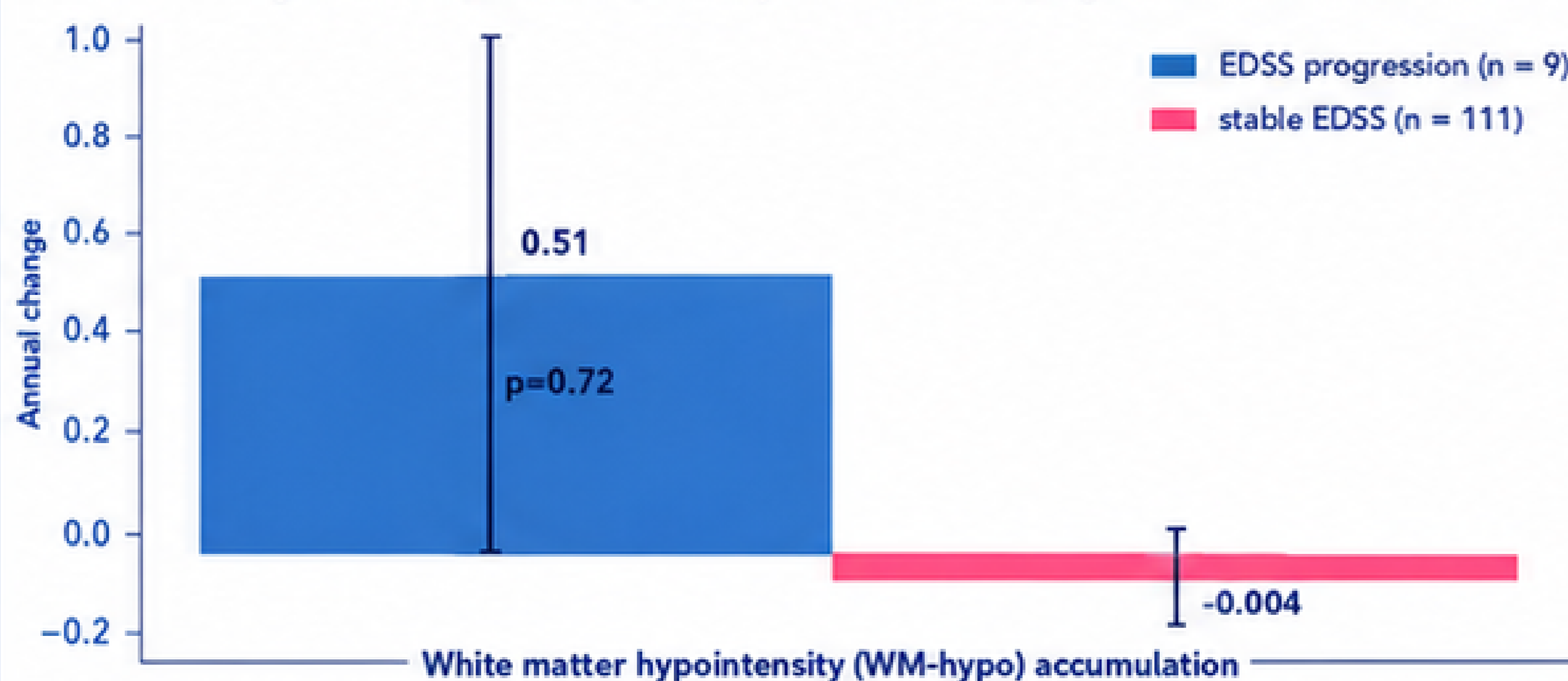


Table 1. Clinical and radiological outcomes before and during ofatumumab treatment

Parameter	Before OFA treatment	After 1 year	After 2 years
ARR	0.500	0.091	0.065
Mean T2 lesions number	1.401	0.091	0.078
Mean Gd+ lesions number	0.477	0.011	0.000
Mean EDSS score	1.926	2.051	2.084

**Legend:** ARR - annualized relapse rate; T2 - T2-weighted; Gd+ - gadolinium-enhancing; EDSS - Expanded Disability Status Scale.