The effect of Fingolimod on grey matter damage, focal and diffuse, in RRMS patients.

Albulena Bajrami (main author), Marco Pitteri, Stefano Ziccardi, Damiano Marastoni, Francesco Crescenzo, Marco Castellaro, Stefania Rossi, Roberta Magliozzi and Massimiliano Calabrese

Disclosures: Massimiliano Calabrese received honoraria for reasearch or speaking from Sanofi-Genzyme, Merck-Serono, Biogen Idec, Bayer, Novartis Pharma and funds for travel from Sanofi-Genzyme, Merck-Serono, Biogen Idec, Teva, Novartis Pharma, Roche and Bayer.
All the other authors have nothing to disclose.

ABSTRACT

Introduction: The effect of Fingolimod (FTY720) on GM pathology in MS is still controversial. Our aim is to evaluate the efficacy of FTY720 in reducing/preventing both focal and diffuse damage of GM in active MS.
Methods: In this 2-year prospective, phase IV, single-blind study, we enrolled 37 patients treated with FTY and 40 patients treatment-free. Each patient underwent a neurological examination every 6 months and a 3T MRI at baseline (T0), after 12 (T12) and 24 months (T24). The images were processed by MIPAV to detect the cortical lesion (CLs) and by FreeSurfer to establish regional volumes and cortical thickness. The Neuropsychological Tests has been performed in 16 patients, at T0 and at the end of the study. The accumulation of new CLs, the progression of regional atrophy and related cognitive dysfunctions were compared between the two groups.
Results: At T24, the percentage of patients with new CLs was lower in the treated compared to untreated patients (13.5% vs. 89.0%, $p<0.001$). The percentage of grey matter volume change (PGVC), was significantly lower in the treated compared to untreated group ($0.41 \pm 0.12\%$ vs. $0.56\% \pm 0.16\%$; $p<0.001$). Freesurfer analysis revealed that the treated group at T24 had less volume loss in thalamus, caudatus, globus pallidus, and in hippocampus ($p<0.001$), and also in cingulate cortex, cerebellum and insular-long gyrus ($p< 0.05$). The NEDA-3 ('no evidence of disease activity') patients were significantly more in the treated group (60.0%) than the untreated group (10.0%) ($p<0.001$). Three cognitive tests significantly differed between T0 and T1: SRT-D ($p < 0.007$), MFPT-CS ($p < 0.007$) and PASAT-3 ($p < 0.001$).
Conclusion: These results suggest a significant treatment effect of FTY720 on GM pathology. However, due to sample size and a short follow up, these findings require confirmation in future investigations based on a larger follow up.