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Test-retest reliability of spatial-temporal gait parameters (minute-by-minute) in people with multiple sclerosis during the 6MWT

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Introduction: People with multiple sclerosis (pwMS) often present walking fatigability (WF), frequently measured through the 6-minute walk test (6MWT) and defined as a 10% decrease in distance walked from the sixth to the first minute (calculated using the distance walk index (DWI)).
Objective: Previous studies investigated reliability of spatial-temporal gait parameters in pwMS mostly during short walking but few during prolonged walking (6MWT), in pwMS with WF.
Aim: To evaluate the test-retest reliability of spatial-temporal gait parameters minute-by-minute in absolute values in pwMS with and without WF and healthy controls (HC) during the 6MWT.
Methods: Thirty-four pwMS (20 with WF, EDSS 4.8±1.2 and 14 without WF, EDSS 5.2±1.2) and 19 HC (30-75 years) were included in the study. The 6MWT was performed two times in two different sessions (5-7 days apart). Spatial-temporal gait parameters (cadence, gait speed, double support, step duration, and stride length) were obtained from APDM (OPAL, USA) sensors. Intraclass correlation coefficients (ICCs) were calculated to assess the reliability of these gait parameters in the three subgroups (with and without WF, and HC).
Results: Test-retest reliability for the subgroup with WF was moderate-to-excellent (0.51-0.99) for each minute of the 6MWT, and poor-to-excellent for the subgroups without WF (0.39-0.99) and HC (0.32-0.98), with lowest values at minute 6.
Conclusion: Spatial-temporal gait parameters measured minute-by-minute during the 6MWT were reliable in pwMS with walking fatigability. Consistencies of the results were observed over the three groups.

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Ocrelizumab reduces focal lesions and global/regional volume changes if compared to other second-line treatment

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Introduction: Randomized controlled trials have shown significant benefits of ocrelizumab (OCR) use in terms of clinical and MRI outcomes in relapsing-remitting (RR) and primary-progressive (PP) MS.
Aims: To assess the effect of OCR on clinical and MRI outcomes compared to another second-line treatment, fingolimod (FTY).
Methods: 94 MS patients (56 RR-OCR, 13 PP-OCR and 39 RR-FTY) underwent 24 months of clinical and 3T MRI follow-up. The number of white matter (WM) and cortical lesions (CLs) were detected on FLAIR and DIR sequences. The global and regional volumes/thickness changes of 37 regions were calculated with freesurfer. The variables obtained were compared between RR-OCR vs RR-FTY and RR-OCR vs PP-OCR using Mann-Whitney or t-test.
Results: RR-OCR and RR-FTY did not differ in age, sex, disease duration and WM lesions volume at T0. At T24, RR-OCR patients experienced less relapses ($p<0.001$) and new WM lesions ($p=0.03$), whereas the EDSS change, and the new CLs did not differ with RR-FTY. The RR-OCR showed less deep grey matter volume loss (-0.33% ± 0.82% vs -0.57% ± 0.89%; $p=0.03$), less mean cortical thickness change (-0.44% ± 0.62% vs -0.66% ± 0.71%; $p=0.04$) and less volume loss in the following regions: superior parietal ($p<0.001$;D=0.78),cerebellar cortex/white-matter ($p=0.01$; D=0.6 / $p=0.005$; D=0.5), anterior cingulate ($p=0.002$; D=0.6), middle frontal ($p=0.008$; D=0.6), superior frontal ($p=0.002$; D=0.5), hippocampus ($p=0.03$; D=0.5), caudate ($p=0.02$; D=0.5), putamen ($p=0.04$; D=0.4).
Compared to RR-OCR at T24, PP-OCR did not show significant differences in EDSS change nor in new WM lesions/CLs, however, they showed higher volume loss in the mean deep grey matter ($p=0.002$; D=0.9), hippocampus ($p<0.001$; D=1.0), cerebellar cortex/white matter ($p<0.001$; D=1.0 / $p=0.001$; D=0.9), and lateral occipital gyrus ($p=0.02$; D=0.6).
Conclusions: Compared to FTY, OCR showed higher suppression of focal MRI lesions and a significant effect on global and regional brain volume loss, a marker of both inflammatory and neurodegenerative phenomena. This role might be fundamental in PP patients who showed higher volume loss rates in key brain regions, suggestive of a "silent" disability progression not seen clinically.

Disclosure
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