

The Effect of High-Volume Walking with Visual Cues on Gait in Parkinson's Patients. A Randomized Controlled Trial.

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Introduction: Parkinson's patients tend to walk with decreased step length and gait velocity and increased stride time variability which is worsened by dual tasking. Step length and, particularly, stride time variability have been related to postural instability and increased fall risk. Walking with visual cues has been shown to be a powerful tool in normalizing step length in PD during single session studies, but limited evidence provides support for the automaticity of such effects in gait, especially in the long term.

Purpose: The purpose was to find out if (1) high-volume walking with visual cues would provide long-term increases in step length and velocity and a decrease in stride time variability compared with walking without cues and (2) if increased step length would be maintained during dual task testing.

Methods: Participants were 26 PD patients (mean HY 2.12 ± 0.33). They were randomly assigned into an intervention group (IG) or a control group (CG). Both groups underwent a 4 weeks walking programme, 30 mins 4x/week, where only the intervention group received visual cues during walking. Step length was measured at self-selected and fast speeds by means of an electronic walkway system (GAITRite). Measurements were performed with or without a dual task (DT). Participants also performed the Timed Up & Go test (TUG) and filled out the Parkinson's Disease Questionnaire-39 (PDQ-39). Post-training and 3 months follow-up measurements were conducted by an independent rater.

Results: The participants as a whole demonstrated increased step length and velocity on average at the end of training ($p < 0.001$) at both speeds and both with and without DT, while stride time variability remained unchanged. These results were maintained at follow-up. There was, however, no significant difference in the change between the two groups over time. Similarly, TUG showed a general improvement ($p < 0.05$) but no difference between groups. PDQ-39 did not change significantly after training, but there was an interaction effect ($p < 0.05$).

Conclusions: This study showed that a high-volume walking programme improves step-length, velocity and TUG performance, but not stride time variability, in PD patients, and that the results are maintained 3 months later. Those improvements are, most likely, the result of improved automaticity of walking. The results, however, do not support a specific benefit of visual cues during training. The improvements in gait and TUG performance did not seem to transfer unto quality of life for this particular group of patients as reflected by the PDQ-39 scores.