

OP-41: Effects of dance on gait and dual-task gait in Parkinson's disease assessed using Vicon 3D-motion capture

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Introduction: Gait impairments are well-known in people with Parkinson's disease (PD). While dance-based interventions could improve gait, further studies are needed to determine if the benefits generalise to different terrains and when dual-tasking. A feasibility study was performed to assess the effects of Dance for PD® (DfPD®)-program on gait under different dual-tasks (verbal fluency, serial subtraction) and surfaces (even, uneven), and to determine if a larger-scale randomised clinical trial (RCT) is warranted.

Methods: A dance group (DG; n=17; age=65.8 ± 11.7 years) and a control group (CG; n=16; age=67.0 ± 7.7 years) comprising non-cognitively impaired (Addenbrooke's score: DG=93.2 ± 3.6, CG=92.6 ± 4.3) independently locomoting people with PD (Hoehn & Yahr I-III) participated in the study. The DG undertook a one-hour DfPD®-based class, twice weekly for 12 weeks. The CG had treatment as usual. Gait analysis was performed at baseline and post-intervention while walking on two surfaces (even, uneven) under three conditions (regular walking; dual-task: verbal-fluency- DT_{VERB}, serial-subtraction- DT_{SUBT}).

Results: The spatio-temporal variables of gait for regular walking and dual-tasking did not differ significantly at baseline. Based on pre-post change scores, the DG improved significantly compared to the CG in gait velocity (p=0.017), cadence (p=0.039), step length (p=0.040) and stride length (p=0.041) during regular walking on even surface. During DT_{VERB}, significant improvements were noted in gait velocity (p=0.035), cadence (p=0.034) and step length (p=0.039). The DG also exhibited significant improvement compared to the CG during DT_{SUBT} in the measures of gait velocity (p=0.012), cadence (p=0.021), step length (p=0.018) and stride length (p=0.151). On the uneven surface, the DG walked more cautiously during regular walking but had improved gait velocity (p=0.048), cadence (p=0.026) and step length (p=0.051) when performing serial-subtractions.

Conclusions: DfPD®-based classes produced clinically significant improvement on spatiotemporal even surface gait parameters with and without a dual-task and uneven surface walking with a serial subtraction task. This could arise from improved movement confidence and coordination; emotional expression; cognitive skills (planning, multitasking), and utilisation of external movement cues. A large-scale RCT of this program is warranted.

Keywords: Parkinson's disease, gait, dance