



RehabMove 2018: THE EFFECTIVENESS OF VIDEO GAME-BASED BALANCE TRAINING IN CHILDREN WITH CEREBRAL PALSY

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PURPOSE: To determine whether 6 weeks home-based video game-based balance training (VGBT) is effective to improve gait stability and standing balance in children with cerebral palsy (CP).

METHODS: Preliminary data of our registered trial (NTR6034) is presented. Eight children with CP (8-16 years old) were included if they had: bilateral spastic CP, GMFCS level II, no surgery <12 months, and no Botulinum-Toxin A injections <6 months. VGBT comprised 6 weeks home-based X-box One Kinect (Microsoft) training. Kinect sports games (tennis, football, bowling) were used 5x/week, 30min/session. Time played was monitored. Pre and post VGBT, participants performed unperturbed treadmill walking trials at self-selected speed. Total body (Plug-In-Gait) kinematics were collected via a 10-camera Vicon system at 120Hz. For gait stability, medio-lateral Margins of Stability (MoS) was calculated as the position of the extrapolated center of mass (XCoM) relative to the lateral malleolus of the leading foot. High MoS indicates more stable gait. Variability of MoS (sdMoS) was determined (high variability indicates less stable gait). Standing balance was assessed with Pediatric Balance Scale (PBS); a 14-item measure concerning everyday tasks (on 56 points; high PBS indicates good balance).

RESULTS: Only sdMoS improved significantly post VGBT ([Mean±SD] pre sdMoS 2.6±1.2cm versus post sdMoS 2.0±0.7, $p=0.030$). MoS and PBS did not change significantly post VGBT (pre MoS 17.8±2.8cm versus post MoS 18.5±4.3, $p=0.401$; pre PBS 49.1±5.4 points versus post PBS 50.6±3.5, $p=0.673$).

CONCLUSION: Preliminary results indicate that VGBT did not induce improvements on PBS in children with CP. On the other hand, sdMoS did improve significantly after VGBT in the current population. These findings may indicate that PBS is less sensitive to training-induced changes or that training-induced sdMoS improvements are not clinically relevant.