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Abstracts will be considered for both poster and platform presentations

Movement disorders

Body weight supported treadmill training (BWST) has been widely implemented in the clinical setting and proves effective to enhance walking performance in the populations with either neurological or orthopedic conditions. However, it has limitations such as potential influence on gait kinematics and muscle firing pattern. Recently, a more advanced anti-gravity treadmill rehabilitation means using lower body positive pressure (LBPP) has been developed and shows positive effects on walking performance in population with movement disorders including stroke and cerebral palsy. However, there lacks study on its effects in the population with multiple sclerosis (MS). The objective of this case series study is hence to investigate the effectiveness of anti-gravity treadmill gait training on neuromuscular function, dynamic balance and gait in the population with MS. Three female participants (mean(std), age: 39.7(13.8) yrs; body weight: 133.3(22.5) lbs; body height: 63(1.7)in; duration:5(3) yrs) with MS received 8 sessions (two times per week) of 30-min anti-gravity treadmill gait training. We evaluated dynamic balance/mobility using a 3D accelerometer when participants were walking on the treadmill at self-selected speed. Clinical instruments including Berg balance test (BBT, a 14 item clinical scale) and 2-minute walking test (2MWT) were also conducted. In addition, neuromuscular function of lower-extremity muscles were assessed using surface EMGs in eight groups of muscles on each side while participants were walking on the treadmill and over ground. Post four-week treadmill gait training, 2MWT is improved from 520(69.3) ft to 573(71.3) ft and BBT is improved from 54.5(0.7) to 56(0). Data on gait, dynamic balance and/or neuromuscular function are being processed and results will be available shortly. The proposed anti-gravity treadmill gait training, once proved effective, will likely lead to future large scale clinical trial and have impact on clinical practice of gait training.