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Combined Effect of Gender Differences and Fatiguing Task on Unipedal Postural Balance and Functional Mobility in Adults with Multiple Sclerosis

Authors : Sonda Jallouli, Omar Hammouda, Imen Ben Dhia, Salma Sakka, Chokri Mhiri, Mohamed Habib Elleuch, Abedlmoneem Yahia, Sameh Ghroubi

Abstract : Multiple sclerosis (MS) is characterized by gender differences with affecting women two to four times more than men, but the disease progression is faster and more severe in men. Fatigue represents one of the most frequent and disabling symptoms related to MS. Results of previous studies regarding gender differences in fatigue perception in MS persons are contradictory. Besides, fatigue has been shown to affect negatively postural balance and functional mobility in MS persons. However, no study has taken into account gender differences in the response of these physical parameters to a fatiguing protocol in MS persons. Given the reduction of autonomy due to the alteration of these parameters induced by fatigue and the importance of gender differences in postural balance training programs in fatigued men and women with MS, the aim of this study was to investigate the effect of gender difference on unipedal postural balance and functional mobility after performing a fatiguing task in MS adults. Methods: Eleven women (30.29 ± 7.99 years) and seven men (30.91 ± 8.19 years) with relapsing-remitting MS performed a fatiguing protocol: three sets of the 5×sit to stand test (5-STST), six-minute walk test (6MWT) followed by three sets of the 5-STST. Unipedal balance, functional mobility, and fatigue perception were measured prefatigue (T0) and post fatigue (T3) using a clinical unipedal balance test, timed up and go test (TUGT), and analogic visual scale of fatigue (VASF), respectively. Heart rate (HR) and rate of perceived exertion (RPE) were recorded before, during and after the fatiguing task. Results: Compared to women, men showed an impairment of unipedal balance on the dominant leg ($p<0.001$, $d=0.52$) and mobility ($p<0.001$, $d=3$) via reducing unipedal stance time and increasing duration of TUGT execution, respectively. No gender differences were observed in 6MWT, 5-STST, HR, RPE and VASF scores. Conclusion: Fatiguing protocol negatively affected unipedal postural balance and mobility only in men. These gender differences were inconclusive but can be taken into account in postural balance rehabilitation programs for persons with MS.

Keywords : functional mobility, fatiguing exercises, multiple sclerosis, sex differences, unipedal balance
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