Cognitive Dual Tasking Impacts Lower Limbs Inter-Segmental Coordination During Walking in Patients with Multiple Sclerosis

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6. Special thanks to Ahvaz Rehabilitation and NeuroEngineering Research Center, under the supervision of Dr. Mofatehr.

INTRODUCTION
Gait disturbance is one of the most common and disabling signs in patients with multiple sclerosis (MS). Coordination ability between segments of lower extremities, as a higher order property of the human movement system, is affected by MS disease.

AIM
Some inter-segmental coordination could be affected by cognitive loading, this study was aimed to investigate the interaction between cognition and lower extremities inter-segmental coordination during walking in patients with MS.

METHODS
This investigation included 17 patients with MS and 21 matched healthy controls (Table 1). Participants walked at their preferred speed on a motorized treadmill under two walking conditions in a random-order, walking only, walking while performing a concurrent cognitive task (counting backward aloud by 5). The mean double support phase (MDSP) and deviation phase (DP) were used to calculate the phase dynamic and variability of lower segmental coordination over the stance and swing phases of gait for each condition.

RESULTS
The statistical analysis showed that the interaction of task and group was only significant for MDSP: value of the double cell was not more than p (0.05). Group had a significant main effect in DP of double cell and foot-shank in stance and swing phases and MSHP of double cell in stance phase and foot-shank in stance and swing phases (p<0.05). In addition, the main effect of task was significant for MSHP and DP of double cell and foot-shank in stance and swing phases (p<0.01).

CONCLUSIONS
The results suggested that simultaneous-performance of cognitive task and walking could lead to higher changes in the inter-segmental coordination compared to single walking. Thus, hemiparesis exercise aimed at improving lower extremities inter-segmental coordination should be considered as the rehabilitative interventions of MS patients.

BIBLIOGRAPHY

ACKNOWLEDGEMENTS
Special thanks to Ahvaz Jundishapur University of Medical Sciences for the financial support.