

## Effects of Eccentric & Concentric Exercises on Postural Sway in Patients with Hemiparesis

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### Abstract:

**Background:** The third most common cause of death and the most common cause of disability among middle-aged individuals is stroke. Many stroke patients have a range of sensory and motor impairment, which cause postural control problems.

**Objective:** The objective of this study was to evaluate and compare the effects of eccentric exercise and concentric exercise on postural sway in hemiparetic patients.

**Materials and Methods:** This study was a randomized clinical trial which performed in the neuromuscular rehabilitation research center of Semnan University of Medical Sciences. Thirty six hemiparetic patients were randomly divided into two groups. One group performed eccentric exercise and the other concentric exercise using the treadmill. Displacement and velocity of displacement, before and after the intervention, in anteroposterior and mediolateral directions in both groups were measured and compared.

**Results:** Eccentric exercise compared to concentric exercise caused a significant decrease in the amount of displacement of center of pressure in the mediolateral ( $P=0.008$ ) and anteroposterior ( $P=0.020$ ) directions. The velocity of displacement of center of pressure was also lowered significantly by eccentric exercise in the mediolateral ( $P=0.005$ ) and anteroposterior ( $P=0.037$ ) directions compared to concentric exercise.

**Conclusion:** The findings of this research indicate that eccentric exercise causes improvements in displacement and velocity of displacement of center of pressure in postural sway of hemiparetic patients, more significantly compared with concentric exercise.

**Keywords:** Hemiparesis, stroke, postural sway