

Effect of Sustaining Paretic Lower Limb on an Unstable Surface to Provoke Muscle Contraction in Lower Extremity in Patients with Hemiplegia

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Abstract

Introduction: Activities with unstable surfaces provoke greater muscle contractions than stable ones. Unstable surfaces could provoke muscle contraction in the paretic side muscle in hemiplegia. The effect of sustaining the hemiparetic lower limb over an unstable surface on selected muscles of the lower extremity in patients in the acute phase of stroke has not been explored yet, and this was tested in this study.

Methods: First-time ischemic stroke patients who can follow the commands to perform the activities were included in the study and randomized into two groups.

Results: Overall, 28 patients (aged 65.53 ± 8.19 years) in the control group and 28 (aged 57.96 ± 10.89 years) in the experimental group completed the training. After ten training sessions, both groups showed increased activity in the quadriceps and hip abductors. Furthermore, the electromyographic activity in quadriceps and hip abductors was higher in the experimental group compared to the control group, and the difference was statistically significant ($p < 0.01$).

Conclusions: Training that involves efforts to sustain the paretic lower limb on an unstable surface can be used to provoke activity in selected muscles of the lower extremity. This concept can create a range of exercises that target various muscle groups and offer diverse training options. Including simple exercises with minimal equipment and manual assistance promotes self-exercise and will likely improve adherence to exercise intervention post-stroke.