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# Neuromuscular Control and Performance during Sudden Acceleration in Subjects with and without Unilateral Acute Ankle Sprains

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**Abstract :** Neuromuscular control of posture as understood through studies of responses to mechanical sudden acceleration automatically has been previously demonstrated in individuals with chronic ankle instability (CAI), but the presence of acute condition has not been previously explored specially in a sudden acceleration. The aim of this study was to determine neuromuscular control pattern in those with and without unilateral acute ankle sprains. Design: Case - control. Setting: University research laboratory. The sinker–card protocol with surface translation was be used as a sudden acceleration protocol with study of EMG upon 4 posture stabilizer muscles in two sides of the body in response to sudden acceleration in forward and backward directions. 20 young adult women in two groups (10 LAS; 23.9 ± 2.03 yrs and 10 normal; 26.4 ± 3.2 yrs). The data of EMG were assessed by using multivariate test and one-way repeated measures 2×2×4 ANOVA (P< 0.05). The results showed a significant muscle by direction interaction. Higher TA activity of left and right side in LAS group than normal group in forward direction significantly be showed. Higher MGR activity in normal group than LAS group in backward direction significantly showed. These findings suggest that compared two sides of the body in two directions for 4 muscles EMG activities between and within group for neuromuscular control of posture in avoiding fall. EMG activations of two sides of the body in lateral ankle sprain (LAS) patients were symmetric significantly. Acute ankle instability following once ankle sprains caused to coordinated temporal spatial patterns and strategy selection.

**Keywords :** neuromuscular response, sEMG, lateral ankle sprain, posture.
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