

COMPARISON OF ELECTROMYOGRAPHIC MUSCLE ACTIVITY OF HIP AND THIGH MUSCLES BETWEEN A STANDARD AND SUSPENDED LUNGE

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Background and Purpose: The lunge is a common exercise used to strengthen hip and thigh musculature. The effects of using suspension exercise equipment as a modification to a standard squat have not been investigated. The purpose of this study was to compare hip and thigh muscle recruitment during a standard lunge and a suspended lunge exercise. Number of

Subjects: Thirty healthy male and female subjects.

Methods and materials: EMG electrodes were placed on the adductors, rectus femoris, gluteus maximus, gluteus medius and hamstrings of the dominant leg. After a warm up, maximal voluntary isometric contractions (MVIC) were performed and EMG signals were recorded. Each subject then performed 3 repetitions of both the standard lunge and the suspended lunge exercise. EMG signals were captured from the forward (stance) leg and normalized to their respective MVIC's. Exercise order was randomized

Analysis: Descriptive statistics and paired t-tests were used to analyze differences in recruitment between exercise conditions.

Results: There was significantly greater muscle recruitment for the gluteus medius ($p < .001$), gluteus maximus ($p < .001$), hamstrings ($p = .002$), and adductors ($p < .001$) for the suspended lunge as compared to the standard lunge. No significant difference was found in EMG recruitment for the rectus femoris ($p = .06$) between the two lunge conditions.

Conclusion: The suspended lunge appears to be a more challenging exercise for hip muscles as compared to the standard lunge for healthy individuals. Suggestions for future work include investigating muscle recruitment patterns in individuals with lower extremity pathologies.

Implications: Clinicians can use this information in designing lower extremity strength and neuromuscular training programs.