

TESTING INFRASPINATUS AND DELTOID MUSCLES WITH NEW TECHNIQUE TO DECREASE DELTOID ACTIVITY DURING TESTING USING EMG ANALYSIS

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ABSTRACT

Background: Muscle strength testing of an injured infraspinatus muscle (IM) is confounded by actions of synergistic muscles such as the posterior deltoid (PD).

Hypothesis/Purpose: The purpose of this study was to describe a condition for testing of the IM that results in less EMG activity of the PD musculature. The researchers hypothesized that greater inhibition of the PD could be achieved through active adduction (AA), creating reciprocal inhibition of the PD.

Study Design: Prospective cohort descriptive study

Methods: Thirty-four (19 females and 15 males) right-handed subjects between the ages of 22- 31 (mean 24.2 years +/- 6.2) with no previous history of shoulder surgery or pathology participated. Surface electrodes were placed over the muscle bellies of the IM and PD of the right shoulder along with a ground electrode over the C7 spinous process. EMG activity was recorded during resisted external rotation in four different testing conditions (seated active and passive adduction, and side-lying active and passive adduction). The order of test positions was randomly assigned, and each subject completed all four positions with appropriate rest. During AA conditions, subjects were asked to adduct the humerus against a sphygmomanometer (using 80% maximum force output) while maximal effort external rotation was manually resisted.

Results: PD activity was significantly less during AA than with no AA ($p < 0.05$) in both test positions. No significant difference occurred between IM EMG activity in the various test conditions.

Conclusion: The results of this study suggest that clinicians can reduce activity of the PD without reducing activity of the IM by using AA of the humerus before applying manual resistance to test the IM during manual muscle testing.

Levels of Evidence: 1b.

Key Words: Electromyography, infraspinatus, infraspinatus test, posterior deltoid, manual muscle testing

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