Example abstract: Research-based category

An experimental pain model for sub-acromial shoulder pain: effects for strength, throwing accuracy, and electromyographic activity

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Introduction: Various impairments are associated with sub-acromial pain syndrome. However, it is uncertain whether these impairments are due to pain or structural damage, and whether they are contributors or consequences of injury. This study explored the effects of experimentally induced subacromial pain on shoulder impairments.

Methods: An experimental cross-over design was used with two conditions, without and with the induction of subacromial pain via hypertonic saline injection. 20 uninjured participants underwent assessments for isokinetic internal and external rotation strength, throwing accuracy, scapular upward rotation during abduction positions, and electromyographic (EMG) activity of shoulder muscles during elevation and descent.

Results: In the pain condition, peak torque decreased by 20% (P=0.001) and 17% (P=0.006) for internal and external rotation respectively, and throwing accuracy by 17% (P=0.001). Scapular upward rotation was increased during the pain condition at all angles of humeral elevation (P<0.001). Changes for EMG amplitudes activity of deltoid, rotator cuff and scapular-axial muscles during elevation were not significant.

Conclusion: Changes were noted with decreased functional performance (strength, throwing accuracy) and altered movement patterns (increased scapular upward rotation) but without consistent muscle activity changes. These findings suggest individual-specific responses to acute pain that are likely to have a protective effect.

Key practice points: Decreased muscle strength may not always indicate sub-acromial pathology or structural damage. Changes in EMG activity of shoulder muscles are highly variable despite consistent scapular rotation movement patterns in the presence of acute pain.

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