Effect of adduction during glenohumeral external rotation exercises in the scapulohumeral muscles

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Abstract

The effect of adduction during glenohumeral external rotation (ER) exercises on the scapulohumeral muscles is controversial. The aim of this study was to evaluate the effect of carrying out adduction during external rotation exercises in low and high shoulder positions on the electromyographic (EMG) activity of the infraspinatus (IS), middle deltoid (MD), and posterior deltoid (PD) muscles. EMG activity of the IS, MD, and PD muscles of 20 healthy participants was evaluated. Subjects performed 6 ER exercises that combined two factors: i) different adduction pressures according to biofeedback unit (0, 5 and 10 mmHg), and ii) low and high shoulder position. The pressure was controlled using a biofeedback unit. The low and high shoulder positions were 20° and 90° of abduction. In the low shoulder position, the activity of the IS muscle increased as the pressure on the biofeedback unit increased and the MD and PD muscles presented the highest activity at 10 mmHg. In the high shoulder position, the activity of the IS muscle was higher at 0 and 10 mmHg, the MD muscle presented higher activity at 5 mmHg, and PD muscle activity did not vary with the pressure. The addition of adduction at a pressure of 5 mmHg in the low shoulder position promotes is activity. Likewise, adduction at a pressure of 10 mmHg will promote activity of the IS, MD, and PD.

Author keywords

Electromyography; Exercises; External rotation; Physical therapy/rehabilitation; Rotator Cuff; Shoulder