Exercises Tailored to Meet the Needs of Submarine Pitchers

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OBJECTIVE

An article written by Trueldon, Sexton, and Pettit (2012) proposed that exercises should be tailored to meet the sport specific needs of submarine pitchers. To the knowledge of the researchers, this is the only published article that discusses this topic. It described two exercises commonly used for submarine pitchers. Based on the results, there were no significant differences present when comparing the exercises being tested, therefore; the researchers of this study deem that modifying the traditional exercise is unnecessary if the clinician is targeting the four muscles tested in this study. However, it may be beneficial to the submarine pitcher to perform the modified version of the exercise because it replicates the submarine throwing motion while still exercising the targeted muscles as efficiently and the traditional exercise.

A paired-samples t-test was calculated to compare the mean difference of the glenohumeral abduction angle of the peak muscle activity of the muscles being studied during each exercise. The angle of abduction was significantly less during the modified exercise for the posterior deltoid (13.17°, sd = 13.66°), middle trapezius (17.45°, sd = 24.04°), and lower trapezius (14.10°, sd = 18.01°).

A Pearson correlation coefficient was calculated for the relationship between participant’s for the maximum muscle activity achieved (normalized with % MVIC) for the posterior deltoid, infraspinatus, middle trapezius, and lower trapezius during the traditional and modified version of the cable retraction with ER exercise. The researchers found a strong positive correlation for peak muscle activation of the posterior deltoid (r(10) = .913, p < .001), infraspinatus (r(10) = .749, p < .001), middle trapezius (r(10) = .765, p < .001), and lower trapezius (r(10) = .850, p < .001) when comparing the two exercises.

A significant difference was found in the angle of abduction in which peak muscle activation occurred for the posterior deltoid [13°], the middle trapezius [17.45°], and lower trapezius [14.10°]. These three muscles achieved peak activation at a lower angle of abduction during the modified version of the exercises, than they did during the traditional version. This may warrant the utilization of this exercise because it allowed for peak muscle activation in a position that is less likely to cause subacromial impingement than the traditional exercise.

Future research needs to be performed to determine the biomechanics and muscle activation patterns of the submarine pitcher to develop a better understanding of the physiological demands of this activity. This knowledge will aid clinicians in developing appropriate exercise programs and techniques to train these athletes in a functional manner.