Effects of Personally Adaptive Joint Threshold Training on Glenohumeral Internal Rotation Deficits and Throwing Velocity in Collegiate Baseball Athletes
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**Context:** The effects of weighted ball training on glenohumeral internal rotation deficit (GIRD) and throwing velocity have been questioned. Identified as alterations within the throwing arm’s ranges of motion, GIRD has been previously linked to injuries such as internal impingement and type II SLAP tears. In an attempt to increase performance, through increased throwing velocity, coaches and athletes have successfully trained with differently weighted balls for a number of years. **Objective:** This study compared the effects of a 6-week weighted ball training program on glenohumeral internal rotation deficit and throwing velocity. **Design:** Randomized controlled trial. **Setting:** Two universities of equivalent skill and talent. **Participants:** Fifty collegiate baseball athletes, divided into a training group and a non-training control group. **Interventions:** The training group followed a modified version of the Personally Adaptive Joint Threshold Training (PAJTT) program. This program was modified to a 6-week period in the Fall that would fit more appropriately into a collegiate training period. The PAJTT program utilized balls of various weights, ranging from two ounces to two pounds, and was designed to increase throwing velocity and decrease GIRD. Athletes in the training group were asked to train 5 days a week, for 6 weeks. The control group did not participate in the training program, but was asked to continue training the way they normally would during the same six week time period. A 2x2 MANOVA was used to assess changes in glenohumeral ranges of motion in both throwing arm and non-throwing arm of the control and training groups. A 2x2 ANOVA was used to assess changes in throwing velocity from pre-intervention to post-intervention in both the control and training groups. **Main Outcome Measures:** Throwing velocity and passive internal rotation and external rotation measurements of the throwing and non-throwing arm were taken before and at the conclusion of the 6-week training program for all subjects. **Results:** The experimental group was found to have significant (p. 0.05) increases in glenohumeral internal and external rotation range of motion within the throwing and non-throwing arm. The throwing arm total arc of motion increased from 216.77±77 to 234.12±22.83, while the non-throwing arm increased from 202.18±16.15 to 220.77±16.37. The control group did not have significant (0.05) changes in glenohumeral ranges of motion. Changes in throwing velocity from pre-intervention to post-intervention measures were also not found to be significant (p. 0.05) in either group, with an average increase of 0.69±0.36 in the training group and 0.58±0.05 in the control group. **Conclusions:** These results demonstrate that the PAJTT program modified to fit into a 6-week period may not be an appropriate modification for collegiate baseball players. However, further research on the effectiveness of the PAJTT program in college baseball is necessary. **Word count:** 449