TACSM Abstract

Effect of four week medicine ball training on a peak ground reaction force & peak moments in collegiate lacrosse players.

DAKOTA B SKINNER, SCOTT MCLEAN, & JIMMY SMITH

Department of Kinesiology; Southwestern University; Georgetown, TX

Category: Undergraduate

Advisor / Mentor: McLean, Scott (mcleans@southwestern.edu)

ABSTRACT

Background: Medicine ball training has been shown to improve performance in baseball batting (Szymanski et al., 2007), and handball-throwing (Raeder, Fernandez, & Ferrauti, 2015). Given the similarity of the kinetic link dynamics of these activities with those of a lacrosse shot, a medicine ball training program may offer a similar performance benefit for a lacrosse shot. **Purpose:** The purpose of the present study was to investigate the effect of medicine ball training on peak ground reaction force (GRF) and peak GRF moments generated by collegiate level lacrosse players performing a overhand lacrosse shot. **Methods:** Sixteen collegiate lacrosse players volunteered to participate in this study. The control group (n = 8) and treatment group (n = 8) both participated in the same four-week lacrosse offseason program. This consisted of lacrosse practice 4 days a week as well as lifting 3 days a week. In addition, the treatment group participated in medicine ball training 3 days a week for 4 weeks. Medicine ball training consisted of 4-6 medicine ball exercises lasting 10-12minutes per session. Overhand lacrosse shot consisted of an approach such that their lead foot landed on a force plate. Force plate was sampled at 200 Hz, vertical GRF, and GRF moments about the X, Y, and Z axes were recorded at peak value for each kinetic measure. Medicine ball throw consisted of lead foot perpendicular to the length of the football field with trail foot shoulder width apart. Participants squatted with arms extended, and released the ball with maximal effort. Analyses of covariance were used to analyze peak GRF in the Z direction, peak moments in the X, Y, and Z directions, as well as distance achieved by a maximal effort medicine ball throw. **Results:** Average peak vertical GRF was similar before and after training for both the control group (1188 $\pm$ 173 N and 1172 $\pm$ 199 N, respectively) and treatment group (1206 $\pm$ 130 N and 1172 $\pm$ 199 N, respectively) (F_1= .043, p = .84). Average peak moment in the X direction was similar before and after training for both the control group (67 $\pm$ 57Nm and 92 $\pm$ 28Nm, respectively) and treatment group (75 $\pm$ 37Nm and 67 $\pm$ 25Nm, respectively) (F_1 = 3.07, p = .10). Average peak moment in the Y direction was similar before and after training for both the control group (63 $\pm$ 23Nm and 87 $\pm$ 39Nm, respectively) and treatment group (66 $\pm$ 37Nm and 76 $\pm$ 40Nm, respectively) (F_1 = .273, p = .61). Average peak moment in the Z direction was similar before and after training for both the control group (25 $\pm$ 10Nm and 30 $\pm$ 6Nm, respectively) and treatment group (24 $\pm$ 9Nm and 25 $\pm$ 12Nm) (F_1 = 1.41, p =.26). Average medicine ball throw distance was similar before and after training for the control group (12.75 $\pm$ 0.76m and 12.75 $\pm$ 0.76m, respectively) but the treatment increased their throw by nearly 1.0 m after training (12.96 $\pm$ 1.31m and 13.69 $\pm$ 1.22m, respectively) (F_1 = 4.392, p = .056, η^2 = .253). **Conclusion:** Despite a mild improvement in medicine ball throw, a four-week medicine ball training program had little effect on an overhand lacrosse shot.