

Effects of shoulder compensatory strength training program in rotator cuff strength of young swimmers

Batalha, N.¹ Raimundo, A.^{1,4} Tomás-Carús, P.^{1,4} Fernandes, O.¹ Sousa, J.P.¹ Costa, A.M.^{3,5} Silva, A.J.^{2,5}

¹ University of Évora, Portugal, ²University of Trás-os-Montes and Alto Douro, Portugal, ³University of Beira Interior, ⁴Health Science and Technology Research Centre ⁵Research Centre of Sports, Health and Human Development.

INTRODUCTION

The purpose of this study was to evaluate the effects of 16 week compensatory strength training program in shoulder strength and respective conventional ratios (concentric ER/IR).

METHODS

A total of 40 national level male swimmers were assessed and randomly divided in two groups – experimental group (N=20)-(age:14.65±0.67 years old, height:173.48±6.87 cm, body mass:63.15±5.68 kg) and control group (N=20)-(age:14.60±0.60 years old, height:170.79±6.48 cm, body mass:61.73±4.68 kg). Experimental subjects participated in a 16 week shoulder strength program with Thera-Band[®] elastic bands (3 times a week). The peak-torque of shoulder internal (IR) and external rotators (ER) was measured in both groups at baseline and after 16 weeks. Concentric action at 60°/s (3 rep) and 180°/s (20 rep) were measured, in a seated position, with the shoulder at 90° of abduction and the elbow flexed to 90°, using an isokinetic dynamometer (Biodex System 3 – Biodex Corp., Shirley, USA). Anova with repeated measures was used to determine significant main effects in shoulder rotators strength and unilateral ER/IR ratios. The level of significance was set at 0.05.

RESULTS

Significant differences were found in all variables that measure the ER shoulder strength at 60°/s in dominant (DT) (P=0.031) and non-dominant (NDT) shoulder (P=0.001). Meanwhile concentric action at 180°/s, only showed significant differences on DT shoulder (P=0.032). In respect of ER/IR ratio, a compensatory strength training programme induces significant differences in both shoulders at 60°/s (DT: P=0.001; NDT: P=0.001). At 180°/s we just found significant effects on the DT ER/IR ratio (P=0.002).

DISCUSSION

The results of this study support earlier research [1] that showed that the unilateral shoulder strength ratios increase substantially after a period of a strength training program. Since the ratios describe the quality of muscular balance/imbalance [1], we can conclude that a 16 week compensatory shoulder strength training program using Thera-Band[®] elastic bands, reduces muscular imbalances in rotator cuff of competitive young swimmers. These results highlight the usefulness of this kind of compensatory program to prevent shoulder injuries.

REFERENCES

1. Malliou, P.C. Giannakopoulos, K. Beneka, A.G. Gioftsidou, A. and Godolias, G. (2004). Effective ways of restoring muscular imbalances of the rotator cuff muscle group: a comparative study of various training methods. *Br. J. Sports Med.*;38:766-772.