

EFFECTS OF COMPENSATORY STRENGTH TRAINING PROGRAM ON SHOULDER ROTATOR CUFF BALANCE AND MUSCULAR FATIGUE IN YOUNG SWIMMERS

Batalha, N.,1 Raimundo, A.1,2, Tomas-Carus,P.1,2, Pereira, C.1 Silva, A.J.3,4

1:University of Évora, Portugal, 2:Health Science and Technology Research Centre, 3:University of Trás-os-Montes and Alto Douro, Portugal, 4:Research 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 rotators balance and muscular fatigue in young swimmers.

Methods

A total of 40 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 external rotator (ER)/internal rotators (IR) ratio and fatigue ratio were measured in both groups at baseline and after 16 weeks. Concentric action at 60°/s (3 reps) and 180°/s (20 reps) were measured, in a seated position, with the shoulder at 90° of abduction and elbow flexion, using an isokinetic dynamometer (Biodex System 3). The muscular fatigue protocol consisted in 20 maximal-effort repetitions of ER and IR at 180°/s.

Anova with repeated measures was used to determine significant main effects in unilateral ER/IR ratios and fatigue ratios. The level of significance was set at 0.05.

Results

Considering ER/IR ratio, a compensatory strength training programme induces significant differences in both shoulders at 60°/s (Dominant: P=0.001; Non dominant: P=0.001). At 180°/s we just found significant effects on the Dominant shoulder ER/IR ratio (P=0.002). With respect to fatigue ratios, we found no differences between groups from baseline and 16 weeks.

Discussion

Our results show that 16 weeks of compensatory strength training improve ER/IR ratio, nevertheless, were not enough to improve fatigue ratios, representing the rotators shoulder muscular resistance. This results support earlier research (Malliou et al., 2004) that showed that the unilateral shoulder strength ratios increases substantially after a period of a strength training program. Since the ratios describe the quality of muscular balance/imbalance (Ellenbecker & Davies, 2004), 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). Br. J. Sports Med. 38(6),766-772.
2. Ellenbecker, TS, and Davies, GJ. (2000). J Athl Train. 35(3), 338-350.

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