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

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

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

INTRODUCTION
The purpose of this study was to evaluate the effects of a 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 60º/s (3 rep) and 180º/s (20 rep) were measured, in a seated position, with the shoulder at 90º of abduction and the elbow flexed to 90º, 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 60º/s in dominant(DT) (P=0.031) and non-dominant(NDT) shoulder (P=0.001). Meanwhile concentric action at 180º/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 60º/s (DT: P=0.001; NDT: P=0.001). At 180º/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 increases 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 useful of this kind of compensatory program to prevent shoulder injuries.

REFERENCES