

## RESULTS

Cardiorespiratory performance was negatively associated with weight ( $r = -0.73$ ;  $p = 0.021$ ) and hip circumference ( $r = -0.60$ ;  $p = 0.067$ ) and was positively associated with waist-to-hip ratio ( $r = 0.65$ ;  $p = 0.042$ ) meaning that increased hip circumferences and body masses were predictors of reduced cardiorespiratory performance. The fact that no other no other body composition component showed relation with cardiorespiratory performance seem to indicate that the associations found may reflect more a mechanical influence, with metabolic consequences, rather than a metabolic effect of BC alone.

## DISCUSSION

Markers of body size and mass seem to explain better cardiorespiratory performance than other body composition markers more related with fat accumulation, in active non-athletes apparently healthy young adult male subjects. Future studies should confirm these results.

## REFERENCES

- American College of Sport Medicine. (2013). *ACSM's Guidelines for Exercise Testing and Prescription* (9<sup>th</sup> ed.). Baltimore: Lippincott Williams & Wilkins.
- Mooses, M., Jürimäe, J., Mäestu, J., Purge, P., Mooses, K., & Jürimäe, T. (2013). Anthropometric and physiological determinants of running performance in middle-and long-distance runners. *Kineziologija*, 45(2), 154–162.

## Is shoulder rotator strength and balance affected by a single swim practice?

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## INTRODUCTION

Dry-land training programs that focus on preventing shoulder rotators injuries are essential for swimmers. Normally, training routines comprise strength programs before (Batalha et al., 2015) or after (Ramsi et al, 2004) the swimming session. However, it is unclear if one swimming session will induce fatigue and impair muscle strength and balance. This study aimed to analyse the acute effects in shoulder rotators strength and balance after a standard swim practice.

## METHODS

Seventy-two male swimmers ( $16.28 \pm 1.55$  years;  $63.97 \pm 6.85$  Kg;  $174.1 \pm 7.89$  cm) performed strength tests targeting both shoulders before and after a standardized swim practice (with

4600m of total swimming volume in long course swimming pool: 900m of warm-up with low intensity tasks, 800m of technical training, 400m of velocity training, 1000m of aerobic training capacity, 600m of aerobic power training, and 900m of recovery tasks). A microFET2 hand-held dynamometer (Hoggan Scientific LLC, Utah) was positioned proximal to the ulnar styloid process on the posterior surface of the forearm to assess external (ER) and internal (IR) rotators strength. Maximal isometric strength and ER/IR ratios were assessed in prone position, as previously described (Ramsi et al. 2014). Prior to these tests a test-retest was performed in order to calculate the interclass correlation coefficients (ICC)

of the IR and ER evaluation. All ICC results were high (>0.90).

## RESULTS

Table 1

ER, IR and ER/IR ratios values before and after the swim practice.

Dominant shoulder				
	Pre-intervention (Mean $\pm$ SD)	Post-intervention (Mean $\pm$ SD)	Difference Mean (95% CI)	p
ER-PT (N)	151.15 $\pm$ 30,54	150.31 $\pm$ 32,99	- 0.84 (-5.47 to 7,16)	0.791
IR-PT (N)	196.30 $\pm$ 37.54	191.7 $\pm$ 40.61	- 4,60 (-2.06 to 11,27)	0.173
ER/IR ratio (%)	77.61 $\pm$ 11.73	79.51 $\pm$ 14.59	1.90 (-5.07 to 1.27)	0.236
Non-dominant shoulder				
	Pre-intervention (Mean $\pm$ SD)	Post-intervention (Mean $\pm$ SD)	Difference Mean (95% CI)	p
ER-PT (N)	137,73 $\pm$ 23,94	137,05 $\pm$ 24,63	- 0,68 (-3.67 to 5,04)	0.755
IR-PT (N)	200,83 $\pm$ 42,88	196,43 $\pm$ 45,19	- 4.40 (-2,41 to 11,21)	0.202
ER/IR ratio (%)	70.22 $\pm$ 12.80	71.62 $\pm$ 13.83	1.40 (-4,49 to 1,68)	0.369

p –paired sample T-test

No significant differences were found between strength values before and after the swim practice (table 1).

## CONCLUSION

The shoulder rotators strength and balance do not seem to be impaired after performing a standard swim session. Our results suggest that coaches can plan a shoulder rotators dry-land strength training program instantly after the swimming session.

## REFERENCES

Batalha, N., Raimundo, A., Tomas-Carus, P., Paulo, J., Simão, R., & Silva, A. J. (2015). Does a land-

based compensatory strength-training programme influences the rotator cuff balance of young competitive swimmers? *European Journal of Sport Science*, 15(8), 764–772. <https://doi.org/10.1080/17461391.2015.1051132>

Ramsi, M., Swanik, K. A., Swanik, C., Straub, S., & Mattacola, C. (2004). Shoulder-Rotator Strength of High School Swimmers Over the Course of a Competitive Season. *Journal of Sport Rehabilitation*, 13(1), 9–18. <https://doi.org/10.1123/jsr.13.1.9>

## Body Fat estimation among young football players: DXA versus Bioimpedance

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## INTRODUCTION

Accurate assessment of body composition is an important issue among sports athletes. Different methodologies used in the evaluation of body composition originate controversial results, leading to a deep uncertainty on individual exercise prescription. Thus, this study aims to identify the differences between a widely used method, such as bioelectrical impedance (BIA), and a clinical method,

highly accurate, Dual-energy X-ray absorptiometry (DXA), among elite young football players.

## METHODS

Observational study, recruited 38 male Football athletes with mean (sd) age of 16.7 (0.87) years, involved in the Portuguese national competition of U16 (n=13) and U19 (n=25). Study participants were invited to visit the *Escola Superior de Desporto e Lazer* to be