YOUNG SWIMMERS SHOULDER STRENGTH PROFILE: INTERNAL AND EXTERNAL ROTATION ISOKINETIC EVALUATION. A CONTRIBUTION TO NORMATIVE DATA.

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Introduction

The high incidence of overuse shoulder injuries in competitive swimmers is often attributed to both the high repetitive stresses inherent in the sport, as well as muscular imbalances in the humeral rotators (O'Donnell et al., 2005). The purpose of this study was to measure concentric glenohumeral joint internal and external rotation strength, to develop a bilateral descriptive profile in young competitive swimmers, contributing to the creation of normative data.

Methods

This was a cross-sectional study in which 60 male swimmers (age: 14.55 ± 0.5 years old; body mass: 61.16 ± 7.08 kg) were assessed. The peak torque of the external rotator (ER), internal rotators (IR) and the ER/IR ratio were evaluated with concentric actions. A seated position was used (90° abduction and elbow flexion) at $60^\circ.s^{-1}$ and $180^\circ.s^{-1}$ angular speeds using an isokinetic dynamometer (Biodex System 3). Both dominant (DS) and non-dominant shoulder (NDS) were assessed.
Descriptive statistics was performed for all variables using means and standard deviations. Calculations were performed using the SPSS software, version 19.0.

Results

The peak torque of IR ranged from 34.81 ± 9.33Nm to 31.15 ± 9.33Nm; the ER values were from 26.39 ± 5.66Nm to 22.07 ± 3.87Nm. Swimmers showed unilateral ratios of $77.89 \pm 15.23\%$ in the DS and $73.39 \pm 17,26\%$ in the NDS for assessments at $60^\circ.s^{-1}$. At $180^\circ.s^{-1}$, ratios were $74.77 \pm 13.99\%$ for DS and $70.11 \pm 14.57\%$ for NDS.

Discussion

Our results confirm that the IR ability to produce power is invariably superior to that of their antagonists. Regarding the shoulder rotators muscle balance, despite the fact that no normative data were available for young swimmers, some authors who evaluated older overhead athletes found values of ER/IR ratios between 66-75% (Ellenbecker & Roetert, 2003; Cingel et al., 2007). In our study, swimmers ER/IR ratios ranged from $70.11 \pm 14.57\%$ to $77.89 \pm 15.23\%$, values that are close to, but slightly higher, than the normative values previously described. Since the unilateral ratios distinguish the quality of muscle balance (Ellenbecker & Roetert, 2003), these data can serve as a normative reference to shoulder rotators balance in young swimmers.

References

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