RELATIONSHIP BETWEEN POWER DECREASE AND SWIMMING PERFORMANCE: A PILOT STUDY

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Introduction

Evaluation of athletes should be specific to nature of the sport. Apart from being used in dry-land, biokinetic swim bench tries to replicate the swimming arm movement. Indeed, Stager and Coyle (2005) stated that the decrease in power production may indicate sprint vs. distance profiles. Therefore, the aim of the present study was to analyse possible relationships between power production in swim bench and swimming performance.

Methods

Five male national level swimmers (age: 18.4 ± 2.3 years; body mass: 73.1 ± 7.7 kg, stature: 1.78 ± 8.3 m) volunteered to take part in the study. After a 600 m standard warm-up, each swimmer performed a 30 s maximum effort in a classic Vasa Swim Ergometer (Vasa, Essex Junction, USA). Individual power to time - P(t) - curves were assessed and registered to obtain the following parameters: maximum power (Pmax), average power (Pavg), average power in first 10 s (10Pavg), average power in last 5 s (5Pavg) and fatigue index (Findex). Additionally, fatigue slope (Fslope) was calculated as proposed by Morouço et al. (2012). One day after each subject executed one 50 m maximum crawl swim in a 25 meters swimming pool, being time registered (t50). After Shapiro-Wilk normality test, paired-samples t-Test to identify differences and Pearson's correlation coefficient (r) to establish relationships between variables were used. The level of statistical significance was set at $p < 0.05$.

Results

Swimmers took 3.4 ± 2.2 s to reach maximum power (204.2 ± 37.5 W). Average power in first 10 s was significantly higher than in last 5 s (181.4 ± 29.4 W; 127.7 ± 21.6 W, $p < 0.001$), with an associated Findex of 28.8 ± 5.7% and an Fslope of -2.63 ± 0.88. Swimming performance was 25.7 ± 0.75 s and it presented high correlations with time to reach Pmax ($p < 0.01$), Pmax, Pavg, 10Pavg, 5Pavg and Fslope ($p < 0.05$).

Discussion

Present data corroborate the studies suggesting that performance in short duration efforts is well related to the stroking power that a swimmer can generate (e.g., Costill et al., 1983). The assessment of this data may be an individual approach to performance in sprint distance races and, therefore, a helpful procedure to coaches. The presented parameter (Fslope) association with swimming performance induces the idea that short distance swimmers present higher decreases in P(t) curve, than long distance counterparts.

References

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Keywords:
Fatigue, Power , Sprint Profile

TOPIC: TRAINING AND TESTING
PRESENTATION FORM: POSTER
SESSION ART: POSTER