

ASSOCIATION BETWEEN THE FATIGUE INDEX IN TETHERED SWIMMING AND BREASTSTROKE PERFORMANCE

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Introduction: Fatigue index (FI) has been used as an important parameter in anaerobic capacity evaluation and, in swimming, it can be accessed through the tethered swimming test, by force-time characteristics analysis. **Objective:** Identify any possible relationship between FI obtained in tethered swimming test and performance in 50m breaststroke. **Methodology:** Sample was composed by 07 international level male breaststrokers (age: 26.0 ± 5.0 years, height: 1.88 ± 0.10 m, body mass: 81.95 ± 5.11 kg, % from World record in 50m breaststroke: $92.2 \pm 2.2\%$) from Brazil and Serbia. Swimmers accomplished a 30-s maximal breaststroke effort in tethered swimming. All cycles executed in intervals between 0-5s, 5-10s, 10-15s, 15-20s, 20-25, 25-30s were analyzed. In each interval, mean value of peak force (F_{peak}), average force (F_{avg}), rate of force development (RFD), impulse force (ImpF) and stroke duration (DUR) was retained for analysis. FI was calculated using the equation: [(highest value)-(lowest value)*100]/(highest value). Time in 50m breaststroke, obtained in competitive conditions, two weeks before or after the tethered test, was converted in International Point Score (IPS) (<http://www.swimnews.com/ipspoints>) to be used as performance variable. IPS system, recognized by the Fédération Internationale Natation Amateur, allows comparison among different strokes, distances and/or gender. 1100 points correspond to the mean of eight best times ever for that event. This procedure was adopted in order to minimize effects of pool size on results. Level of association between FI of each variable and IPS was obtained from Pearson linear correlation coefficient. Significance level was set at $p < 0.05$. **Results:** Mean IPS value found was 923 points (± 33), which corresponds to 27.61s in 25-m pool and 28.67s in 50-m pool. FI of F_{peak}, F_{avg}, RFD, ImpF and DUR was $18.3 \pm 7.9\%$, $21.6 \pm 6.9\%$, $26.9 \pm 8.8\%$, $18.6 \pm 6.7\%$ e $7.0 \pm 4.0\%$, respectively. Correlation coefficients found between IPS and FIs are presented in table. Results point that swimmers who have lower F_{avg} FI and/or RFD FI also have better performance.

	F _{peak} FI	F _{avg} FI	RFD FI	ImpF FI	DUR FI
IPS	-0.58	-0.76*	-0.76*	-0.64	0.68

* $p < 0.05$

Conclusion: There is a significant relationship between FI obtained in 30-s tethered swimming test and performance in 50m breaststroke. Therefore, it is necessary to identify training loads which can influence the maintenance of F_{avg} and RFD, and administrate them properly in periodization, considering these variables as moderators between competitive results successfulness and dominate muscle force characteristics in male sprint breaststrokers.

Keywords: Fatigue Index, Tethered Swimming, Breaststroke