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Biomechanical characterization of swimmers with physical disabilities

Valdir Junior^{1,2,3}, Alexandre Medeiros³, Kelly de Jesus⁴, Nuno Garrido⁵, Rui Corredeira⁶, Daniel J. Daly⁷, Ricardo J. Fernandes^{1,2*}

ORIGINAL ARTICLE

ABSTRACT

The evaluation of swimming technique is one of the main aspects to be considered in any training program, with biomechanics being an important source of knowledge. It was our objective to characterize the biomechanical parameters (SL and SF) relating them to the swimming velocity (v) at different intensities and to analyze within each swimming stroke cycle the intra-cyclic velocity variation (IVV) in a group of motor disabled swimmers. Eight disabled male swimmers (25.83 ± 2.93 years old, 72.45 ± 9.26 kg body mass and 1.79 ± 0.11 m of height) of the following functional classes: S6 ($n = 1$), S8 ($n = 2$) and S9 ($n = 5$) participated in this study. Swimmers were evaluated in the kinematic parameters v , stroke frequency (SF) and stroke length (SL) along with an incremental protocol of 6 x 200 m in the the crawl stroke. Data were registered in each step at the distances of 100 and 175 m. With increasing velocity, the mean values of SL decreased while the mean values of SF increased. To achieve higher swimming velocities, swimmers compensated the lack of the propulsive segment increasing SF to increase swimming speed. For the mean values of IVV at 100m distance, a decrease between the first and second levels, followed by a tendency to stabilize from the 2nd to the 6th level is presented. For the 175 m distance, there was a decrease in IVV with an increase in swimming velocity. Stroke frequency is directly related to the magnitude of IVV, which