研究業績　英文表記

和文	
表題	競泳の水中レジスタンストレーニングに関する一考察:クロール泳動作中の各ストローク局面の上肢筋群の筋放電分析に着目して.
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英文	
Title	Consideration of underwater resistance training during competitive swimming: EMG analysis of upper limb muscles in each stroke phase during crawl swimming
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Abstract	The purpose of this study was to gain knowledge regarding underwater resistance training. Underwater resistance training is performed to increase swimming power. This training was performed by towing items (such as a tube, bucket, or parachute). In this training it is ideal to use the same swimming technique as racing to increase swimming speed. However, there is a possibility that the technique used may be different from the intended technique. In this study, three different attempts were performed with maximum effort swimming in a 25-m crawl swim (including dragging an item with a parachute). The wireless surface electromyography Bio Log system (EMG Bio Log DL-5000; S&ME, Inc., Japan) was used, and an underwater digital camcorder (HX-WA 10; Panasonic) was used for the measurements at 60Hz from 10m to 25m in the trial from the left side (EMG: sampled at 1kHz frequency). Using an LED-type synchronizer (PH-105; DKH Inc.), the measurement was synchronized with the displacement measurement of each part of the body. The displacement of the visual marker attached to the subject's joint was converted by the two-dimensional DLT (Direct Linear Transformation) method. The EMG result of the main muscle group per unit time during the propulsion phase was higher when swimming normally than when the parachute was towed. Additionally, the swimming technique was impaired. Thus, towing items may not be an effective tool to increase muscle activity during underwater resistance training.
keyword	

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