

ELECTROMYOGRAPHY ANALYSE OF A PAIR OF FEMALE MONOZYGOTIC SWIMMERS: CASE OF STUDY

Conceição, A.^{1,2}; Fernandes, O.³; Costa, A.^{2,4}; Pereira, A.^{2,4}; Marques M.^{2,4}; Silva, A.^{2,5};
Louro, H.^{1,2}

Sports Sciences School of Rio Maior, Polytechnic Institute of Santarém, Portugal ¹

Research Centre for Sport, Health and Human Development (CIDESD), UTAD, Vila Real, Portugal²

University of Évora, Portugal³

University of Beira Interior, Covilhã, Portugal⁴

Department of C. of Sport, Exercise and Health of University of Trás-os-Montes and Alto Douro; Vila Real, Portugal ⁵

Summary

Introduction: Breaststroke technique is one of the least economic and to the impact biomechanics of the most obvious discontinuity: the accentuation of intra-cyclic horizontal velocity of displacement of center of mass of the body swimmer, that inertia, determine the necessity of performing an additional mechanical work to re-accelerate the body's center of mass, especially when the velocity drops below the average velocity. Being the techniques of electromyography (EMG) surface credible, though they should be implemented with the knowledge of the physiological and biomechanical mechanisms underlying the generation and propagation of electrical signals corresponding to the action potential (Merletti *et al.*, 2001).

Aim of the work: analyze through a case of study the muscles pattern activation during a 200m breaststroke (200mBr) in a pair of monozygotic swimmers.

Material and Methods: A female monozygotic (N=2) with the same national level swimming. Subjects (SW1 and SW2) performed a 200m breaststroke and were monitored through the muscular analysis with surface electromyography (EMG) recordings of the *pectoralis major*(*Pe*), *triceps brachii* (*Tr*), *deltoide anterior*(*Da*), *biceps brachii*(*Bc*) and *latissimus dorsi*(*Ld*) muscles.

Results: The *Da* is the muscle with a higher percentage in average terms of activation for the subject SW2 (88,71%±6,87), followed by the *Bc* in SW1(76,90%± 10,94). Correlation between both subjects for each muscle demonstrated that *Pe*, *Tr* and *Da* have different behavior of activation, unlike *Bc*(C=0,932, p=0,001) e *Ld*(C=0,944; p= 0,000) have a activation pattern similar. Comparing the muscle activation there is some statistical differences in *Tr* for both subjects (t= 2,428, p= 0,469).

Conclusions: The study seems that there are differences in the EMG pattern suggesting perhaps low heritability of this phenotype. In the future will be necessary a larger study.

Key words: Electromyography, Breaststroke, Monozygotic Twins; Swimming.