Ergometer and Dragon Boat

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Introduction

Dragon Boat is an activity that requires a participation of a large amount of muscles. The muscle groups involved are in order of involvement: the dorsal and abdominal muscles, biceps and triceps in the upper limbs and femoral quadriceps and gastrocnemius in the lower limbs. The athlete's muscle building is based on strengthening exercises with weight lifting that involves both upper and lower limbs, with a particular attention to the heart. The paddle position, the rotation and the twisting of the body is taken into account. Racing and boat outings are integrated into the preparation. However the paddling technique exercises have the limitation of being unilateral and therefore with the theoretical possibility of asymmetric muscle development on the side chose for paddling.

Methods

The propulsive thrust at the movement of Dragon Boat is given by the synchronous application of the force that must be exercised at the same time from all twenty athletes in order to allow the boat to slide on the water until the moment of a new immersion of the paddles and force application.

For this reason the strength applied by each individual athlete and the coordination of the technical movements of the entire crew are equally important.

A collaborator of our group adapted one kayak ergometer which, unlike those currently on the market, can be used in two different positions simulating perfectly the paddling conditions of Dragon Boat. The ergometer is based on mechanic resistance provided by fans that pose air resistance during movement.

Two single elastic bands start from the motor unit through a system of pulleys, ending in series at a handle of a paddle, creating two paddling positions mechanically independent, one on the right and one on the left. The resistance offered from the machine can be adjusted through the side opening of a bulkhead that allows to lighten the load during the training in the case of a single athlete or even to modify the resistance according to the athletes' strength.

The construction of a specific two seat ergometer for dragon boat, offers the possibility compensating the effect of the unilateral training performed on the boat. This way the hemi hypertrophy that inevitably is created by the long sessions of rowing in the water is compensated.[1]

Results and discussion

The advantage is mostly evident in young athletes introduced to the Dragon Boat, who are in risk of a unilateral specialization. The consequences of the hemi-hypetrophy become more and more evident with the increase of the muscle mass. This hemi-hypetrophy could also lead to alterations of the posture which can possibly inflict dorsal and lumbar muscle contractions and consequent pain. The use of a specific training instrument that can be used contralateral is more advantageous compared to the gymnastic compensatory sessions. It favors a greater athlete's adhesion in a more appropriate method for the chosen sport and certainly more acceptable in respect of the unilateral repetitive exercises, which are usually boring.

Furthermore, the use of the Dragon Boat ergometer allows to train at the gym, enhancing not only the strength and the speed, but also the paddling synchronization, even though it's limited to only two athletes. The synchronization of the various phases of paddling (attack, passing, extraction) is extremely important because the flow of collective movement permits a better sliding of the boat on the water surface, while, on the other hand, an imperfect synchronization leads to the breaking of the athletic movement resulting in an intermittent movement of the boat and a reduction of the maximum sliding velocity.

The ergometer training was very helpful for our team especially during the winter months allowing a specialized training of the athletes, even though the weather conditions don not permit training outside. It also aided the synchronized paddling, which helped the Italian crew that included 16 athletes of our club, to conquer the fourth place at the 2010 European Championship in 2000 meter distance.

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[1] Ho SR, Smith R, O'Meara D. Biomechanical analysis of dragon boat paddling: a comparison of elite and sub-elite paddlers. J Sports Sci. 2009 Jan 1;27(1):37-47.