

Biophysical changes in Aqua-Sky exercise with different musical cadences: instructors evaluation

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Introduction

The Aquatic Exercise Association (AEA, 2011) recommends music with a rhythm of 125-150 beats per minute ($b \cdot \text{min}^{-1}$), for water aerobic classes. Other authors suggest that for healthy and physically active subjects, the instructors should opt for rhythmic cadences between 136 and 158 $b \cdot \text{min}^{-1}$ (Barbosa et al., 2010).

Several studies aimed to assess the physiological responses during the execution of basic water aerobics exercises. However few are those that focused an instructor's perspective.

Therefore, the aim of the present study was to assess biophysical changes in Aqua-Sky at two different cadences.



Materials & Methods

Six aquatic fitness male instructors (29.3 ± 2.7 years-of-age; $\text{BMI } 25.0 \pm 2.5 \text{ kg} \cdot \text{m}^{-2}$; more than 3 years of experience) took part in the study.

Tests were performed on land, where the practical sessions of water aerobics take place. Each subject after a warm-up, completed two trials (30 min rest) of Aqua-Ski with different rhythmic cadencies ($130 b \cdot \text{min}^{-1}$ and $140 b \cdot \text{min}^{-1}$). Each trial had 6 min duration, permitting the stabilization of the physiological parameters studied. It was asked to the subjects to perform the exercise as in real class situation, according to the pattern recommended by the technical literature (AEA, 2011), and also mentioned in scientific work (Barbosa et al., 2010).

Heart rate was measured every 5 s (Polar). Blood lactate concentrations from the lobule of the left ear were measured with a portable device (Lactate-Pro) at two different moments: pre-test and post-test.

For the kinematical analysis a digital camera (Casio Exilim F1, 60fps) was placed on sagittal plane 3 meters from the area of execution. Calibration volume (3 m^3) was used to allow Utilius Easy Inspect (CCCsoftware) analysis. The distance between foot-supports was estimated using the digitalization of the anatomic reference point of the right medial malleolus when the foot was completely in contact with the floor for two moments (i) most posterior and (ii) most anterior.

Results

No significant differences in maximum and mean HR were obtained between repetitions ($p > 0.05$).

The $[\text{La}^-]$ showed a small increase with the rhythmic cadence of $140 b \cdot \text{min}^{-1}$.

Subjects maintained the amplitude of support, and consequently an increase in segmental velocity.

Conclusion

Similar results were verified in the analysis of other exercises (e.g. jumping-jacks and side-kicks). The increase in rhythmic cadence from $130 b \cdot \text{min}^{-1}$ to $140 b \cdot \text{min}^{-1}$ does not cause an acute physiological response in water aerobics instructors when practiced in the location where they administer their sessions.

Additionally, increase in movement rate keeping the same displacement, is the common procedure to higher cadences.

