Core muscle activation during aquatic resistance exercise performed with different devices.

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Core training is important to enhance spine stability, to prevent low back pain and to improve performance. The water environment has been shown to be safe and effective to rehabilitate low back disorders. Many different devices are used in aquatic resistance training. There are two kinds of devices: floating and drag, which may be of different sizes. However, the evidence for the effect of carrying out the maximum velocity of movement with different devices is scant.

Purpose

To compare core muscle activation during shoulder extension performed at maximum velocity with 4 different aquatic devices.

Methods

24 physically fit and healthy subjects (23.2 ± 1.18 years) took part in a randomized, within-subject design assessment. The maximum isometric voluntary contraction (MIVC) was evaluated for the normalization of the electromyographic measures. Rectus Abdominis (RA) and Lumbar Erector Spinae (LES) muscular activities were recorded and the maximum root mean square values were calculated for each condition. Surface electromyography was isolated and the activity was analyzed during shoulder extension of 3 repetitions performed with 4 aquatic devices: Drag Gloves (DG), Drag Wetshapers (DW), Floating Dumbells (FD) and Floating Wristbands (FW). All values were expressed as the %EMG and compared using Analysis of Variance (ANOVA) with repeated measures. Significance level was set at $p<0.05$.

Results

There were no significant differences between the performance of the aquatic exercise in the four conditions (DW, DG, FD and FW) for both muscles, RA ($p = 0.132$) and LES ($p=0.230$) (Graph 1).

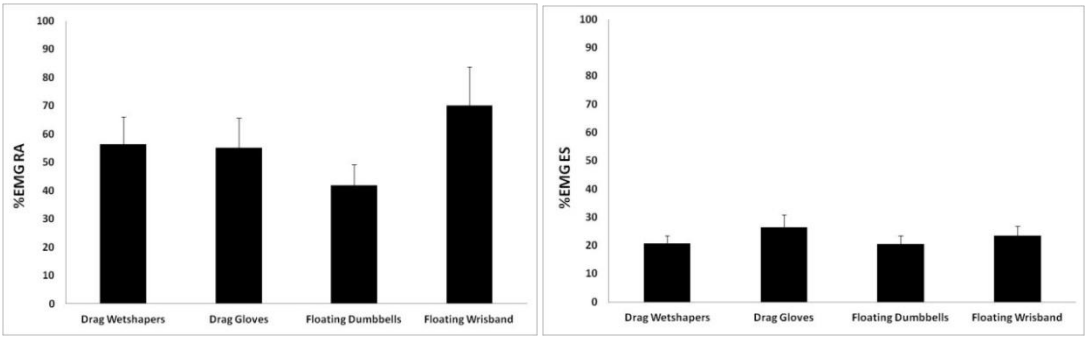
Conclusion

The core muscle activation was the same, independent of the use of one device or another.

Practical Application

Bigger devices are not the best choice to increase core muscle activation in the water environment. Floating and drag devices are both feasible, however, drag devices

present great advantages for resistance training, for example, they allow the implication of a greater number of muscle groups with a smaller number of movements. Applying the maximal velocity of movement is more important than the size and kind of the additional device, thus, the maximum velocity of movement seems to be the best strategy to optimize the neuromuscular activity.



Graph 1: Percentage of maximum muscle activation of rectus abdominis (%EMG RA) and lumbar erector spinae (%EMG LES)