

EMG Activation During a Functional Dryland Exercise for Butterfly Swimmers

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ABSTRACT

Our previous randomized controlled trial implemented a novel dryland exercise designed to strengthen the recovery phase of the butterfly stroke. Participants were split into two groups: Exercise (EX), which performed the exercise 3x per week, consisting of 2 sets until muscular failure, and Control (CON) which did not perform any additional training. EX displayed significantly improved Muscle Oxygenation (SmO₂) characteristics of the posterior deltoid during a 100-yard butterfly swim, as measured by MOXY Sensors. **PURPOSE:** To evaluate the muscle activation patterns of the PD and TT during the butterfly dryland exercise. Furthermore to determine, after four months of detraining, if the exercise induced lasting alterations in the PD and TT muscle synergies that are specific to athletes previously in the EX group. **METHODS:** Three Division 1 butterfly swimmers who had previously performed the exercise protocol (EX) and two who had not performed the movement (NEW) performed the exercise until muscular failure or two minutes, whichever was first. EMG measurements were collected using Cometa wireless sensors on the participant's dominant side's PD and TT. This study has been approved by the IRB. **RESULTS:** During the dryland exercise, the EX group displayed an average 37.58% higher activation in the PD relative to TT, while NEW had an average 1.59% lower activation comparing the same muscles. There is a statistically significant difference ($p < 0.01$) between EX and NEW PD bias. **CONCLUSION:** Previous exposure to the exercise protocol is capable of shifting the movement's muscle activation patterns to a more PD-dominant profile. A larger sample size is needed to strengthen these results.