INSPIRATORY MUSCLE TRAINING DOES NOT REDUCE EXERCISE-INDUCED ARTERIAL HYPOXEMIA IN MALE ROWERS

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Reductions in arterial pressure and saturation of O2 (SaO2) seem to be consistent findings in response to maximal ergometer rowing (Nielsen, 2003). We have shown that six weeks of inspiratory muscle training (IMT) may increase SaO2 and rowing performance in highly trained female rowers that exhibited severe exercise induced arterial hypoxemia (EIAH) (Vrabas et al., 2007). The purpose of this study was to examine the effects of specific IMT on end-exercise arterial O2 saturation (SaO2), lung function at rest and rowing performance in highly-trained male rowers that exhibited EIAH (SaO2: < 92%). Twenty highly-trained male rowers that exhibited EIAH (SaO2: < 92%), were divided into two groups: IMT (T; n=10 age: 19.22±0.57 yrs, training age: 5.39±0.58yrs, weight: 80.67±2.89 kg, height: 180.77±1.79 cm) and control (C; n=10 age: 19.44±0.85 yrs, training age: 5.83±1.08 yrs weight: 78.71±1.83 kg, height: 181.94±2.47 cm). T group, in addition to their daily rowing practice, performed IMT by means of a threshold inspiratory muscle trainer (POWER breathe®, IMT Technologies Ltd., Birmingham, UK) for 0.5hd-1, 5 times a week for six weeks. C group participated only in their regular daily rowing training. Prior to the initiation and at the completion of the 6 week IMT program, on three separate occasions both groups underwent: a) an incremental rowing ergometer test (Concept Iic, Nottingham, UK; Oxycon-pro, Jaeger, Wurzburg, Germany) b) a rowing ergometer 2000m all-out effort and c) a rowing ergometer 5 minute all-out effort without prior warm-up. Lung function was measured at rest. Six weeks of IMT significantly (p<0.05) increased PImax from (Mean ± SEM) 131.61±12.04 to 183.27±8.00 (cmH20), FEF50 from 6.15±0.42 to 6.56±0.29 (L.sec-1), MVV12 from 167.66±6.18 to 190.22±5.93 (L.min-1), FVC from 5.42±0.26 to 5.82±0.21 (L), VE from 173.11±5.86 to 177.55±6.16 (L.min-1) and decreased Di from 0.93±0.03 to 0.88±0.03. IMT also increased VT ex from 2.83±0.10 to 3.16±0.13 (L), VT in 2.78±0.10 to 3.05±0.09, Bl from 66.22±1.16 to 69.44±1.59 (b.min-1) and reduced Di from 1.17±0.04 to 1.12±0.03, but did not affect SaO2, during the 2000m all-out effort in the T group. Moreover, IMT significantly (p<0.05) increased rowing distance from 1512.11±14.68 to 1540.55±13.97 (m) during the 5 minute all-out effort without prior warm-up in the T group. In contrast, no changes in PImax or any other parameter measured were observed in the C group during the six week period. These results indicated that IMT did not alleviate the EIAH phenomenon in male rowers, demonstrating differential mechanisms between the two sexes.

References
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