Respiratory muscle endurance training reduces the O_2 cost of cycling and perceived exertion in obese adolescents.

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In obesity, the increased O_2 cost of breathing negatively affects the O_2 cost of exercise and exercise tolerance. The purpose of the study was to determine whether, in obese adolescents, the addition of respiratory muscle endurance training (RMET) (isocapnic hyperpnea) to a standard body mass reduction program decreases the O_2 cost of exercise and perceived exertion. Nine male obese adolescents [16.0 ± 1.4 yr (x ± SD), body mass 114.4 ± 22.3 kg] underwent 3 wk of RMET (5 days/week) in addition to a standard body mass reduction program. Eight age- and sex-matched obese adolescents underwent only the standard program (CTRL). Before and after interventions, patients performed on a cycle ergometer: incremental exercise; 12-min exercises at a constant work rate (CWR) of 65% and 120% at the gas exchange threshold (GET) determined before the intervention. Breath-by-breath pulmonary ventilation ($\dot{V}_E$) and O_2 uptake ($\dot{V}_{O_2}$), heart rate (HR), and ratings of perceived exertion for dyspnea/respiratory discomfort (RPE_R) and leg effort (RPE_L) were determined. Body mass decreased (by ~3.0 kg) after both RMET (P = 0.003) and CTRL (P = 0.002). Peak $\dot{V}_{O_2}$ was not affected by both interventions. Peak work rate was slightly, but significantly (P = 0.04), greater after RMET but not after CTRL. During CWR < GET, no changes were observed after both interventions. During CWR > GET, the O_2 cost of cycling at the end of exercise (P = 0.02), the slope of $\dot{V}_{O_2}$ vs. time (3–12 min) (P = 0.01), RPE_R (P = 0.01), and RPE_L (P = 0.01) decreased following RMET, but not following CTRL. HR decreased after both RMET (P = 0.02) and CTRL (P = 0.03), whereas $\dot{V}_E$ did not change. In obese adolescents RMET, superimposed on a standard body mass reduction program, lowered the O_2 cost of cycling and perceived exertion during constant heavy-intensity exercise.