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Applied Sciences

Respiratory Muscles, Exercise Performance, and Health in Overweight and Obese Subjects

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Abstract

Purpose: Overweight and obese subjects often perceive increased breathlessness during minor exertion and therefore avoid exercise. Respiratory muscle endurance training (RMET) can reduce the perception of breathlessness. We hypothesized that RMET 1 month before and during a 6-month (3 months supervised + 3 months unsupervised) exercise and nutrition counseling program (EN) would improve the benefits of EN.

Methods: Twenty-six overweight and obese subjects with significant perception of breathlessness during exercise (age = 33 ± 9 yr, body mass index (BMI) = 31.3 ± 4.9 $kg \cdot m^{-2}$) were randomized to RMET+EN (R+EN) or EN alone. R+EN performed 30 min of normocapnic hyperpnea 5 wk^{-1} before and 2 wk^{-1} during EN. EN consisted of two strength and three endurance training sessions per week, as well as prescribed nutritional composition and a 2.1-kJ (500-kcal) energy deficit per day. Both groups had an equal number of laboratory visits during the 7 months. Before and after 4 and 7 months, subjects performed a 12-min time trial (TT; 6 + 6 min, 2-min pause) and an incremental cycling test (ICT) to exhaustion, and blood lipids were assessed.

Results: Weight loss was significant and similar in both groups (−4.2 vs −3.7 kg; both $P < 0.05$). During the first 4 months, distance covered in 12 min improved more ($P < 0.05$) with R+EN (1678 vs 1824 m; $P < 0.001$) than with EN alone (1638 vs 1698 m; $P < 0.05$), whereas after R+EN, breathlessness during the ICT was reduced. Blood lipids of the pooled group improved in those subjects with pathologic values before the study. Despite reduced training compliance during the unsupervised period, subjects of both groups maintained the benefits attained during the supervised period.

Conclusions: R+EN improved TT performance more than EN alone, despite similar weight loss, possibly owing to the reduced perception of breathlessness.