GH responses to 2 consecutive bouts of respiratory muscle endurance training in obese adolescents and adults.

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Repeated bouts of GH-releasing stimuli (both pharmacological and physiological, such as aerobic exercise) at 2-h intervals are associated with a blunting of somatotropic responsiveness in normal adults, while a persistent GH responsiveness to consecutive stimuli is reported to occur in children and adolescents. Recently, a single bout of respiratory muscle endurance training (RMET) by means of a specific commercially available device (Spiro Tiger®) has been shown to induce relevant GH responses in both normal-weighted and obese adult subjects. The aim of the present study was to evaluate GH responses to repeated bouts of RMET in obese adolescents and adults. Seven obese male adolescents (age: 15.7±0.4 years; body mass index, BMI: 38.0±3.3 kg/m^2) and 10 obese adults (age: 22.2±1.4 years; BMI: 39.9±1.0 kg/m^2) underwent an incremental progressive RMET protocol of 11 daily sessions. Blood samplings for GH determinations were collected during the 12th session, which was composed of 2 consecutive bouts of RMET (of identical intensity and duration: 1 min at a respiration rate of 28 acts/min, 5 min at 32 acts/min, 5 min at 34 acts/min, 4 min at 36 acts/min) at a 2-h interval in-between. Baseline GH levels significantly increased after the first bout of RMET in all subjects, higher GH peaks being found in obese adults than in obese adolescents (peaks: 14.3±2.1 ng/ml vs. 4.8±1.6 ng/ml, respectively, $p<0.05$). The administration of the second bout of RMET resulted in significantly lower ($p<0.05$) GH increases in both obese adolescents and obese adults (peaks: 0.9±0.2 ng/ml and 1.6±0.2 ng/ml, respectively) in comparison with the first one. In conclusion, exercise protocols based on repeated bouts of RMET do not seem a valid strategy to persistently stimulate GH-IGF-1 release in obese adolescents, since GH responses to a single bout are actually modest in comparison with those of obese adults and completely abolished after repeated bouts at 2 h interval in-between.