GH and cortisol responses following an acute session of respiratory muscle endurance training in severely obese patients.

A. Sartorio, F. Agosti, A. Patrizi, A. Gattico, G. Tringali, M. Giunta, E.E. Muller, A.E. Rigamonti

Hormone & Metabolic Research 45: 239-244, 2013.

It is well established that obese patients are hypo-responsive to classical GH-releasing stimuli, including aerobic exercise. Recently, we have demonstrated that whole body vibration was able to markedly stimulate GH secretion in obese patients, thus suggesting that this refractoriness is not absolute but dependent on the GH-releasing stimulus. Furthermore, we have shown the ability of a respiratory muscle endurance training (RMET) to stimulate GH and cortisol secretion in healthy subjects. The objective of this study was to evaluate the effects of RMET on GH and cortisol responses in severely obese patients. Eight severely obese patients (4 M/4 F, mean age ± SEM: 22.8 ± 1.6 years, body mass index, BMI: 39.9 ± 1.1 kg/m^2) underwent an incremental progressive RMET protocol of 11 daily sessions, obtained through the use of a specifically designed respiratory device (Spiro Tiger ®). The 12th session of RMET (15 min 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) was associated with blood samplings for determination of GH, cortisol, and lactate (LA) levels. An age- and sex-matched normal-weighted control group (n = 7, 4 M/3 F, age: 26.1 ± 3.1 years, BMI: 22.4 ± 0.6 kg/m^2) was also recruited. In both normal-weighted subjects and obese patients, GH secretion significantly increased after a 15-min RMET session. Although serum GH levels at 30 min were higher in normal-weighted subjects than in obese patients, there was no statistically significant difference in either GH peaks or net GH areas under the curve between the 2 groups. RMET significantly increased serum cortisol levels in normal-weighted subjects, but was associated to a progressive cortisol decline in obese patients. RMET stimulated LA production, with no significant differences in normal-weighted subjects and in obese patients. A 15-min RMET session was capable to induce a GH response in severely obese patients, which was comparable to that recorded in normal-weighted subjects. A progressive decline in serum cortisol levels occurred in obese patients after RMET, while an opposite pattern (i.e., a signify cant cortisol increase) was found in normal-weighted subjects. Optimization of long-term RMET protocols could represent a valid strategy to (physiologically) stimulate GH/IGF-I system in those GH hyposecretory states such as obesity.