GH responses to whole body vibration alone or in combination with maximal voluntary contractions in obese male adolescents.

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Background: The anabolic, lipolytic and anti-inflammatory effects of exercise-stimulated GH secretion could be usefully exploited in the multidisciplinary rehabilitative programs of obese patients, who are reported to suffer from hyposomatotropism. To date, evaluation of GH responses to whole body vibration (WBV) in combination with maximal voluntary contractions (MVC) has been performed in normal-weight subjects, but not obese patients. Thus, aim of the present study was to investigate the effects of WBV and MVC, alone and combined, on GH responsiveness in obese subjects.

Methods: The acute effects of WBV or MVC alone and the combination of MVC with WBV (MVC+WBV) on serum GH, cortisol and IGF-I and blood lactate (LA) levels were evaluated in 8 obese male adolescents [mean age ± SD: 17.1 ± 3.3 yrs.; weight: 107.4 ± 17.8 kg; body mass index (BMI): 36.5 ± 6.6 kg/m^2; BMI standard deviation score (SDS): 3.1 ± 0.6].

Results: WBV and MVC (alone or combined) significantly stimulated GH secretion. In particular, GH peaks and net areas under the curve (nAUCs) were significantly higher after MVC+WBV and MVC than WBV, without any difference between MVC+WBV and MVC groups; anyway, an additive effect on GH levels immediately after the execution of MVC+WBV test was found in comparison with MVC test. LA peaks significantly increased after each exercise (vs. basal condition), being significantly higher after MVC+WBV and MVC than WBV, without any difference between MVC+WBV and MVC groups. Peak LA values were significantly correlated with GH peaks and nAUCs. In contrast to the unchanged IGF-I levels, MVC+WBV and MVC (but not WBV) significantly stimulated cortisol secretion.

Conclusions: The results of the present study confirm the ability of MVC and WBV to stimulate GH secretion in obese patients. Rehabilitative programs combining different types of exercise eliciting a potent GH response seem to be important to counteract the hyposomatotropism of obese patients. Due to its limited stress upon joints without provoking an excessive fatigue, WBV could be usefully employed in the initial stages of a weight loss program alone or in combination with more potent GH releasing stimuli, such as MVC.