

## **Growth hormone and lactate responses induced by maximal isometric voluntary contractions and whole-body vibrations in healthy subjects.**

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Background: In contrast with maximal voluntary resistance exercise, which is allegedly considered a potent growth hormone (GH) stimulus in young subjects, evaluation of GH response to whole-body vibrations (WBV) has yielded conflicting results.

Methods: The acute effects of WBV alone (test A), maximal voluntary isometric contractions (MVC) (test B), and combination of WBV and MVC (test C) on serum GH and blood lactate (LA) levels were studied in 9 healthy adult males. Muscle soreness was assessed 24 and 48 hours after exercise by a visual analogue scale.

Results: GH responses were significantly higher after tests B and C than after test A (GH peaks:  $18.8 \pm 9.5$  ng/ml or  $20.8 \pm 13.7$  ng/ml, respectively, vs.  $4.3 \pm 3.5$  ng/ml;  $p < 0.05$ ), with no difference between tests B and C. LA concentrations significantly increased after test A, B and C, being significantly higher after tests B and C than test A (LA peaks:  $2.0 \pm 0.5$  mmol/l or  $6.7 \pm 2.3$  mmol/l, respectively, vs.  $7.6 \pm 0.9$  mmol/l;  $p < 0.05$ ). Peak LA values were significantly correlated to GH peaks in the 3 tests ( $r = 0.48$ ;  $p < 0.05$ ). Muscle soreness was significantly higher 24-48 hour after tests B and C than after test A, no significant differences being present between tests B and C.

Conclusions: WBV stimulates GH secretion and LA production, with no additive effect when combined with repeated isometric voluntary contractions. Optimization of protocols based on WBV seems important

to maximize the positive effects of this intervention on the somatotropic function.

Se desidera avere la fotocopia di questo lavoro, per esclusivo uso personale, può fare richiesta per mail a: [info@cresceresani.it](mailto:info@cresceresani.it) indicando il titolo, gli autori, la rivista e il proprio recapito lavorativo (nome, cognome, indirizzo, CAP, città).