ENHANCED METABOLIC STRESS INCREASES GROWTH HORMONE SECRETION AFTER RESISTANCE EXERCISE

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Backgrounds: Resistance exercise is a potent stimulus for adjusting hormonal secretions (1). Although blood concentrations of anabolic and catabolic hormones (e.g., growth hormone, testosterone, cortisol,) increase markedly after resistance exercise (2), a major factor for inducing hormone secretions remains unclear. Interestingly, recent studies indicate that low-intensity resistance exercise with moderate vascular occlusion strongly stimulates exercise-induced growth hormone release (3, 4), suggesting that metabolites accumulation within working muscles is associated with enhanced growth hormone secretion. Therefore, we examined the effects of enhanced metabolic stress caused by post-exercise cuff pressure on acute hormonal responses to resistance exercise.

Methods: Eight young men performed three trials: 1) resistance exercise only (Ex), 2) resistance exercise with post-exercise cuff pressure (ExCuff), and 3) cuff pressure only (Cuff). Resistance exercise consisted of 3 sets of bilateral leg extension exercise at approximately 60% of one-repetition maximum (1-min rest between sets). In the ExCuff trial, 5-min of cuff pressure (both legs at 100-150 mmHg) was conducted immediately after the resistance exercise. The exercise intensity and number of repetitions in each set were matched between the Ex and ExCuff trials. Blood samples were collected before and during 60-min of recovery period.

Results: Resistance exercise increased blood lactate, epinephrine, norepinephrine, and cortisol concentrations (P < 0.05). However, the responses of growth hormone and cortisol were stronger in the ExCuff trial than in the Ex trial (P < 0.05). No difference was observed in norepinephrine response between the Ex and ExCuff trials. Cuff trial showed no increase in blood metabolites and hormone concentrations.

Conclusions: Although Ex and ExCuff trials performed resistance exercise with same intensity and number of repetitions, the exercise-induced growth hormone and cortisol responses were clearly different. These results suggest that enhanced intramuscular metabolic stress caused by post-exercise cuff pressure increases growth hormone and cortisol secretions.

References

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