The Acute Hormonal Response to Free Weight and Machine Weight Resistance Exercise

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Abstract

Resistance exercise can acutely increase the concentrations of circulating neuroendocrine factors, but the effect of mode on this response is not established. The purpose of this study was to examine the effect of resistance exercise selection on the acute hormonal response using similar lower-body multijoint movement free weight and machine weight exercises. Ten resistance trained men (25 ± 3 years, 179 ± 7 cm, 84.2 ± 10.5 kg) completed 6 sets of 10 repetitions of squat or leg press at the same relative intensity separated by 1 week. Blood samples were collected before (PRE), immediately after (IP), and 15 (P15) and 30 minutes (P30) after exercise, and analyzed for testosterone (T), growth hormone (GH), and cortisol (C) concentrations. Exercise increased ($p \leq 0.05$) T and GH at IP, but the concentrations at IP were greater for the squat (T: 31.4 ± 10.3 nmol·L−1; GH: 9.5 ± 7.3 µg·L−1) than for the leg press (T: 26.9 ± 7.8 nmol·L−1; GH: 2.8 ± 3.2 µg·L−1). At P15 and P30, GH was greater for the squat (P15: 12.3 ± 8.9 µg·L−1; P30: 12.0 ± 8.9 µg·L−1) than for the leg press (P15: 4.8 ± 3.4 µg·L−1; P30: 5.4 ± 4.1 µg·L−1). C was increased after exercise and was greater for the squat than for the leg press. Although total work (external load and body mass moved) was greater for the squat than for the leg press, rating of perceived exertion did not differ between the modes. Free weight exercises seem to induce greater hormonal responses to resistance exercise than machine weight exercises using similar lower-body multijoint movements and primary movers.