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Poster presentation

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Acute supplementation with alpha-glycerylphosphorylcholine augments growth hormone response to, and peak force production during, resistance exercise

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Background

Many of the positive adaptations resulting from resistance exercise training (i.e., increased muscle mass and strength, decreased fat mass) are thought to be mediated, in part, by exercise-induced increases in growth hormone (GH). One ingredient that has shown clinical promise in elevating GH is the acetylcholine precursor alpha-glycerylphosphorylcholine (A-GPC). The purpose of this study was to examine the effects of a supplement containing primarily A-GPC on serum GH levels, explosive performance, and post-exercise substrate oxidation.

Methods

Using a randomized, placebo-controlled, crossover design, seven men (mean ± SD age, height, weight, body fat: 30.1 ± 7.3 y, 179.2 ± 7.4 cm, 87.3 ± 11.6 kg, 18.1 ± 5.9%) with at least two years of resistance training experience ingested 600 mg A-GPC (as AlphaSize™) or a placebo 90-minutes prior to completing 6 sets × 10 repetitions of Smith Machine squats at 70% of their pre-determined 1-repetition maximum. At 30-minutes post-exercise, resting metabolic rate (RMR) and respiratory exchange ratio (RER) were measured with indirect calorimetry to assess post-exercise caloric expenditure and carbohydrate and fat oxidation, respectively. Immediately following RMR and RER measurements, subjects performed three sets of bench press throws at 50% of their pre-determined 1-repetition maximum to assess peak force, peak power, and rate of force development. All trials were performed after an overnight fast, a 48-hour abstention from intense exercise, and during the same time of day to minimize diurnal variation. Serum samples were obtained prior to exercise and again 0, 5, 15, 30, 60, 90 and 120 minutes post-exercise. Hormone concentrations were analyzed in duplicate by Quest Diagnostics® via immunoassay. Statistical evaluation of the data was accomplished using dependent t-tests (peak force, peak power, rate of force development) and repeated measures ANOVA (GH, RMR, RER). Differences were considered "significant" at $P \leq 0.05$.

Results

Compared to baseline (pre) values, peak GH increased 44-fold during A-GPC (from 0.19 ± 0.06 to 8.4 ± 2.1 ng/mL) vs. 2.6-fold during placebo (from 1.9 ± 0.8 to 5.0 ± 4.8 ng/mL, $P < 0.03$) (Figure 1). Peak bench press force was 14% greater in A-GPC (933 ± 89 N) vs. placebo (818 ± 77 N, $P < 0.02$). Trends toward higher peak bench press power ($P < 0.13$) and lower post-exercise RER ($P < 0.12$) were noted in the A-GPC trial.

Conclusion

These data indicate that a single 600 mg dose of A-GPC (as AlphaSize™), when administered 90 minutes prior to resistance exercise, increases post-exercise serum GH and peak bench press force. In contrast, A-GPC had no statistically significant effect on peak power, rate of force development, RMR, or cardiovascular hemodynamics (i.e., heart rate and blood pressure). Future work should exam-

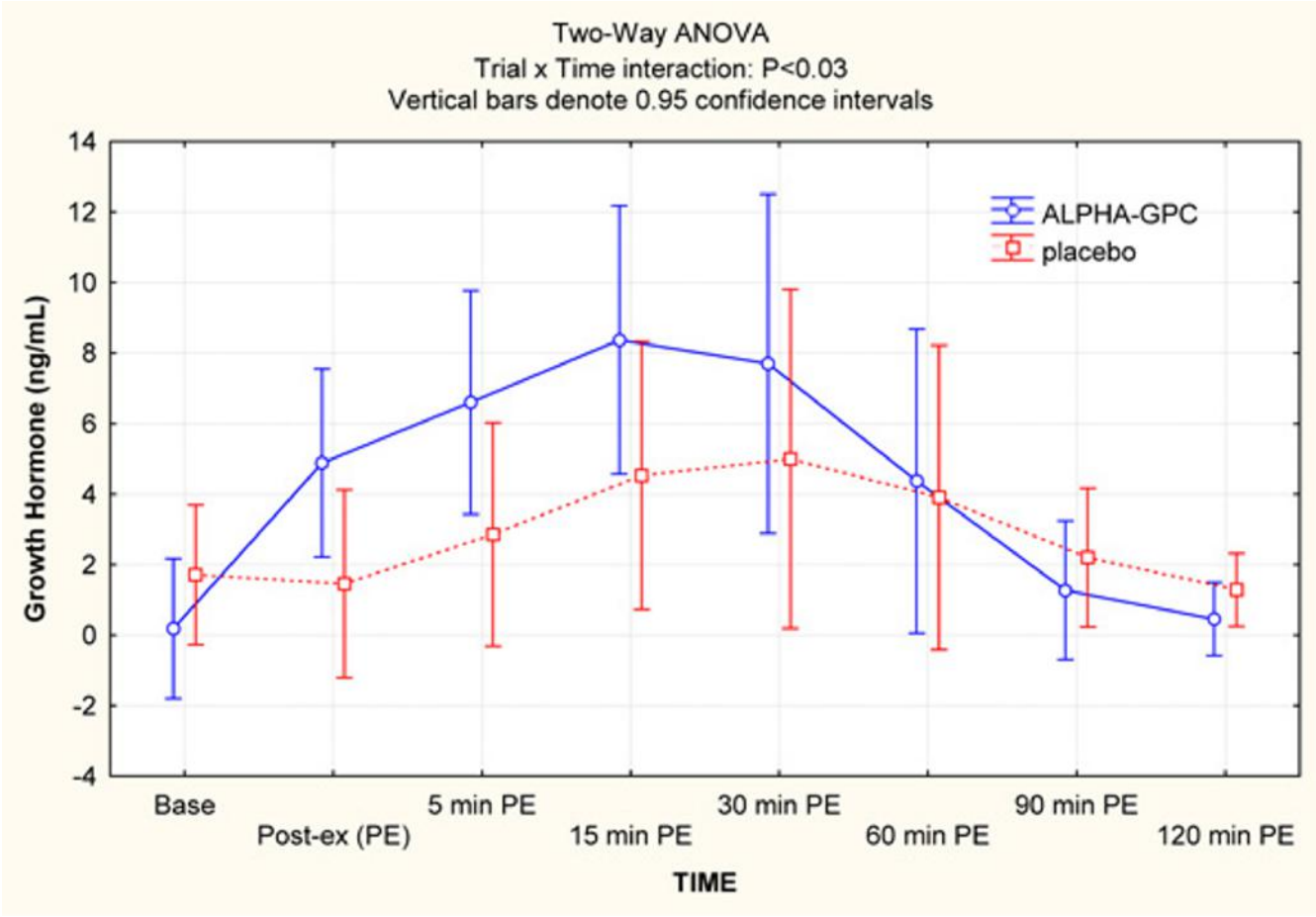

Figure 1

ine how resistance exercise + A-GPC affect the GH-IGF axis and their associated family of binding proteins.

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