The effects of four weeks of ribose supplementation on body composition and exercise performance in healthy, young, male recreational bodybuilders: a double-blind, placebo-controlled trial

ABSTRACT

BACKGROUND

Ribose is a pentose sugar that is present in ribonucleic acids, riboflavin, nucleotides, and adenosine triphosphate. Whether exogenous ribose administration affects skeletal muscle concentrations of total adenine nucleotides is unknown. Whether supplementation with ribose positively affects body composition or exercise performance in recreational bodybuilders also is unknown.

OBJECTIVE

The purpose of this double-blind, placebo-controlled trial was to determine the effects of 4 weeks of ribose supplementation on body composition and exercise performance in healthy, young, male recreational bodybuilders.

METHODS

Healthy, male recreational bodybuilders aged 18 to 35 years were recruited and randomized to a ribose-supplemented group (10 g/d in powder formulation) or a placebo group (dextrose). Each subject participated in a heavy-resistance training program designed to increase skeletal muscle mass. Body composition (ie, body weight, body fat, lean body mass, fat mass, and bone mineral content) was assessed using dual-energy x-ray absorptiometry analysis. Muscular strength (as measured by a 1-repetition maximum-strength [1-RM] bench press) and total work performed (as measured by total repetitions for 10 sets of bench presses before muscular failure; 1-minute resting interval between sets) to muscular failure at a submaximal load (100% of pretest body weight) were ascertained. In addition, 24-hour dietary recalls were obtained before and after the study.

RESULTS

Twenty men (mean age ± SE, 23.9 ± 1.4 years) were enrolled; 19 subjects completed 24-hour dietary recalls and exercise performance testing; 12 subjects completed the study (24-hour dietary recalls, exercise performance, and body composition). No baseline differences were found between the 2 groups for any of the measured parameters. The ribose-supplemented group experienced a significant pretreatment-to-posttreatment increase in the total work performed, whereas the placebo group did not change significantly (24.5 ± 7.6 to 29.3 ± 7.5 repetitions; 19.6% ribose [$P = 0.028$] vs 34.1 ± 8.6 to 38.2 ± 8.0 repetitions, 12.0% placebo). In addition, the ribose-supplemented group

experienced a significant increase in 1-RM bench press strength, whereas the placebo group did not change significantly (114.1 ± 13.6 to 117.7 ± 14.0 kg, 3.2% ribose [P = 0.008] vs 129.6 ± 14.2 to 131.8 ± 14.5 kg, 1.7% placebo). No pretreatment-to-posttreatment within-group or between-group differences were found for any of the measures of body composition or the 24-hour dietary data.

CONCLUSION

The results of this study indicate that supplementation with ribose 10 g/d for 4 weeks resulted in significant increases in muscular strength and total work performed in recreational bodybuilders in this study, although no significant changes in body composition or 24-hour dietary data were found.