Abstract


No effect of antioxidant supplementation on muscle performance and blood redox status adaptations to eccentric training.

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BACKGROUND: It was recently reported that antioxidant supplementation decreases training efficiency and prevents cellular adaptations to chronic exercise.

OBJECTIVE: This study aimed to investigate the effects of vitamin C and vitamin E supplementation on muscle performance, blood and muscle redox status biomarkers, and hemolysis in trained and untrained men after acute and chronic exercise. A specific type of exercise was applied (eccentric) to produce long-lasting and extensive changes in redox status biomarkers and to examine more easily the potential effects of antioxidant supplementation.

DESIGN: In a double-blinded fashion, men received either a daily oral supplement of vitamin C and vitamin E (n = 14) or placebo (n = 14) for 11 wk (started 4 wk before the pretraining exercise testing and continued until the posttraining exercise testing). After baseline testing, the subjects performed an eccentric exercise session 2 times/wk for 4 wk. Before and after the chronic eccentric exercise, the subjects underwent one session of acute eccentric exercise, physiologic measurements were performed, and blood samples and muscle biopsy samples (from 4 men) were collected.

RESULTS: The results failed to support any effect of antioxidant supplementation. Eccentric exercise similarly modified muscle damage and performance, blood redox status biomarkers, and hemolysis in both the supplemented and nonsupplemented groups. This occurred despite the fact that eccentric exercise induced marked changes in muscle damage and performance and in redox status after exercise.

CONCLUSION: The complete lack of any effect on the physiologic and biochemical outcome measures used raises questions about the validity of using oral antioxidant supplementation as a redox modulator of muscle and redox status in healthy humans.

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