Modulation of muscle damage and oxidative stress by taurine supplementation after eccentric exercise

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Introduction: Studies had shown the association between oxidative stress and soreness and/or strength muscle loss after exercise. Antioxidant supplementation can attenuate damage muscle. The aim of the study was to investigate the effects of taurine supplementation on muscle performance and oxidative stress after eccentric exercise (EE) in males.

Material and Methods: Twenty-one participants with mean age of 21 ± 6 years, weight of 78.2 ± 5 kg, and height of 176 ± 7 cm were selected and randomly divided into two groups: placebo (n=10) and taurine (n=11). Fourteen days after starting supplementation, subjects performed EE (3 sets until exhaustion with elbow flexion and extension on the Scott bench, 80% 1RM). Blood samples were collected and muscle performance was measured on the 1st, 14th, 16th, 18th, and 21st days after starting supplementation. Then, performance tests, muscle damage and oxidative stress markers were analyzed.

Results and Discussion: The results showed a statistically significant decrease in muscle soreness, muscular fatigue, lactate dehydrogenase and creatine kinase activities, lipoperoxidation and protein carbonyl in the taurine-supplemented group compared to the placebo group. Moreover, taurine-supplemented group increased total thiol content, superoxide dismutase, catalase and glutathione peroxidase activities compared to placebo group. Taurine has been shown increase force production by increasing the Ca²⁺ release from the sarcoplasmic reticulum and increasing the sensitivity of the contractile filaments to Ca²⁺.

Conclusion: The results suggest that taurine supplementation represents an important factor in improving performance and decreasing muscle damage and oxidative stress in males.

Keywords: eccentric exercise, oxidative stress, taurine.

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