

Abstract

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Effect of vitamin C supplementation on lipid peroxidation, muscle damage and inflammation after 30-min exercise at 75% v.o(2max).

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AIM: Hypothetically, supplementation with the antioxidant vitamins C could alleviate exercise-induced lipid peroxidation. The purpose of this study was to evaluate the effect of vitamin C supplementation on exercise-induced lipid peroxidation, muscle damage and inflammation.

METHODS: Sixteen healthy untrained male volunteers participated in a 30-min exercise at 75% Vo2max. Subjects were randomly assigned to one of two groups: 1) placebo and 2) vitamin C (VC: 1 000 mg vitamin C). Blood samples were obtained prior to supplementation (baseline), 2 h after supplementation (immediately pre-exercise), post-exercise, 2 and 24 h after exercise. Plasma levels of VC, total antioxidant capacity (TAC), creatine kinase (CK), malondealdehyde (MDA), total leukocytes, neutrophils, lymphocytes, interleukin-6 (IL-6) and cortisol were measured.

RESULTS: Plasma vitamin C concentrations increased significantly in the VC in response to supplementation and exercise ($P < 0.05$). TAC decreased significantly in Placebo group 24 h after exercise compared to pre-exercise ($P < 0.05$). Although MDA levels were similar between groups at baseline, it increased significantly 2 h after exercise only in the Placebo group ($P < 0.05$). CK increased immediately and 2 h after exercise in both groups and 24 h after exercise only in placebo group compared to pre-exercise ($P < 0.05$). Markers of inflammation (total leukocyte counts, neutrophil counts and IL-6) were increased significantly in response to the exercise ($P < 0.05$). In VC group, there was significant increase in lymphocyte counts immediately after exercise compared with pre-exercise ($P < 0.05$). Serum cortisol concentrations significantly declined after supplementation compared with baseline ($P < 0.05$) as well as declined 2 and 24 h after exercise compared with immediately after exercise in VC group ($P < 0.05$).

CONCLUSION: VC supplementation prevented endurance exercise-induced lipid peroxidation and muscle damage but had no effect on inflammatory markers.

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