Abstract


Antioxidant supplementation prevents exercise-induced lipid peroxidation, but not inflammation, in ultramarathon runners.

Mastaloudis A, Morrow JD, Hopkins DW, Devaraj S, Traber MG.

Departments of Exercise and Sport Science, Oregon State University, Corvallis, OR 97731, USA.

OBJECTIVE: To determine if 6 weeks of supplementation with vitamins E and C could alleviate exercise-induced lipid peroxidation and inflammation, we studied 22 runners during a 50 km ultramarathon.

METHODS: Subjects were randomly assigned to one of two groups: (1) placebos (PL) or (2) antioxidants (AO: 1000 mg vitamin C and 300 mg RRR-alpha-tocopheryl acetate). Blood samples were obtained prior to supplementation (baseline), after 3 weeks of supplementation, 1 h pre-, mid-, and postrace, 2 h postrace and for 6 days postrace. Plasma levels of alpha-tocopherol (alpha-TOH), ascorbic acid (AA), uric acid (UA), F2-isoprostanes (F2-IsoPs), tumor necrosis factor alpha (TNF-alpha), interleukin-6 (IL-6), and C-reactive protein (CRP) were measured.

RESULTS: With supplementation, plasma alpha-TOH and AA increased in the AO but not the PL group. Although F2-IsoP levels were similar between groups at baseline, 28 +/- 2 (PL) and 27 +/- 3 pg/ml (AO), F2-IsoPs increased during the run only in the PL group (41 +/- 3 pg/ml). In PL women, F2-IsoPs were elevated postrace (p <.01), but returned to prerace concentrations by 2 h postrace. In PL men, F2-IsoP concentrations were higher postrace, 2 h postrace, and 1, 2, 3, 4, and 6 days postrace (PL vs. AO group, each p <.03). Markers of inflammation were increased dramatically in response to the run regardless of treatment group.

CONCLUSIONS: Thus, AO supplementation prevented endurance exercise-induced lipid peroxidation but had no effect on inflammatory markers.

PMID: 15110397