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Coenzyme Q10 supplementation reduces oxidative stress and increases antioxidant enzyme activity in patients with coronary artery disease.

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Abstract

OBJECTIVE: The purpose of this study was to investigate the effect of coenzyme Q10 supplementation on oxidative stress and antioxidant enzyme activity in patients with coronary artery disease (CAD).

METHODS: This was an intervention study. Patients who were identified by cardiac catheterization as having at least 50% stenosis of one major coronary artery or receiving percutaneous transluminal coronary angioplasty (n = 51) were randomly assigned to the placebo group (n = 14) or one of the two coenzyme Q10-supplemented groups (60 mg/d, n = 19 [Q10-60 group]; 150 mg/d, n = 18 [Q10-150 group]). Intervention was administered for 12 wk. Patients' blood samples were analyzed every 4 wk for plasma coenzyme Q10 concentrations, malondialdehyde (MDA), and antioxidant enzyme (catalase [CAT], superoxide dismutase [SOD], glutathione peroxidase) activity.

RESULTS: Forty-three subjects with CAD completed intervention study. Plasma coenzyme Q10 concentration increased significantly after coenzyme the Q10-150 intervention (P < 0.01). The MDA levels were significantly lower than baseline in the Q10-150 group at week 4 (P = 0.03). The Q10-150 group had significantly lower MDA levels than the placebo group at week 8 (P = 0.03). With respect to antioxidant enzyme activity, subjects in the Q10-150 group had significantly higher CAT (P = 0.03) and SOD (P = 0.03) activity than the placebo group at week 12. The plasma coenzyme Q10 concentration was significantly correlated with MDA levels (r = -0.35, P = 0.02) and CAT (r = 0.43, P = 0.01) and SOD activity (r = 0.39, P = 0.01). The ratio of plasma coenzyme Q10 to total cholesterol was significantly correlated with SOD activity (r = 0.39, P = 0.02). The ratio of plasma coenzyme Q10 to low-density lipoprotein was significantly correlated with CAT (r = 0.35, P = 0.04) and SOD (r = 0.45, P = 0.01) activity. However, there was no relation between coenzyme Q10 concentration and glutathione peroxidase activity.

CONCLUSION: Coenzyme Q10 supplements at a dose of 150 mg can decrease oxidative stress and increase antioxidant enzyme activity in patients with CAD. A higher dose of coenzyme Q10 supplements (>150 mg/d) might promote rapid and sustainable antioxidation in patients with CAD.

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