Abstract

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Diminution of oxidative stress through vitamins C and E supplementation associates with blood pressure reduction in essential hypertensives.

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BACKGROUND: Oxidative stress has been associated with mechanisms of essential hypertension. The present study tests the hypothesis that the antioxidant properties of vitamins C and E are associated with a diminution of blood pressure in essential hypertensives.

METHODS AND DESIGN: A randomized, double-blind, placebo-controlled clinical trial was conducted in 110 essential hypertensive (grade 1) men (age 35 to 60 years) without obesity, dyslipidemia, diabetes mellitus, smoking, vigorous physical exercise, without use of any medications and/or high consumption of fruits and vegetables. Participants were randomly assigned to receive either double-blind vitamin E (400 UI/day) and C (1000 mg/day) or placebo for eight weeks. Twenty-four hours ambulatory blood pressure, blood analysis of oxidative stress related parameters in the erythrocytes (reduced/oxidized glutathione ratio, antioxidant enzymes, malondialdehyde) and plasma FRAP, ferric reducing ability of plasma, 8-isoprostane, vitamins C and E levels were measured at baseline and after treatment.

RESULTS: Following antioxidant vitamin administration, essential hypertensives showed significantly lower systolic, diastolic and mean arterial blood pressure levels and higher erythrocyte and serum antioxidant capacity compared with either placebo or non-treated hypertensives. Blood pressures correlated positively with plasma 8-isoprostane levels and negatively with plasma FRAP levels in both treated groups.

CONCLUSIONS: The present study supports the view that oxidative stress is involved in the pathogenesis of essential hypertension. The enhancement of antioxidant status by vitamins C and E supplementation in essential hypertensive patients is associated with lower blood pressure. This suggests intervention with antioxidants as an adjunct therapy for hypertension.

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