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The effect of the phytoestrogen genistein on plasma nitric oxide concentrations, endothelin-1 levels and endothelium dependent vasodilation in postmenopausal women

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Abstract

The phytoestrogen genistein improves endothelial dysfunction in ovariectomized rats through a nitric oxide-dependent mechanism. We investigated whether genistein alters the balance between the nitric oxide products and endothelin-1 and influences endothelium-dependent vasodilation in postmenopausal women. Sixty healthy postmenopausal women were enrolled in the study. A double-blind, placebo controlled, randomized design was employed. After a 4-week stabilization on a standard fat-reduced diet, participants to the study were randomly assigned to receive either genistein (n 30; 54 mg/day) or placebo (n 30). Flow-mediated, endothelium-dependent vasodilation of the brachial artery, plasma nitric oxide breakdown products and endothelin-1 levels were measured at baseline and after 6 months of genistein therapy. The mean baseline level of nitrites/nitrates was 22910 mmol/l and increased to 41910 mmol/ml after 6 months of treatment. The mean baseline plasma endothelin-1 level was 1494 pg/ml and decreased to 791 pg/ml following 6 months of treatment with genistein. The mean baseline ratio of nitric oxide to endothelin also significantly increased at the end of treatment. Flow-mediated, endothelium-dependent vasodilation of the brachial artery was 3.990.8 mm at baseline and increased to 4.490.7 mm after 6 months of treatment. Placebo-treated women showed no changes in plasma nitrites/nitrates, endothelin-1 levels and flow-mediated vasodilation. Genistein therapy improves flow-mediated endothelium dependent vasodilation in healthy postmenopausal women. This improvement may be mediated by a
direct effect of genistein on the vascular function and could be the result of an increased ratio of nitric oxide to endothelin.