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The effect of flax seed cultivars with differing content of alpha-linolenic acid and lignans on responses to mental stress.

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Abstract

BACKGROUND:

Phytoestrogens offer a possible alternative to hormone replacement therapy. Flax seed contains large quantities of a phytoestrogen precursor, secoisolariciresinol diglucoside (SDG), as well as large quantities of alpha-linolenic acid; these factors may be protective against vascular disease. We have previously shown that the rise in blood pressure during mental stress is a strong predictor of atherosclerosis progression.

METHODS:

35 postmenopausal women with vascular disease, 62 +/- 8 years of age, were treated in a random-sequence double-blind Latin square crossover study comparing three strains of flax seed: Flanders (low in lignan and high in alpha-linolenic acid), Linola 989 (high in lignan and low in alpha-linolenic acid) and AC Linora (intermediate in both lignan and alpha-linolenic acid).

RESULTS:

Compared to the pre-treatment baseline diet, all three strains of flax significantly reduced blood pressure during mental stress induced by a frustrating cognitive task (Stroop color-word interference task) ($p = 0.004$). Linola 989, the strain highest in lignan and lowest in alpha-linolenic acid, was associated with the least increase in peripheral resistance during stress, the greatest reduction in plasma cortisol during stress and the smallest increase in plasma fibrinogen during mental stress.

CONCLUSION:

Flax phytoestrogens ameliorate certain responses to stress and thus may afford protection against atherosclerosis; this hypothesis should be tested in clinical trials.