Efficacy of plant sterols is not influenced by dietary cholesterol intake in hypercholesterolemic individuals.

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Abstract

Plant sterols (PSs) reduce plasma total and low-density lipoprotein cholesterol (LDL-C) levels by reducing cholesterol absorption; however, it is not known whether the level of dietary cholesterol intake has an impact on the efficacy of PSs on blood lipids. The purpose of this study was to determine the effect of high vs low dietary cholesterol levels on the lipid-lowering efficacy of free PSs. The study was a semirandomized, double-blind, crossover trial consisting of four 28-day feeding phases each separated by a 4-week washout period. Otherwise healthy hypercholesterolemic subjects (n = 22) consumed each of (a) low-cholesterol control (C(-)S(-)), (b) high-cholesterol control (C(+)S(-)), (c) 22 mg PSs per kilogram of body weight with a low-cholesterol diet (C(-)S(+)), and (d) 22 mg PSs per kilogram of body weight with a high-cholesterol diet (C(+)S(+)). Blood was drawn on the first and last 2 days of each phase to measure plasma total cholesterol, LDL-C, high-density lipoprotein cholesterol, and triacylglycerols as well as plasma campesterol and beta-sitosterol concentrations. Dietary cholesterol had no effect on PS efficacy as a cholesterol-lowering agent because no interaction was found between the 2 factors. However, dietary cholesterol and PS intake had significant independent effects on plasma total cholesterol, LDL-C, and high-density lipoprotein cholesterol levels. Beta-sitosterol levels in plasma increased (P < .0001) as a result of PS supplementation. Data from the present study indicate that, although PSs and dietary cholesterol exert independent effects on plasma cholesterol, PS efficacy is not affected by varying levels of cholesterol intake.