Abstract

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Intake of phenol-rich virgin olive oil improves the postprandial prothrombotic profile in hypercholesterolemic patients.

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BACKGROUND: Oxidative stress associated with postprandial lipemia contributes to endothelial dysfunction, which shifts hemostasis to a more thrombogenic state.

OBJECTIVE: We investigated whether a high concentration of phenols in olive oil can partly reverse this phenomenon.

DESIGN: Twenty-one hypercholesterolemic volunteers received 2 breakfasts rich in olive oils with different phenolic contents (80 or 400 ppm) according to a randomized, sequential crossover design. Plasma concentrations of lipid fractions, factor VII antigen (FVIIag), activated factor VII (FVIIa), and plasminogen activator inhibitor-1 (PAI-1) activity were measured at baseline and postprandially.

RESULTS: Concentrations of FVIIa increased less (P = 0.018) and plasma PAI-1 activity decreased more (P = 0.021) 2 h after the high-phenol meal than after the low-phenol meal. FVIIa concentrations 120 min after intake of the olive oil with a high phenol content correlated positively with fasting plasma triacylglycerols (P = 0.001), area under the curve (AUC) of triacylglycerols (P = 0.001), and AUC of nonesterified fatty acids (P = 0.024) and negatively with hydroxytyrosol plasma concentrations at 60 min (P = 0.039) and fasting HDL-cholesterol concentrations (P = 0.005). PAI-1 positively correlated with homeostasis model assessment of insulin resistance (P = 0.005) and fasting triacylglycerols (P = 0.025) and inversely with adiponectin (P = 0.026). In a multivariate analysis, the AUCs of nonesterified fatty acids (R(2) = 0.467; beta: 0.787; SE: 0.02; P < 0.001) and adiponectin (R(2) = 0.232; beta: -1.594; SE: 0.629; P < 0.05) were the strongest predictors of plasma FVIIa and PAI-1, respectively.

CONCLUSIONS: A virgin olive oil with a high content of phenolic compounds changes the postprandial hemostatic profile to a less thrombogenic state.

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