

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 thrombotic 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 (FVIIg), 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 thrombotic state.

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