

Abstract

J Nutr. 2004 Oct;134(10):2517-22.

The effect of dietary fat on LDL size is influenced by apolipoprotein E genotype in healthy subjects.

Moreno JA, Pérez-Jiménez F, Marín C, Gómez P, Pérez-Martínez P, Moreno R, Bellido C, Fuentes F, López-Miranda J.

Lipids and Atherosclerosis Research Unit, Hospital Universitario Reina Sofía, Córdoba, Spain.

OBJECTIVE: LDL particle size is dependent on both genetic factors and environmental factors such as dietary fat composition. The apolipoprotein E (apoE) genotype is a major genetic determinant of LDL size. Thus, the aim of this work was to study whether the apoE genotype interacts with the quantity and quality of dietary fat, modifying LDL size in young healthy subjects.

METHODS: Healthy subjects (n = 84; 66 apoE 3/3, 8 apoE 4/3, 10 apoE 3/2) were subjected to 3 dietary periods, each lasting 4 wk. The first was an SFA-enriched diet (38% fat, 20% SFA), which was followed by a carbohydrate (CHO)-rich diet (30% fat, < 10% SFA, 55% carbohydrate) or a monounsaturated fatty acid (MUFA) olive oil-rich diet (38% fat, 22% MUFA) following a randomized crossover design. At the end of each diet period, LDL particle size and plasma levels of total cholesterol, LDL cholesterol (LDL-C), HDL-C, apoB, apoA-I, and triacylglycerols were determined.

RESULTS: LDL particle size was significantly higher ($P < 0.04$) in subjects with the apoE 4/3 genotype compared with those with apoE 3/3 and apoE 3/2 in the basal state. LDL size was smaller ($P < 0.02$) after the CHO diet than after the MUFA or SFA diets. After the CHO diet, a significant increase in LDL particle size ($P < 0.035$) was noted with respect to the MUFA diet in apoE 4/3 subjects, whereas a significant decrease was observed in the apoE 3/3 individuals ($P < 0.043$).

CONCLUSION: In conclusion, a Mediterranean diet, high in MUFA-fat increases LDL particle size compared with a CHO diet, and this effect is dependent of apoE genotypes.

PMID: 15465740

FREE FULL TEXT