

LOW-DENSITY LIPOPROTEIN MARKERS OF FATTY ACID INTAKE

S Muñoz, A Asensio, D Zambón*, E Ros*, B Campero*, A Pérez-Heras*, Jsabaté[#], M Merlos, JC Laguna. Dep. Farmacología, Fac Farmacia, Univ Barcelona, *Clinica de Lipidos, Hospital Clinic i Provincial, Barcelona, Spain, [#]Dept Nutrition, Loma Linda Univ, CA, USA.

Health benefits appear to be associated with consuming plants rich in alfa-linolenic acid (LNA), an essential fatty acid (EFA). Biological markers of EFA intake are useful in epidemiological and clinical research. Therefore, we analyzed FA in LDL lipids as markers of EFA consumption in patients consuming diets with different EFA content.

Patients & Methods: In a randomized cross-over study, 28 patients with primary hypercholesterolemia (22 F/6M, age range 34-68 yrs) received isocaloric diets differing in EFA composition: a MUFA diet, olive oil-rich (MO), and a FUFA diet, containing about 50 g walnuts (PW). Respective fat composition values (percent of daily energy) were: total fat 30 vs 33, SFA 5 vs 5, MUFA 21 vs 16, and PUFA 4 vs 12. The main changes in the PW diet with respect to the MO diet were a 21% decrease in the intake of oleic acid (18:1), a 150% increase in linolenic acid (18:2n-6), and a 300% increase in LNA (18:3n-3). After 6 wks on each diet, blood was obtained for isolating LDL and measuring fatty acid content of lipid species: phospholipids (PL), triglycerides (TG), and cholesteryl esters (CE).

Results: The fatty acid molar percent of LDL lipid species reflected different intakes in PW vs MO diets, with a 13-17% MUFA reduction in PL, TG, and CE, and PUFA increases of 21% in TG and 7% in CE. Furthermore, these changes were also reflected in increases of both linolenic acid (PL 13%, TG 35%, CE 15%) and LNA (PL 114%, TG 200%, CE 73%).

Conclusions: The 18:1, 18:2n-6, and 18:3n-3 molar percent of the LDL-TG fraction appear to be most sensitive for assessment of ongoing fatty acid intake in dietary intervention trials.

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