HUMAN LDL OXIDATION AFTER A PUFA-ENRICHED DIET FROM A VEGETABLE SOURCE

S Muñoz, A Asensio, D Zambón*, E Ros*, J Sabaté[#], 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 PUFA. Nevertheless, concern exists about the possible reduction of the oxidation resistance of LDL with such diets. Therefore, we analyzed composition and oxidation related analytes of LDL from patients consuming diets with different PUFA content.

Patients & Methods: In a randomized, cross-over study, 28 patients with primary hypercholesterolemia received two isocaloric diets: a MUFA diet, olive oil-rich (MO), and a PUFA 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. After 6-week of dietary intervention LDLs were isolated and their lipid composition was analyzed. Further, the LDL-susceptibility to copper induced oxidation was studied as conjugated-dienes (CD kinetics, TBARS, oxidation of lysine residues (Lys), plasma vitamin C(VC) and LDL-vitamin E (VE).

Results: The PW diet modified LDL FA molar compostion by inceasing PUFA, mainly in cholesteryl esters CE (7%) and triglycerides TG (21%),a nd decreasing MUFA (12-17%) in phospholipids, TG, and CE. No changes of VC, VE, TBARS, and Lys were observed. CD kinetics showed unmodified lag time values (MO 42±7 vs TW 41±6min), but a slight increase in the maximum rate of CD formation (MO 27±4 vs MW 34±5 nmol/min/mg LDL-prot) and in the maximum amount of CD formed (MO 736±55 vs PW 808±63 nmol/mg LDL-prot).

Conclusions: Although a PUFA rich diet induces an LDL enrichment with PUFA, the resistance of LDL to an oxidative challenge is preserved, with no modification of the CD lag time value.

Financial support was partly provided by grants from FISss 94/0077 and the Walnut Commission of California.