

# Abstract

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## Changes in lipoprotein(a), oxidized phospholipids and LDL subclasses with a low-fat, high-carbohydrate diet.

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**BACKGROUND:** Low-fat diets have been shown to increase plasma concentrations of lipoprotein(a) [Lp(a)], a preferential lipoprotein carrier of oxidized phospholipids (OxPL) in plasma, as well as small, dense LDL particles.

**OBJECTIVE:** We sought to determine whether increases in plasma Lp(a) induced by a low-fat, high-carbohydrate (LFHC) diet are related to changes in OxPL and LDL subclasses.

**METHODS:** We studied 63 healthy subjects after 4 weeks of consuming, in random order, a high-fat, low-carbohydrate (HFLC) diet and a LFHC diet.

**RESULTS:** Plasma concentrations of Lp(a) ( $P < 0.01$ ), OxPL/apoB ( $P < 0.005$ ) and OxPL-apo(a) ( $P < 0.05$ ) were significantly higher on the LFHC diet compared to the HFLC diet, whereas LDL peak particle size was significantly smaller ( $P < 0.0001$ ). Diet-induced changes in Lp(a) were strongly correlated with changes in OxPL/apoB ( $P < 0.0001$ ). The increases in plasma Lp(a) levels after the LFHC diet were also correlated with decreases in medium LDL particles ( $P < 0.01$ ) and increases in very small LDL particles ( $P < 0.05$ ).

**CONCLUSIONS:** These results demonstrate that induction of increased levels of Lp(a) by a LFHC diet is associated with increases in oxidized phospholipids and with changes in LDL subclass distribution that may reflect altered metabolism of Lp(a) particles.

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