

Abstract

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Effects of a low-calorie diet associated with weight loss on lipoprotein-associated phospholipase A2 (Lp-PLA2) activity in healthy obese women.

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INTRODUCTION: Platelet-activating factor acetylhydrolase (PAF-AH or Lp-PLA(2)) is a Ca(2+)-independent phospholipase A(2) primarily associated in plasma with low density lipoproteins (LDL), especially with small dense LDL (sdLDL) particles. Increased plasma Lp-PLA(2) levels have been associated with increased cardiovascular risk in large clinical trials.

AIM: To assess the effects of weight loss on Lp-PLA(2) activity and to examine the association of Lp-PLA(2) activity changes with the alterations of sdLDL, the primary carrier of Lp-PLA(2) in plasma.

METHODS: Twenty-eight obese, non-diabetic women participated in a weight reduction program. Anthropometric parameters were assessed and parameters of glucose metabolism, lipid profile, Lp-PLA(2) activity, and LDL phenotype (using a 3% polyacrylamide gel-tube electrophoresis method), were determined at baseline and after 4 months of weight loss.

RESULTS: A 10% diet-induced weight loss resulted in significant improvement in most parameters of lipid and glucose metabolism. Moreover, Lp-PLA(2) activity was significantly reduced (-10.2%, $p < 0.01$). Mean LDL particle diameter did not change after the weight loss program. The cholesterol levels of very low-density lipoprotein (VLDL) and large-buoyant LDL particles were significantly reduced, but neither the cholesterol levels of sdLDL particles nor the % proportion of the sdLDL-cholesterol over the total LDL-cholesterol were changed after the intervention program. Interestingly, the changes in Lp-PLA(2) activity were correlated with the changes of VLDL-cholesterol ($r = 0.39$, $p < 0.05$), but not with the changes of anthropometric or other lipid variables.

CONCLUSIONS: A low-calorie diet associated with weight loss in obese women resulted in the significant reduction of the plasma levels of Lp-PLA(2), the potentially new predictor for incident atherosclerotic disease.