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Plasma HDL Cholesterol and Menopause

Maria Luz Fernandez
University of Connecticut
USA

COLUMN ARTICLE

Menopause or the cessation of menses for at least one year is characterized by increases in body fat, blood pressure, plasma glucose, coagulation factors and inflammatory markers, conditions that result in increased risk for chronic diseases including diabetes and cardiovascular complications. The increases in body weight, mainly visceral fat, are associated with increased risk for heart disease. One of the most prominent risk factors is the development of a more atherogenic lipoprotein profile characterized by higher concentrations of total and LDL cholesterol, elevations in plasma triglycerides and a shift towards the small dense LDL, particles that have a major contribution to the development of atherosclerosis [1]. Thus, these changes in plasma lipids and lipoproteins have been well documented in postmenopausal women. However, there is controversy regarding shifts in plasma HDL cholesterol after menopause [1,2].

The protective role of HDL in decreasing cardiovascular risk has been shown to have multiple targets. Not only HDL is associated with reverse cholesterol transport but it also exhibits anti-inflammatory, anti-oxidant anti-thrombotic and vasodilatory properties [3]. Thus it is clear that a decrease in this lipoprotein after menopause would further exacerbate the risk for heart disease. For a while it was believed that one of the risk factors for heart disease after menopause was the lowering of HDL cholesterol and HDL particles. In support of this concept, studies have shown low HDL in postmenopausal women [4]. In contrast, other authors have demonstrated that HDL cholesterol remains unchanged or possibly increases after menopause [2] even in conditions of metabolic syndrome [5].

Figure 1 depicts the risk factors associated with menopause and how HDL cholesterol is only decreased if there are substantial increases in body fat.

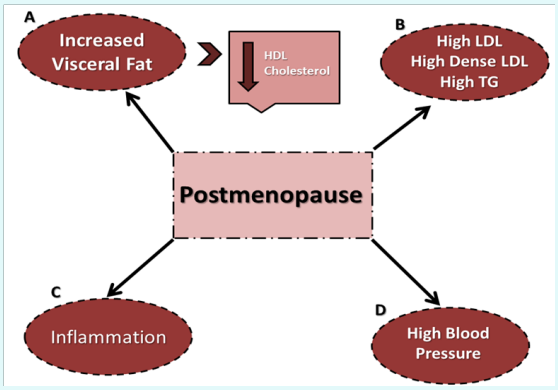

Figure 1: Postmenopause may cause increases in
A. visceral fat.
B. LDL, Dense LDL particles and TG.
C. Inflammatory markers.
D. High Blood Pressure. It is postulated that the decreases in HDL only occur with substantial increases in visceral fat.

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The major reason for these discrepancies could be attributed to visceral fat. We have recently shown that plasma HDL cholesterol concentrations are negatively associated with body mass index and waist circumference [5], a well-established marker of visceral fat. It could be that the low HDL cholesterol concentrations observed in postmenopausal women is due to the increases in visceral fat and the transition from a gynecoid to an android pattern of fat deposition and not to menopause *per se*. Based on the protective effects of HDL against heart disease risk and on the direct relationship of visceral fat with low HDL, the recommendation for postmenopausal women would be to maintain a healthy body weight and follow dietary prescriptions associated with less accumulation of body fat. If waist circumference does not substantially change after menopause, it is fair to assume that HDL cholesterol will not be decreased after menopause.

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