

Abstract

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Association Between Plasma LDL Particle Size, Valvular Accumulation of Oxidized LDL, and Inflammation in Patients With Aortic Stenosis.

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OBJECTIVE: In patients with severe aortic stenosis (AS), we examine the association between: (1) the content of oxidized LDL (oxLDL) in the aortic valve and the degree of inflammation and remodeling; (2) The proportion of small dense LDL particles in the plasma and the presence of oxLDL in the valve along with hemodynamic progression of valve stenosis.

METHODS AND RESULTS: We have examined 102 explanted AS valves. Tissue remodeling, inflammation, and accumulation of oxLDL were determined. A complete plasma lipid profile including the measurement of the relative proportion of small low-density lipoprotein (%LDL<255A) was obtained. Valves with higher oxLDL content had a significantly higher density of inflammatory cells, expression of tumor necrosis factor (TNF)-alpha, and increased tissue remodeling score. The %LDL<255A was significantly associated with oxLDL score within the aortic valve. In a subset of 59 patients in whom stenosis progression was measured, the %LDL<255A correlated with the annualized peak gradient ($r=0.29$; $P=0.04$).

CONCLUSIONS: Increased proportion of circulating small dense LDL particles is associated with faster progression rate of stenosis and greater accumulation of oxLDL in the aortic valve. These findings suggest that therapeutic interventions aimed at lowering the production of small dense LDL particles in patients with AS might represent a potentially interesting therapeutic avenue.

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