Abstract: **P5305**

Oxidized high-density lipoprotein is associated with progression of coronary artery calcification

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Introduction: As a residual cardiovascular risk, high-density lipoprotein (HDL) is of great interest in lipid management. Native HDL has an anti-atherogenic role, while oxidized HDL (oxHDL) has atherogenic property because of reduced anti-inflammatory properties compared with native HDL. Meanwhile, recent studies showed that rapid progression of coronary artery calcification (CAC), a marker of subclinical atherosclerosis, was associated with greater incidence of cardiovascular events. However, the role of oxHDL in the pathogenesis of CAC remains unclear.

Purpose: The purpose of this study was to examine the association between the annual change in oxHDL and the progression of CAC (Agatston score) in a substudy of prospective multicenter randomized study.

Methods: In the principal study, patients with a CAC score of 1 to 999 were treated with pitavastatin with/without eicosapentaenoic acid. Measurement of CAC with MDCT and a blood test were performed at baseline and at the 1-year follow-up. The principal study showed 30-40% of annual change in CAC in all patients and no difference in the progression of CAC among treatment groups. In this substudy (n=140), patients were divided into 2 groups: CAC progression (change in Agatston score of >0, n=103) and no CAC progression (n=37). The serum concentration of oxHDL was measured using an antibody against oxidized human apoA-I with ELISA. The difference in oxHDL between patients with hypercholesterolemia and healthy subjects (n=30) was also evaluated.

Results: OxHDL levels were significantly lower in healthy subjects than in patients with hypercholesterolemia (150 [107-176] and 167 [132-246], respectively; median [25th-75th percentile], U/ml) (p=0.006). The baseline log-transformed oxHDL level was correlated with total cholesterol (r=0.21, p=0.01), HDL-cholesterol (r=0.33, p<0.01), and triglycerides (r=-0.21, p=0.01), but not correlated with age, body mass index, hemoglobinA1c, LDL-cholesterol, serum creatinine, or high-sensitivity C-reactive protein. After treatment, the oxHDL level significantly decreased from 167 (132–246) at baseline to 122 (103–149) (median [25th–75th percentile], U/ml) (p<0.001). The annual change in CAC was significantly positively associated with changes in oxHDL (r=0.17, p=0.04), triglycerides (r=0.17, p=0.04), and hsCRP (r=0.22, p=0.01) but not associated with changes in LDL-C or HDL-C. Multiple logistic analysis demonstrated that the decrease in oxHDL per 10 U/ml was independently associated with CAC progression after adjusting for variables including baseline oxHDL, LDL-cholesterol, Agatston score and current smoking (odds ratio, 0.95; 95% confidence interval, 0.90–0.99; p=0.04).

Conclusion: The decrease in oxHDL is associated with the attenuation of CAC progression, suggesting that oxHDL is a potential target for preventing atherosclerosis.
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