Abstract

Background: Oxidized high-density lipoprotein (oxHDL), unlike native HDL, is characterized by reduced cholesterol efflux capability and anti-inflammatory properties. The ratio of oxHDL to apolipoprotein A-I (oxHDL/apoAI) is a possible marker of dysfunctional HDL. The aim of this study was to evaluate the association between oxHDL/apoAI and coronary plaque characteristics that increase the likelihood of cardiovascular events as determined by coronary computed tomography (CT) angiography.

Methods: A total of 297 patients (mean age; 67 years, men; 63 %) who underwent coronary CT angiography for suspected stable coronary artery disease (CAD) were included. High-risk plaques (HRP) were defined by three characteristics: positive remodeling; low-density plaques; and spotty calcification. Significant stenosis was defined as a luminal narrowing of > 70%. Serum concentrations of oxHDL were measured using an enzyme-linked immunosorbent assay.

Results: Patients with higher oxHDL/ApoAI showed significantly greater prevalence of HRP ($p = 0.03$) and significant stenosis ($p < 0.01$) compared with patients with low oxHDL/ ApoAI. The multivariate logistic analysis demonstrated that oxHDL/ApoAI significantly associated with the presence of HRP and significant coronary stenosis ($p = 0.01$ and < 0.01). In the follow-up study including 243 patients for a median period of 1.8 years, univariate cox regression analysis showed that oxHDL/ApoAI, HRP and significant stenosis were significant predictors of cardiovascular events.

Conclusions: A high oxHDL/apoAI was associated with the presence of HRP and significant stenosis determined by coronary CT angiography, which can lead to cardiovascular events in patients with suspected stable CAD.