

Lower levels of low-density lipoprotein cholesterol are associated with lower prevalence of thin-cap fibroatheroma in statin-treated patients with coronary artery disease

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Background: Lowering low-density lipoprotein cholesterol (LDL-C) with statins slows progression of atherosclerotic plaques and reduces cardiovascular events. The 2019 European Society of Cardiology guideline for the management of dyslipidaemias recommends the absolute LDL-C treatment target as <55mg/dL for very high-risk patients, <70 mg/dL for high-risk patients and <100 mg/dL for moderate-risk patients. However, the difference in plaque composition of coronary lesions according to these LDL-C levels remains to be elucidated.

Purpose: To investigate plaque morphologies according to LDL-C levels in statin-treated patients with coronary artery disease (CAD).

Methods: A total of 685 consecutive statin-treated patients with CAD, who underwent optical coherence tomography (OCT) imaging of culprit lesions were enrolled. The prevalence of vulnerable compositions in culprit plaques evaluated by OCT was compared among the groups of patients classified by LDL-C levels (<55, 55–70, 70–100, ≥100 mg/dL).

Results: LDL-C levels <55 mg/dL, <70 mg/dL and <100 mg/dL were observed in 6.3%, 21.8% and 63.9% of patients, respectively. The prevalence of thin-cap fibroatheroma was significantly different among the groups ($P=0.014$, Figure) with a trend toward lower prevalence in the lower two LDL-C groups than in the higher two LDL-C groups. A gradient with lower prevalence of thrombus in lower LDL-C groups was observed, although the statistical significance was not demonstrated (Figure). There was no significant difference in the prevalence of macrophage or cholesterol crystal among the groups.

Conclusions: Lower LDL-C level was associated with a trend toward lower prevalence of thin-cap fibroatheroma and thrombus in statin-treated patients with CAD.

Figure. Plaque morphologies of culprit lesion observed using OCT

