Relation of Coronary Artery Plaque Assessed by Cardiac CT and Serum Level of CRP

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Background: The role of inflammation in atherosclerosis is well established, but data emphasizing the correlation of coronary plaque components to serum levels of high-sensitivity C-reactive protein (hs-CRP) are lacking. Since multidetector computed tomography (MDCT) permits the detection and characterization of coronary plaques, we sought to investigate the relation between hs-CRP and coronary artery remodelling, plaque volume, and composition in patients with acute chest pain (ACP).

Methods: Retrospective ECG-gated MDCT (Brilliance 64, Philips Medical Systems, Cleveland, Ohio) was performed in 329 patients with ACP. Serum level of hs-CRP was determined in all patients and atherosclerotic plaques were analyzed for the presence of calcified, intermediate, and soft components. Using a dedicated software coronary artery remodelling as well as the total plaque volumes and the volumes of calcified, intermediate, and soft plaques were calculated.

Results: Three hundred twenty nine patients were included in the study, 217 of them were free of coronary artery disease (CAD), 29 had significant (≥ 50% luminal diameter stenosis) coronary artery stenosis and 78 had non-significant coronary artery stenosis. Five patients were excluded from the analysis because of insufficient image quality. Plasma hs-CRP was significantly higher in patients with significant coronary artery stenosis compared to patients with non-significant coronary artery stenosis and patients free of CAD (3.4 ± 3.6, 2.9 ± 2.5, and 2.0 ± 1.8 respectively; $P = 0.004$). The level of hs-CRP correlated significantly with coronary artery remodelling ($r2 = 0.72$, $P < 0.001$), but not with the total plaque volume ($r2 = 0.11$, $P = 0.2$), or with calcified ($r2 = 0.04$, $P = 0.69$), intermediate ($r2 = 0.18$, $P = 0.06$), and soft plaque ($r2 = 0.01$; $P = 0.9$) components.

Conclusions: High sensitivity CRP appears to correlate with coronary artery remodelling but not with plaque volumes or plaque components in patients with ACP.