



Editorial

Identifying the patient subset with highest inflammation levels in acute coronary syndromes

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C-reactive protein (CRP) elevation in acute coronary syndromes (ACS) has been considered a marker of poorer outcome for many years [1]. The underlying mechanism that triggers the elevation of CRP in the ACS setting is a matter of debate [2]. Some studies highlight vascular inflammation linked to the acute complication of atherosclerotic plaques in the coronary artery wall, while other studies underscore the inflammation in the myocardium secondary to the processes of acute ischemia and infarction. Both mechanisms (vascular and myocardial inflammation) certainly play a role, but the fact that acute phase reactant elevation is higher in acute myocardial infarction than in unstable angina suggests that myocardial necrosis might be the main source of inflammation [3]. Furthermore, the finding that CRP predicts long-term mortality (endpoint related with infarct size) but not myocardial infarction (theoretically dependent on plaque inflammation and vulnerability) reinforces the relationship between CRP levels and myocardial necrosis extension [2]. However, if CRP elevation were a mere marker of infarct size, its predictive value would disappear after adjusting for necrosis biomarkers [4]. That this does not happen implies that vascular inflammation is also involved.

Optical coherence tomography (OCT) provides excellent visualization of the intracoronary lumen. This is a unique technique to evaluate the degree of plaque complication in ACS. The presence of ruptured plaques at the culprit lesion as opposed to intact fibrous cap plaques predicts worse prognosis at mid-term follow-up [5,6]. Likewise, Niccoli

et al. reported that patients with plaque rupture had higher CRP levels than patients with plaque erosion or without evidence of thrombus [7]. In a further study, the same group of authors found that among patients with plaque rupture, highest CRP elevation was observed in those with macrophage infiltration, indicative of high local inflammation [8]. Taken together these OCT data confirm that inflammation at the coronary culprit lesion increases CRP in ACS, although its relative contribution compared to inflammation at the myocardial necrotic area still needs to be clarified.

The present study of Fracassi et al. analysed CRP levels and OCT findings in 156 patients with ACS [9], assessing their predictive value for recurrent ACS at 3 years. In multivariable analysis, both high CRP levels and OCT findings suggestive of vascular inflammation (plaque rupture, macrophage inflammation and multifocal atherosclerosis) were independent predictors of recurrent ACS. According to the magnitude of the odds ratio and to subgroup analysis, OCT high-risk features seem to be the most powerful predictor. Indeed, 37% of patients with high CRP but not OCT high-risk features had a good outcome. This result could be explained by the lack of specificity of CRP as biomarker of inflammation and the inter-individual variability in degree of inflammatory response. The results of the study confirm the previously demonstrated prognostic value of OCT findings in ACS [5,6]. The main novelty is the potential additive prognostic value provided by CRP levels. In this sense, although CRP was statistically significant, the clinical relevance is probably marginal.

Some limitations of the study should be considered: 1) Apparently, the predictive analysis was not adjusted for any parameter of infarct size or left ventricular function. Therefore, the OCT data or CRP levels could be a surrogate of a larger myocardial infarction. 2) A 2 mg/L cut-off was selected to define CRP elevation. Though the greater the CRP levels, the worse the prognosis, other studies found 10 mg/L cut-off as the best discriminator [1]. 3) The time points of CRP measurements and OCT are not reported; it would be useful to know whether or not they were simultaneous. Furthermore, CRP elevation exhibits a time course from admission to the first 24–48 h [2]. Conceivably, CRP levels at admission are more closely related with inflammation in the coronary tree whereas later CRP levels are influenced by inflammation at the myocardial area of necrosis. On the other hand, CRP levels are a better prognostic predictor at discharge than at admission.

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In summary, this study provides further information on the role of inflammation in the pathogenesis and prognosis of ACS. One of the most important findings was a subgroup of patients with OCT high-risk features and also high CRP who all developed recurrent ACS during follow-up. Further studies are warranted to elucidate if tailored anti-inflammatory therapy would be beneficial in these particular patients.

Conflict of interest

The authors report no relationships that could be construed as a conflict of interest.

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