116. Elevated Resolvin D1 Predicts Plaque Rupture in Patients With Acute Myocardial Infarction: An Optical Coherence Tomography Study

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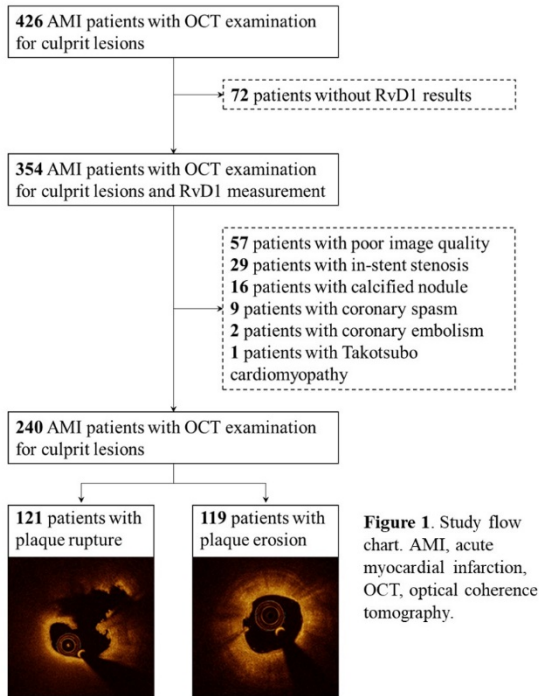
Body

Background: Resolvin D1 (RvD1) has been demonstrated to inhibit atherosclerosis in animal models. However, its concentration in human plasma and impacts on coronary atherosclerotic plaques remains unclear. This study aimed to investigate the associations between RvD1 levels and plaque types in patients with acute myocardia infarction (AMI).

Methods: A total of 240 AMI patients undergoing optical coherence tomography (OCT) examination was analyzed. Patients were stratified by the median of RvD1 measured from the blood samples collected at admission. Univariable logistic regression was used to identify independent predictors of plaque rupture (PR), followed by multiple adjustment. The area under the curve (AUC), net reclassification index (NRI) and integrated discrimination improvement (IDI) was calculated to assess the additional predictive value of RvD1 of PR.

Results: Among the included patients, 121 (50.4 %) patients presented with PR. Patients with higher RvD1 ($\geq$ 129.7 pg/mL) showed higher prevalence of PR (57.5 % vs 41.7 %, P = 0.014) and thinner fibrous cap (90 [60-120] μm vs 100 [70-140] μm, P = 0.022) as compared to those with lower RvD1 (< 129.7 pg/mL). Higher RvD1 was independent predictor of PR (odds ratio: 1.76, 95% confidence interval: 1.02-3.02, P = 0.041) after adjustment for other significant risk factors (P < 0.1) identified in univariable analysis (i.e., age, diabetes, platelet, culprit lesion at right coronary artery). The addition of RvD1 to models of clinical risk factors increased the accuracy for prediction of PR (NRI: 0.32, P = 0.014; IDI = 0.02, P = 0.032).

Conclusion: Elevated RvD1 is associated with PR and thinner fibrous cap, and could be a potential biomarker for prediction of PR.

426 AMI patients with OCT examination for culprit lesions

→ 72 patients without RvD1 results

354 AMI patients with OCT examination for culprit lesions and RvD1 measurement

→ 57 patients with poor image quality
29 patients with in-stent stenosis
16 patients with calcified nodule
9 patients with coronary spasm
2 patients with coronary embolism
1 patients with Takotsubo cardiomyopathy

240 AMI patients with OCT examination for culprit lesions

121 patients with plaque rupture

119 patients with plaque erosion

Figure 1. Study flow chart. AMI, acute myocardial infarction, OCT, optical coherence tomography.

Factors	Univariable analysis OR (95% CI)	P-value	Multivariable analysis OR (95% CI)	P-value
RvD1 ($\geq$129.7pg/ml)	1.89 (1.13-3.16)	0.015	1.76 (1.02-3.02)	0.041
Age, years	1.02 (1.01-1.05)	0.012	1.02 (1.00-1.05)	0.068
Diabetes	1.84 (1.06-3.21)	0.030	1.90 (1.06-3.43)	0.032
Platelet, $\times 10^9$/L	0.99 (0.98-0.99)	0.002	0.99 (0.99-1.00)	0.024
Culprit lesion at RCA	1.98 (1.15-3.41)	0.014	1.94 (1.13-3.36)	0.017

Table 1 (↑). Logistic regression for predictors of plaque rupture. RvD1, resolving D1; RCA, right coronary artery.

Figure 2 (→). Receiver operating curve for resolvin D1 (RvD1) and clinical risk factors to predict plaque rupture. NRI, net reclassification index; IDI, integrated discrimination improvement.

Risk factors + RvD1 0.70 (0.64-0.77)
Risk factors 0.68 (0.62-0.75)
NRI 0.32 (0.06-0.57)   IDI 0.02 (0.01-0.03)
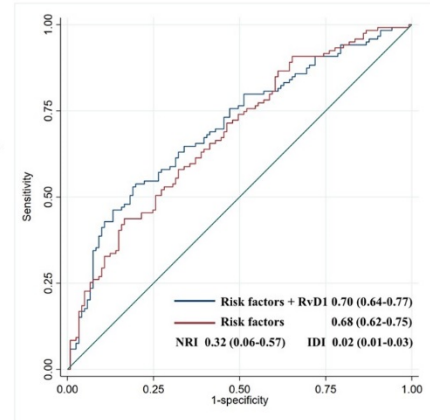
Clinical Implications: better understand the role of anti-inflammatory agent RvD1 in the parthenogenesis of atherosclerosis, and was the first to report RvD1 relevant data in AMI patients.