## 1 Abstract

2	Aims: Acute myocardial infarction (AMI) is associated with left ventricular remodelling (LVR),
3	which leads to progressive heart failure. Platelets play a pivotal role in promoting systemic and
4	cardiac inflammatory responses during the complex process of myocardial wound healing or
5	repair following AMI. This study aimed to investigate the impact of platelet reactivity
6	immediately after primary percutaneous coronary intervention (PCI) on LVR in AMI patients
7	with ST-segment (STEMI) and non-ST-segment elevation (NSTEMI).
8	Methods: This prospective, single-centre, observational study included 182 patients with AMI
9	who underwent primary PCI (107 patient with STEMI and 75 patients with NSTEMI). Patients
10	were administered a loading dose of aspirin plus prasugrel before the procedure, and platelet
11	reactivity was assessed using the VerifyNow P2Y12 assay immediately after PCI.
12	Echocardiography was performed before discharge and during the chronic phase (8 $\pm$ 3 months
13	after discharge). LVR was defined as a relative $\geq 20\%$ increase in left ventricular end-diastolic
14	volume index (LVEDVI).
15	Results: LVR in chronic phase was found in 34 patients (18.7%) whose platelet reactivity was
16	significantly higher than those without LVR (259.6 $\pm$ 61.5 and 213.1 $\pm$ 74.8 P2Y12 reaction units
17	[PRU]; $p = 0.001$ ). The occurrence of LVR did not differ between patients with STEMI and
18	patients with NSTEMI (21.5% and 14.7%; p=0.33). The optimal cut-off value of platelet
19	reactivity for discriminating LVR was $\geq$ 245 PRU. LVEDVI significantly decreased at chronic
20	phase in patients without high platelet reactivity (<245 PRU) (from 49.2 $\pm$ 13.5 to 45.4 $\pm$ 15.8
21	ml/m <sup>2</sup> ; p = 0.02), but not in patients with high platelet reactivity ( $\geq$ 245 PRU) (p=0.06).
22	Multivariate logistic analysis showed that high platelet reactivity was an independent predictor of
23	LVR after adjusting for LVEDVI before discharge (odds ratio, 4.13; 95% confidence interval,
24	1.85–9.79).

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Conclusions: High platelet reactivity measured immediately after PCI was a predictor of LVR in
patients with AMI during the chronic phase. The role of antiplatelet therapy on inflammation in
the myocardium is a promising area for further research.

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- 5 **Keywords**: myocardial infarction, left ventricular remodelling, platelet reactivity, inflammation,
- 6 reverse remodelling, prasugrel