

INTISARI

Latar Belakang: Inflamasi sistemik dan aktivasi trombosit berperan penting dalam patofisiologi *acute heart failure* (AHF) dan berkontribusi terhadap luaran klinis yang buruk. *Mean platelet volume* (MPV) merupakan indikator ukuran dan reaktivitas trombosit yang mudah diperoleh dari pemeriksaan darah rutin serta berpotensi mencerminkan status protrombotik. Bukti mengenai peran MPV sebagai prediktor *major adverse cardiac events* (MACE) pada AHF masih terbatas.

Tujuan: Menganalisis peran MPV $\geq 10,5$ fL sebagai prediktor MACE 90 hari pada pasien AHF.

Metode: Studi kohort retrospektif dilakukan pada 192 pasien AHF non-sindrom koroner akut usia >18 tahun di RSUP Dr. Sardjito Yogyakarta. Pasien dengan sepsis, penyakit hematologi/ autoimun/ keganasan aktif, trombositosis $>500.000/\mu\text{L}$, atau trombositopenia $<100.000/\mu\text{L}$ dieksklusi. Data klinis dan laboratoris diperoleh saat admisi. *Mean platelet volume* diklasifikasikan menjadi $\geq 10,5$ fL dan $<10,5$ fL. Luarannya adalah MACE 90 hari (kematian kardiovaskular, infark miokard, revaskularisasi, stroke, atau rehospitalisasi kardiovaskular). Analisis menggunakan uji *Chi-square* dan regresi *modified Poisson* dengan *robust variance* untuk menghitung *relative risk* (RR).

Hasil: *Major adverse cardiac events* terjadi pada 56,3% pasien. Proporsi MACE lebih tinggi pada kelompok MPV $\geq 10,5$ fL dibanding $<10,5$ fL (65% vs 46,7%; $p=0,011$). *Mean platelet volume* $\geq 10,5$ fL meningkatkan risiko MACE sebesar 39,1% (RR=1,391; 95%CI: 1,071–1,805; $p=0,013$) dan tetap signifikan setelah penyesuaian (*adjusted* RR=1,379; 95%CI: 1,071–1,805; $p=0,014$). Anemia (*adjusted* RR=1,383; $p=0,010$) juga merupakan prediktor independen MACE.

Kesimpulan: *Mean platelet volume* $\geq 10,5$ fL saat admisi merupakan prediktor independen MACE 90 hari pada pasien AHF. Sebagai parameter yang sederhana dan mudah didapat, MPV berpotensi menjadi alat stratifikasi risiko awal AHF dalam praktik klinis.

Kata kunci: *acute heart failure*; *mean platelet volume*; *major adverse cardiac events*; biomarker prognostik.

ABSTRACT

Background: Systemic inflammation and platelet activation play important roles in the pathophysiology of acute heart failure (AHF) and contribute to adverse clinical outcomes. Mean platelet volume (MPV), a readily available marker of platelet size and reactivity derived from routine blood tests, may reflect a prothrombotic state. However, evidence regarding the association between MPV and major adverse cardiac events (MACE) in AHF remains limited.

Objective: To analyze the role of admission MPV ≥ 10.5 fL as a predictor of 90-day MACE in patients with AHF.

Methods: This retrospective cohort study included 192 adult patients with AHF without acute coronary syndrome treated at Dr. Sardjito General Hospital, Yogyakarta. Patients with sepsis, active hematologic/autoimmune/malignant disease, thrombocytosis ($>500,000/\mu\text{L}$), or severe thrombocytopenia ($<100,000/\mu\text{L}$) were excluded. Clinical and laboratory data were obtained at admission. *Mean platelet volume* was categorized into ≥ 10.5 fL and <10.5 fL groups. The primary outcome was 90-day MACE, defined as cardiovascular death, myocardial infarction, revascularization, stroke, or cardiovascular rehospitalization. Associations were analyzed using Chi-square tests and modified Poisson regression with robust variance to estimate relative risk (RR).

Results: *Major adverse cardiac events* occurred in 56.3% of patients. The incidence was significantly higher in the MPV ≥ 10.5 fL group compared to <10.5 fL (65% vs. 46.7%; $p=0.011$). *Mean platelet volume* ≥ 10.5 fL increased the risk of MACE by 39.1% (RR=1.391; 95%CI: 1.071–1.805; $p=0.013$) and remained significant after adjustment (adjusted RR=1.379; 95%CI: 1.071–1.805; $p=0.014$). Anemia (adjusted RR=1.383; $p=0.010$) were also independent predictors of MACE.

Conclusion: Admission MPV ≥ 10.5 fL is an independent predictor of 90-day MACE in patients with AHF. MPV may serve as a simple and accessible tool for early risk stratification of AHF in clinical practice.

Keywords: acute heart failure; mean platelet volume; major adverse cardiac events; prognostic biomarker.