

INTISARI

Latar belakang: Inflamasi sistemik berperan penting dalam patogenesis dan progresivitas *acute heart failure* (AHF) serta berkontribusi terhadap tingginya angka mortalitas. *Neutrophil-to-albumin ratio* (NAR) merupakan biomarker inflamasi yang mudah diperoleh dan berpotensi mencerminkan derajat inflamasi akut dan kronis. Literatur yang membahas peran prognostik NAR terhadap kematian pada pasien AHF masih terbatas.

Tujuan: Mengevaluasi peran NAR sebagai prediktor kematian 90 hari pada pasien AHF di RSUP dr. Sardjito.

Metode: Penelitian ini merupakan studi kohort retrospektif yang melibatkan 209 pasien AHF yang dirawat di RSUP dr. Sardjito, Yogyakarta. Data klinis dan laboratoris diperoleh dari rekam medis elektronik saat admisi. Nilai NAR dihitung dari jumlah neutrofil absolut ($10^9/L$) dibagi kadar albumin serum (g/L) dan dikategorisasi berdasarkan kuartil. Luaran penelitian adalah kematian dalam 90 hari. Hubungan antara NAR dan kematian dianalisis menggunakan uji *chi-square*, analisis *survival Kaplan–Meier* dengan *log-rank test*, serta regresi *Cox proportional hazards* (SPSS versi 25; signifikansi ditetapkan pada $p < 0,05$).

Hasil: Pasien pada kuartil NAR tertinggi (lebih dari 0,255) memiliki proporsi kematian yang lebih tinggi dibandingkan kuartil NAR sedang tinggi, sedang rendah, dan rendah (42,3% vs 26,9% vs 26,4% vs 15,4%; $p = 0,023$). Analisis *Kaplan–Meier* menunjukkan ketahanan hidup yang secara signifikan lebih pendek pada kelompok kuartil NAR tertinggi dibandingkan kuartil lainnya (rerata 61,2 vs 77,0 vs 75,8 vs 82,5 hari; *log-rank* $p = 0,009$). Regresi *Cox* multivariat menunjukkan bahwa kuartil NAR tertinggi berhubungan secara independen dengan peningkatan risiko kematian dibandingkan kuartil terendah (*adjusted HR* = 3,479; 95%CI: 1,541-7,855 $p = 0,003$). Kovariat lain termasuk hipertensi, *coronary artery disease* dan anemia tidak menunjukkan hubungan bermakna ($p > 0,05$).

Kesimpulan: NAR tinggi lebih dari 0,255 merupakan prediktor independen kematian 90 hari pada pasien AHF. Sebagai parameter sederhana dan mudah diakses, NAR berpotensi digunakan untuk stratifikasi risiko awal pasien AHF dalam praktik klinis.

Kata kunci: *acute heart failure; neutrophil-to-albumin ratio; kematian; biomarker prognostik*

ABSTRACT

Background: Systemic inflammation plays an important role in the pathogenesis and progression of acute heart failure (AHF) and contributes to its high mortality rate. The neutrophil-to-albumin ratio (NAR) is an easily obtainable inflammatory biomarker that may reflect both acute and chronic inflammatory status. Studies evaluating the prognostic significance of NAR for mortality in AHF patients are still limited.

Objective: To evaluate the prognostic value of NAR for 90-day mortality in patients with AHF at dr. Sardjito General Hospital

Methods: This retrospective cohort study included 209 patients with AHF treated in dr. Sardjito General Hospital, Yogyakarta. Clinical and laboratory data were obtained from electronic medical records at admission. NAR was calculated as the absolute neutrophil count ($10^9/L$) divided by serum albumin level (g/L) and categorized into quartiles. The primary outcome was mortality within 90 days. The association between NAR and mortality was analyzed using the chi-square test, Kaplan–Meier survival analysis with the log-rank test, and Cox proportional hazards regression (*SPSS* version 25; significance set at $p < 0,05$).

Results: Patients in the highest NAR quartile (greater than 0,255) had a significantly higher mortality rate compared with those in the upper-middle, lower-middle, and lowest quartiles (42,3% vs 26,9% vs 26,4% vs 15,4%; $p = 0,023$). Kaplan–Meier analysis demonstrated significantly shorter survival in the highest NAR quartile compared with other quartiles (mean survival time: 61,2 vs 77,0 vs 75,8 vs 82,5 days; log-rank $p = 0,009$). Multivariate Cox regression analysis revealed that the highest NAR quartile was independently associated with an increased risk of mortality compared with the lowest quartile (*adjusted HR* = 3,479; 95%CI: 1,541-7,855 $p = 0,003$). Other covariates including hypertension, coronary artery disease and anemia were not significantly associated with mortality ($p > 0,05$).

Conclusion: A high NAR greater than 0,255 is an independent predictor of 90-day mortality in patients with AHF. As a simple and readily available parameter, NAR may serve as a useful tool for early risk stratification of AHF in clinical practice.

Keywords: acute heart failure; neutrophil-to-albumin ratio; mortality; prognostic biomarker