

INTISARI

***PLATELET-TO-LYMPHOCYTE RATIO* SEBAGAI INDIKATOR SEVERITAS PASIEN COVID-19 RUMAH SAKIT DR. SARDJITO**

Latar belakang: SARS-CoV-2 telah menyebabkan sejumlah besar infeksi secara global dalam waktu yang singkat, hingga WHO menyatakan status pandemi ketika kasus melebihi 118 ribu dengan lebih dari 4.000 kematian. Dalam kondisi keterbatasan fasilitas kesehatan dan jumlah kasus infeksi COVID-19 yang besar, identifikasi *severitas* serta penanganan yang cepat dan tepat menjadi hal yang penting. Berbagai penelitian telah melaporkan abnormalitas jumlah sel imun dan peningkatan penanda inflamasi sering terlihat pada pasien COVID-19 parah. PLR merupakan salah satu penanda inflamasi yang sudah digunakan untuk beberapa penyakit. Akan tetapi, tidak banyak studi yang meneliti hubungan PLR dengan tingkat keparahan dan mortalitas COVID-19, terutama dengan populasi Indonesia.

Tujuan: Untuk mengetahui adanya hubungan antara index inflamasi PLR (*Platelet-to-Lymphocyte Ratio*) dengan *severitas* pada kelompok pasien COVID-19 tanpa gejala/ringan/sedang dan kelompok pasien COVID-19 berat/kritis/meninggal di RSUP Dr. Sardjito.

Metode: Penelitian retrospektif yang menggunakan data klinis dan data laboratoris dari rekam medis RSUP DR Sardjito. Sampel penelitian adalah semua pasien terkonfirmasi COVID-19 yang berusia di atas 18 tahun dan dirawat inap pada Maret 2020-Maret 2022 berjumlah total 304 subjek. Subjek dibagi menjadi dua kelompok berdasarkan *cut-off* PLR yang didapatkan dengan analisis ROC menjadi PLR rendah dan tinggi.

Hasil: Nilai *cut-off* PLR didapat pada 171,9 ((Sensitivitas 71,2%; Spesivitas 46,5%; *Likelihood ratio* 1,331; AUC 0,592; $p = 0,006$). Tidak ada perbedaan karakteristik antara kelompok subjek dengan PLR tinggi ($\geq 171,9$) dan kelompok subjek dengan PLR rendah, kecuali diabetes melitus ($p = 0,025$) dan *severitas* ($p = 0,002$). Ditemukan bahwa penambahan usia meningkatkan risiko *severitas* parah (aOR = 1,031; $p = 0,001$; 95% CI = 1,013—1,050). Laki-laki berisiko memiliki *severitas* yang lebih buruk dibandingkan dengan perempuan (aOR = 2,324; $p = 0,001$; 95% CI = 1,403—3,849) sedangkan pasien dengan CHD pada penelitian ini menurunkan kecenderungan mengalami *severitas* yang parah (aOR = 0,063; $p = 0,017$; 95% CI = 0,006—0,608). Kemudian, hasil utama penelitian ini adalah PLR tinggi berhubungan bermakna dengan *severitas* berat/kritis/meninggal (aOR = 2,264; $p = 0,002$; 95% CI = 1,354—3,789). Uji *Spearman's correlation* menunjukkan bahwa terdapat korelasi bermakna positif namun lemah antara kedua variabel tersebut ($r = 0,181$; $p = 0,002$).

Kesimpulan: PLR tinggi berhubungan secara signifikan dengan *severitas* berat/kritis/meninggal pada COVID-19. Terdapat potensi PLR sebagai indikator *severitas* pada pasien COVID-19

Kata kunci: COVID-19, SARS-CoV-2, *Platelet-to-lymphocyte ratio*, PLR, *severitas*, penanda inflamasi

ABSTRACT

PLATELET-TO-LYMPHOCYTE RATIO AS AN INDICATOR OF SEVERITY IN COVID-19 PATIENTS AT DR. SARDJITO HOSPITAL

Background: SARS-CoV-2 has caused a significant number of infections globally in a short period, leading the WHO to declare a pandemic when cases exceeded 118,000 with more than 4,000 deaths. In conditions of limited healthcare facilities and a large number of COVID-19 infection cases, identifying severity and providing quick and appropriate treatment is crucial. Various studies have reported abnormalities in immune cell counts and increased inflammatory markers often seen in severe COVID-19 patients. PLR (Platelet-to-Lymphocyte Ratio) is one of the inflammatory markers already used for several diseases. However, not many studies have investigated the relationship between PLR and the severity and mortality of COVID-19, especially in the Indonesian population.

Purpose: To determine the relationship between the inflammatory index PLR (Platelet-to-Lymphocyte Ratio) and severity in groups of asymptomatic/mild/moderate COVID-19 patients and groups of severe/critical/deceased COVID-19 patients at RSUP Dr. Sardjito.

Methods: A retrospective study using clinical and laboratory data from the medical records of RSUP Dr. Sardjito. The study sample consisted of all confirmed COVID-19 patients over the age of 18 who were hospitalized between March 2020 and March 2022, totaling 304 subjects. Subjects were divided into two groups based on the PLR cut-off obtained through ROC analysis into low and high PLR.

Results: The PLR cut-off value was found to be 171.9 (sensitivity 71.2%; specificity 46.5%; likelihood ratio 1.331; AUC 0.592; $p = 0.006$). There was no difference in characteristics between the subjects with high PLR (≥ 171.9) and those with low PLR, except for diabetes mellitus ($p = 0.025$) and severity ($p = 0.002$). It was found that increasing age increased the risk of severe severity (aOR = 1.031; $p = 0.001$; 95% CI = 1.013—1.050). Male is at a higher risk of having worse severity compared to female (aOR = 2,324; $p = 0,001$; 95% CI = 1,403—3,849) while patients with CHD in this study reduced the likelihood of experiencing severe severity (aOR = 0,063; $p = 0,017$; 95% CI = 0,006—0,608). The main finding of this study is that high PLR is significantly associated with severe/critical/deceased severity in COVID-19 (aOR = 2,264; $p = 0,002$; 95% CI = 1,354—3,789). Spearman's correlation test showed a significant but weak positive correlation between the two variables ($r = 0.181$; $p = 0.002$).

Conclusion: High PLR is significantly associated with severe/critical/deceased severity in COVID-19. There is potential for PLR as a severity indicator in COVID-19 patients.

Keywords: COVID-19, SARS-CoV-2, Platelet-to-lymphocyte ratio, PLR, severity, inflammatory markers