

## ABSTRACT

### THE RELATIONSHIP BETWEEN NLPR (NEUTROPHIL-TO-LYMPHOCYTE PLATELET RATIO) AND MORTALITY IN SEVERE AND CRITICAL COVID-19 PATIENTS AT RSUP DR. SARDJITO PERIOD 1 MARCH–31 DECEMBER 2021

**BACKGROUND:** In severe cases, COVID-19 patients exhibit excessive systemic inflammation triggers dysregulation of specific pathways in the immune, hemostasis, and coagulation systems. Early identification of mortality risk is crucial for saving the lives of COVID-19 patients. Various inflammation biomarkers have been studied regarding their association with prognosis and mortality in COVID-19 patients, one of which is NLPR (neutrophil-to-lymphocyte platelet ratio). Several studies, such as those by Eissa *et al.* (2021) and Tahavvori *et al.*, have shown the potential of NLPR as a predictor of mortality in COVID-19 patients. However, research on the significance of NLPR in predicting prognosis and mortality in COVID-19 patients remains limited, necessitating further studies.

**OBJECTIVE:** Analyzing the relationship between NLPR (neutrophil-to-lymphocyte platelet ratio) and mortality in severe and critical COVID-19 patients at RSUP Dr. Sardjito period 1 March–31 December 2021.

**METHODS:** This study is using a retrospective cohort design. The target population consisted of severe and critical COVID-19 patients at RSUP Dr. Sardjito during the period from 1 March to 31 December 2021. Consecutive sampling was utilized as the sampling technique. Secondary data from medical records were used. Data analysis began with bivariate analysis between NLPR and mortality. Cut-off point of NLPR was determined by using ROC curve analysis. Chi-Square test was applied to assess the difference in mortality proportions according to NLPR. Multivariate analysis was additionally performed to control for potential confounders.

**RESULTS:** Patients with severe and critical COVID-19 with an NLPR  $\geq 3,767$  have a 1,401 times higher risk of death compared to those with an NLPR  $< 3,767$ .

**CONCLUSION:** There is an association between NLPR and mortality among patients with severe and critical COVID-19.

**KEYWORDS:** COVID-19 Patients, Severe, Critical, NLPR, Mortality

## INTISARI

### **HUBUNGAN ANTARA NLPR (*NEUTROPHIL-TO-LYMPHOCYTE PLATELET RATIO*) TERHADAP MORTALITAS PASIEN COVID-19 DERAJAT BERAT DAN KRITIS DI RSUP DR. SARDJITO PERIODE 1 MARET–31 DESEMBER 2021**

**LATAR BELAKANG:** Pada derajat yang parah, pasien COVID-19 mengalami inflamasi sistemik berlebih yang memicu disregulasi jalur spesifik dalam sistem imun, hemostasis, dan koagulasi. Identifikasi awal terhadap risiko mortalitas penting dalam penyelamatan nyawa pasien COVID-19. Berbagai *biomarker* inflamasi diteliti terkait hubungannya dengan prognosis dan mortalitas pasien COVID-19, salah satunya adalah NLPR (*neutrophil-to-lymphocyte platelet ratio*). Beberapa penelitian, seperti oleh Eissa *et al.* (2021) dan Tahavvori *et al.*, menunjukkan potensi NLPR sebagai prediktor mortalitas pasien COVID-19. Namun, penelitian yang menyebutkan signifikansi NLPR dalam memprediksi prognosis dan mortalitas pada pasien COVID-19 masih sangat terbatas sehingga perlu dilakukan penelitian lebih lanjut.

**TUJUAN:** Menganalisis hubungan antara NLPR (*neutrophil-to-lymphocyte platelet ratio*) dan mortalitas pada pasien COVID-19 derajat berat dan kritis di RSUP Dr. Sardjito periode 1 Maret–31 Desember 2021.

**METODE:** Penelitian ini menggunakan desain penelitian kohort retrospektif. Populasi penelitian ini adalah pasien covid derajat berat dan kritis di RSUP Dr. Sardjito periode 1 Maret–31 Desember 2021. Teknik pengambilan sampel adalah *consecutive sampling*. Data berupa data sekunder dari rekam medis. Metode analisis data diawali dengan analisis bivariat antara NLPR dan mortalitas. Titik potong NLPR menggunakan grafik ROC. Uji Chi-Square digunakan untuk menghitung beda proporsi mortalitas menurut NLPR. Analisis multivariat turut dilakukan untuk mengontrol variabel pengganggu potensial.

**HASIL:** Pasien COVID-19 derajat berat dan kritis dengan NLPR  $\geq 3,767$  memiliki risiko kematian 1,401 kali lebih besar dibandingkan dengan pasien dengan NLPR  $< 3,767$ .

**KESIMPULAN:** Terdapat hubungan antara NLPR dengan mortalitas pada pasien COVID-19 derajat berat dan kritis.

**KATA KUNCI:** Pasien COVID-19, Derajat Berat, Kritis, NLPR, Mortalitas