

INTISARI

HUBUNGAN AGGREGATE INDEX OF SYSTEMIC INFLAMMATION (AISI) TERHADAP MORTALITAS 14 HARI PADA PASIEN COVID-19 DERAJAT BERAT DAN KRITIS DI RSUP DR. SARDJITO

Latar Belakang: Pada akhir tahun 2019, kemunculan pandemi COVID-19 yang disebabkan virus SARS-CoV-2 menjadi masalah kesehatan global. Pada kasus COVID-19 yang parah, pasien dapat mengalami berbagai komplikasi yang mengakibatkan mortalitas. Mortalitas pada pasien COVID-19 tidak lepas dari timbulnya inflamasi sistemik. Banyaknya aktivitas sel imun tubuh dalam inflamasi sistemik tersebut menjadikan pengukuran sel-sel darah dan imun sebuah indeks gabungan yang menarik untuk diteliti. Salah satu indeks pengukuran yang dapat diteliti adalah *Aggregate Index of Systemic Inflammation* (AISI). Alat-alat ukur prediktif seperti AISI yang menghitung limfosit, neutrofil, platelet, dan monosit, dapat lebih bermanfaat dibandingkan indeks sederhana karena alat ini lebih menunjukkan status inflamasi dalam konteks kondisi penyakit tertentu (Zinellu *et al.*, 2021). Dengan begitu, peneliti ingin meneliti ada tidaknya hubungan antara inflamasi sistemik (yang diukur menggunakan AISI) dengan mortalitas 14 hari pada pasien COVID-19 rawat inap derajat berat dan kritis.

Tujuan: Mengetahui hubungan antara inflamasi sistemik (yang diukur menggunakan AISI) dengan mortalitas 14 hari pasien COVID-19 rawat inap derajat berat dan kritis di RSUP Dr. Sardjito.

Metode: Studi kohort retrospektif dilakukan pada 283 pasien COVID-19 derajat berat dan kritis di RSUP Dr. Sardjito bulan Mei – Oktober 2021. Analisis univariat dilakukan untuk menghitung distribusi dan frekuensi setiap variabel penelitian. Nilai *cut-off* skor AISI ditentukan dengan analisis kurva ROC melalui metode Euclidean. Analisis bivariat dilakukan dengan uji χ^2 untuk menghitung beda proporsi variabel pengganggu potensial menurut kelompok tertentu berdasarkan skor AISI dan berdasarkan mortalitas. Uji χ^2 juga digunakan untuk menghitung beda proporsi mortalitas 14 hari menurut kelompok tertentu berdasarkan skor AISI. Analisis multivariat digunakan untuk menghitung keeratan hubungan antara skor AISI dan variabel pengganggu potensial terhadap mortalitas 14 hari.

Hasil: Uji χ^2 menunjukkan bahwa skor AISI yang tinggi (di atas *cut-off* sebesar 1375,55) memiliki hubungan yang signifikan dengan mortalitas 14 hari pasien ($p=0,006$; RR=2,45; 95% CI: 1,32–4,56). Penyakit ginjal kronik menjadi variabel perancu karena berhubungan dengan mortalitas 14 hari pasien ($p=0,02$; RR=1,20; 95% CI: 1,10–1,33). Uji regresi logistik menunjukkan bahwa skor AISI tetap memiliki hubungan signifikan dengan mortalitas 14 hari pasien ($p=0,003$; OR=2,59; 95% CI: 1,38–4,85).

Kesimpulan: Terdapat hubungan antara inflamasi sistemik (yang diukur menggunakan AISI) dengan mortalitas 14 hari COVID-19 pada pasien COVID-19 rawat inap derajat berat dan kritis. Pasien dengan skor AISI di atas *cut-off* 2,45 kali lebih berisiko mengalami mortalitas 14 hari dibandingkan dengan pasien dengan skor AISI di bawah *cut-off*.

Kata Kunci: COVID-19 derajat berat dan kritis, AISI, Mortalitas, inflamasi sistemik

ABSTRACT

THE RELATIONSHIP BETWEEN AGGREGATE INDEX OF SYSTEMIC INFLAMMATION (AISI) AND 14-DAY MORTALITY OF SEVERE AND CRITICAL COVID-19 PATIENTS IN RSUP DR. SARDJITO

Background: In late 2019, the emergence of the COVID-19 pandemic caused by the SARS-CoV-2 virus became a global health concern. In cases of which COVID-19 worsens, patients may experience various complications such as pulmonary dysfunction and septic shock, which can lead to mortality. Mortality in COVID-19 patients is closely associated with the onset of systemic inflammation in the form of a cytokine storm. Given the intense activity of immune cells in this systemic inflammatory response, which contributes to mortality, the measurement of blood and immune cells as a composite index has become an important area of study. One such index is the Aggregate Index of Systemic Inflammation (AISI). Predictive tools such as AISI, which incorporate lymphocyte, neutrophil, platelet, and monocyte counts, may be more useful than simpler indices, as they reflect the inflammatory status in specific disease contexts better (Zinellu et al., 2021). Therefore, this study aims to investigate the association between systemic inflammation (measured by AISI) and 14-day mortality among in-patients with severe and critical COVID-19.

Objective: To determine the association between systemic inflammation (measured by AISI) and 14-day mortality in in-patients with severe and critical COVID-19 at Dr. Sardjito General Hospital.

Method: A retrospective cohort study was conducted involving 283 patients with severe and critical COVID-19 treated at Dr. Sardjito General Hospital from May to October 2021. Univariate analysis was performed to assess the distribution and frequency of each study variable. The AISI cut-off value was determined using ROC curve analysis with the Euclidean method. Bivariate analysis using the chi-square test was used to assess differences in proportions of potential confounding variables based on AISI score groups and mortality status. The chi-square test was also used to evaluate differences in 14-day mortality proportions across AISI score groups. Multivariate analysis was used to assess the association between the AISI score and potential confounding variables with 14-day mortality.

Results: Chi-square analysis showed that a high AISI score (above the cut-off value of 1375.55) was significantly associated with 14-day mortality ($p = 0.006$; $RR = 2.45$; 95% CI: 1.32–4.56). Chronic kidney disease was identified as a confounding variable due to its association with 14-day mortality ($p = 0.02$; $RR = 1.20$; 95% CI: 1.10–1.33). Logistic regression analysis showed that AISI score remained significantly associated with 14-day mortality ($p = 0.003$; $OR = 2.59$; 95% CI: 1.38–4.85).

Conclusion: There is a significant association between systemic inflammation (measured by AISI) and 14-day mortality in in-patients with severe and critical COVID-19. Patients with an AISI score above the cut-off have a 2.45 times higher risk of 14-day mortality compared to those with lower scores.

Keywords: Severe and critical COVID-19, AISI, Mortality, Systemic inflammation