

## ABSTRAK

**LATAR BELAKANG:** Sepsis adalah disfungsi organ mengancam jiwa akibat respons terhadap infeksi. *Calprotectin* serum dilepaskan oleh neutrofil dan makrofag, menandakan proses inflamasi, *Systemic Immune Inflammation Index* (SII) menggabungkan jumlah neutrofil, limfosit, dan trombosit memberikan gambaran komprehensif respons imun dan tingkat inflamasi sistemik. Kedua *biomarker* ini berperan penting dalam deteksi dini dan penilaian prognosis sepsis

**TUJUAN:** Menganalisis kadar *calprotectin* serum dan *Systemic Immune Inflammation Index* (SII) sebagai faktor risiko kejadian sepsis.

**METODE:** Penelitian observasional analitik dengan desain *cross-sectional* terhadap 80 pasien suspek sepsis ( $qSOFA \geq 2$ ) yang dirawat di ICU RSUP Dr Kariadi Semarang pada periode Januari-Maret 2024. Pengukuran kadar *calprotectin* dilakukan dengan metode ELISA, nilai SII dihitung secara manual dari hasil hema-analizer otomatis dengan menghitung jumlah neutrofil, limfosit, dan trombosit. Analisis statistik menggunakan rasio prevalensi dengan uji *chi-square* ( $p < 0,001$ ) dan regresi logistik ( $p < 0,05$ ).

**HASIL:** Pasien suspek sepsis dengan kadar *calprotectin*  $\geq 3,3$  mg/L memiliki rasio prevalensi risiko sepsis 3,15 kali lebih tinggi dibandingkan kadar *calprotectin*  $< 3,3$  mg/L ( $p < 0,001$ ) dan memiliki hubungan signifikan dengan peningkatan 4,4 kali risiko kejadian sepsis ( $p < 0,05$ ). Pasien suspek sepsis dengan nilai SII  $\geq 7563$  memiliki rasio prevalensi risiko sepsis 3,1 kali lebih tinggi dibandingkan nilai SII  $< 7563$ , namun hubungan ini tidak signifikan secara statistik ( $p > 0,05$ ), meskipun terjadi peningkatan 3 kali risiko kejadian sepsis.

**SIMPULAN:** Kadar *calprotectin* serum dan SII berfungsi sebagai *biomarker* untuk mendeteksi risiko sepsis pada pasien ICU.

Kata Kunci: Sepsis, *Calprotectin*, *Systemic Immune Inflammation Index* (SII)

## ABSTRACT

**BACKGROUND:** Sepsis is a life-threatening organ dysfunction caused by infection. Serum calprotectin, released by neutrophils and macrophages, indicates an inflammatory process. The Systemic Immune Inflammation Index (SII) combines neutrophil, lymphocyte, and platelet counts to provide a comprehensive picture of immune response and systemic inflammation. These biomarkers are crucial for early detection and sepsis prognosis assessment.

**OBJECTIVE:** To analyze serum calprotectin levels and Systemic Immune Inflammation Index (SII) as risk factors for sepsis.

**METHODS:** This analytical observational study with a cross-sectional design included 80 suspected sepsis patients ( $qSOFA \geq 2$ ) admitted to the ICU of Dr. Kariadi Hospital, Semarang, from January to March 2024. Calprotectin levels were measured using ELISA, and SII values were calculated manually from hematology analyzer results by counting neutrophils, lymphocytes, and platelets. Statistical analysis used prevalence ratio with the chi-square test ( $p < 0.001$ ) and logistic regression ( $p < 0.05$ ).

**RESULTS:** Patients suspected of sepsis with calprotectin levels  $\geq 3.3$  mg/L have a prevalence ratio of sepsis risk 3.15 times higher compared to calprotectin levels  $< 3.3$  mg/L ( $p < 0.001$ ) and have a significant association with a 4.4 times increased risk of sepsis events ( $p < 0.05$ ). Patients suspected of sepsis with an SII value  $\geq 7563$  have a prevalence ratio of sepsis risk 3.1 times higher compared to an SII value  $< 7563$ , but this relationship is not statistically significant ( $p > 0.05$ ), although there is a 3 times increased risk of sepsis events.

**CONCLUSION:** Serum calprotectin and SII levels serve as biomarkers for detecting the risk of sepsis in ICU patients.

**Keywords:** Sepsis, Calprotectin, Systemic Immune Inflammation Index (SII)