

## INTISARI

**Latar belakang:** *Coronavirus Disease 2019* atau COVID-19 adalah penyakit menular yang disebabkan oleh SARS-CoV2. Beberapa penelitian yang menunjukkan bahwa pada pasien COVID-19 dengan gejala berat dapat mengalami respon imun yang terganggu, hal ini dapat menyebabkan perkembangan kondisi hiperinflamasi. Peningkatan NLR mencerminkan ketidakseimbangan respon inflamasi. Terdapat indikator inflamasi yang lain yaitu adalah *C-reactive protein* (CRP). Peningkatan kadar CRP merupakan penanda inflamasi yang sudah lazim dipakai. *C-Reactive protein* merupakan golongan protein yang diproduksi dalam hepatosit saat terjadi inflamasi dengan sensitivitas yang baik. Biaya pemeriksaan CRP masih relatif lebih tinggi dan ketersediaan di pelayanan kesehatan primer belum ada. Sampai saat ini belum ada penelitian korelasi NLR dan CRP pada pasien COVID-19 khususnya yang dirawat di RSUP Dr. Sardjito, Yogyakarta.

**Tujuan:** Penelitian ini bertujuan untuk mengevaluasi bagaimana korelasi NLR dengan kadar CRP pada pasien COVID-19 yang dirawat inap RSUP Dr. Sardjito.

**Metode:** Penelitian dilakukan dengan desain observasional analitik menggunakan data sekunder pada pasien COVID-19 yang dirawat di RSUP Dr. Sardjito. Data diambil berdasarkan hasil PCR di laboratorium biomolekular di Instalasi Laboratorium Terpadu, kemudian subjek penelitian dipilih berdasarkan kriteria inklusi yaitu pasien rawat inap  $\geq 18$  tahun yang menjalani perawatan dengan protokol COVID-19 di RSUP Dr. Sardjito dan memiliki hasil pemeriksaan NLR dan CRP dalam 24 jam saat terdiagnosis Covid-19. Analisis data dasar secara deskriptif, ditampilkan dalam median (minimal–maksimal). Data kategorikal disajikan dalam proporsi. Data yang dianalisis secara statistik adalah pemeriksaan NLR dan CRP dengan uji korelasi *Spearman* nilai  $p < 0,5$  dianggap signifikan secara statistik. Data dianalisis menggunakan software SPSS versi 27.

**Hasil:** Didapatkan 277 subjek penelitian, terdiri dari pasien COVID-19 dengan usia 57 (18-90) tahun, 56% pria dan 44% wanita. Didapatkan median NLR 6,24 (0,78 – 81,1) dan kadar CRP 77 (4-151) mg/L. Pada penelitian ini didapatkan koefisien korelasi antara NLR dan kadar CRP sebesar  $r=0,487$ ;  $p<0,001$ .

**Kata kunci:** COVID-19, hiperinflamasi, *neutrophil to lymphocyte ratio* (NLR), CRP (*C-reactive protein*)

## ABSTRACT

**Background:** *Coronavirus Disease 2019* or COVID-19 is an infectious disease caused by the new strain of coronavirus (SARS-CoV2). Few studies indicate that COVID-19 patients with severe symptoms have an impaired immune response that is caused by exacerbation of hyperinflammation response, while NLR elevation reflect the imbalance of inflammation response. Another indicator of inflammation is C-reactive protein (CRP). Elevated CRP levels are a commonly used marker of inflammation. C-Reactive protein is a class of proteins produced in hepatocytes during inflammation with good sensitivity. The cost of CRP examination is still relatively high and the availability of primary health services is not yet available. Until now, there has been no study about correlation between NLR and CRP in COVID-19 patients those treated at Dr. RSUP. Sardjito, Yogyakarta.

**Objective:** The aim of this study is to evaluate how the correlation between NLR and CRP levels in COVID-19 patients who are hospitalized at RSUP Dr. Sardjito.

**Methods:** The study was conducted with an analytical observational design using secondary data on COVID-19 patients who were treated at RSUP Dr. Sardjito. Data was taken based on PCR results in the biomolecular laboratory at the Integrated Laboratory Installation, then the research subjects were selected based on inclusion criteria, namely inpatients 18 years who underwent treatment with the COVID-19 protocol at Dr. Sardjito and has the results of NLR and CRP examinations within 24 hours of being diagnosed with COVID-19. Descriptive basic data analysis, displayed in the median (minimum– maximum). Categorical data are presented in proportions. The data analyzed statistically were NLR and CRP examination with Spearman correlation test p value  $<0.05$  was considered statistically significant. Data were analyzed using SPSS version 27 software.

**Result:** There were 277 research subjects, consisting of COVID-19 patients aged 57 (18-90) years, 56% men and 44% women. The median NLR was 6,24 (0,78 – 81,1) and CRP levels were 77 (4-151) mg/L. In this study, the correlation coefficient between NLR and CRP levels was  $r=0.487$ ;  $p<0.001$

**Keywords:** COVID-19, hyperinflammation, neutrophil to lymphocyte ratio (NLR), C-reactive protein (CRP)