

## ABSTRAK

### PERBEDAAN C-REACTIVE PROTEIN (CRP), MEAN PLATELET VOLUME (MPV), DAN RASIO CRP/MPV PADA PASIEN COVID-19 DENGAN ATAU TANPA INFEKSI SEKUNDER BAKTERI

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**Latar Belakang:** Infeksi sekunder merupakan infeksi yang muncul bersamaan dengan infeksi yang telah terjadi sebelumnya. Infeksi sekunder bisa terjadi pada pasien COVID-19, salah satu yang sering terjadi adalah infeksi sekunder oleh bakteri. C-Reactive Protein (CRP) dan Mean Platelet Volume (MPV) merupakan penanda peradangan yang terjadi pada tubuh. Saat tubuh dalam kondisi terinfeksi virus atau bakteri, akan terjadi peningkatan kadar CRP dan MPV. Namun demikian, hingga saat ini belum diketahui bagaimana perbedaan CRP, MPV, dan rasio CRP/MPV pada pasien COVID-19 dengan dan tanpa infeksi sekunder bakteri.

**Tujuan:** Menganalisis perbedaan CRP, MPV, dan rasio CRP/MPV pada pasien COVID-19 dengan atau tanpa infeksi sekunder bakteri.

**Metode:** Studi observasional analitik dengan desain potong lintang (*cross sectional*) retrospektif pada pasien COVID-19 derajat sedang, berat, dan kritis yang dirawat inap di RSUP Dr. Sardjito dari bulan Oktober 2020 hingga Maret 2021. Data sekunder dari rekam medis digunakan untuk mengkaji hubungan antara CRP, MPV, dan rasio CRP/MPV terhadap kejadian infeksi sekunder bakteri pada pasien COVID-19. Penelitian ini dianalisis secara statistik dengan analisis univariat dan bivariat menggunakan SPSS.

**Hasil:** Berdasarkan nilai median (minimal – maksimal) ditemukan bahwa terdapat perbedaan kadar CRP dan rasio CRP/MPV antara kelompok tanpa dan dengan infeksi sekunder bakteri, yaitu kadar CRP dan rasio CRP/MPV pada kelompok dengan infeksi sekunder bakteri lebih tinggi daripada kelompok tanpa infeksi sekunder bakteri (median kadar CRP 48.0 vs 91.0,  $p=0.048$  dan median rasio CRP/MPV 4.63 vs 8.27,  $p=0.040$ ). Kadar CRP  $\geq 84.5$  mg/L dapat meningkatkan resiko sebesar 3.516x terhadap kejadian infeksi sekunder bakteri. Rasio CRP/MPV  $\geq 6.25$  meningkatkan resiko kejadian infeksi sekunder bakteri sebanyak 3.6x.

**Kesimpulan:** Terdapat perbedaan signifikan kadar CRP dan rasio CRP/MPV pada pasien COVID-19 tanpa dan dengan infeksi sekunder bakteri.

**Kata kunci:** C-Reactive Protein, CRP, Mean Platelet Volume, MPV, rasio CRP/MPV, COVID-19, infeksi sekunder bakteri

## ABSTRACT

### DIFFERENCE BETWEEN C-REACTIVE PROTEIN (CRP), MEAN PLATELET VOLUME (MPV), AND CRP/MPV RATIO IN COVID-19 PATIENT WITH OR WITHOUT SECONDARY BACTERIAL INFECTION

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**Background:** Secondary infection is an infection that appears at the same time as infection that have occurred previously. Secondary infection can occur in COVID-19 patients, one that often occurs is secondary infection by bacteria. C-Reactive Protein (CRP) and Mean Platelet Volume (MPV) are markers of inflammation that occur in the body. When the body is infected with viruses or bacteria, there will be an increase in CRP and MPV levels. However, until now it is still not known the differences of CRP, MPV, and CRP/MPV ratio in COVID-19 patients with and without secondary bacterial infections.

**Objectives:** Analyze the differences of CRP, MPV, and CRP/MPV ratio in COVID-19 patients with or without secondary bacterial infections.

**Methods:** Analytical observational study with a retrospective cross sectional design in moderate, severe, and critical ill COVID-19 patients hospitalized at RSUP Dr. Sardjito from October 2020 to March 2021. Secondary data from medical records was used to examine the relationship between CRP, MPV, and CRP/MPV ratio on the incidence of secondary bacterial infections in COVID-19 patients. This research was analyzed statistically with univariate and bivariate analysis using SPSS.

**Results:** Based on the median value (minimum - maximum), it was found that there were differences in CRP levels and CRP/MPV ratio between groups without and with secondary bacterial infections, namely that the CRP levels and CRP/MPV ratio in the group with secondary bacterial infections were higher than those in the group without secondary bacterial infections (median CRP level 48.0 vs 91.0,  $p=0.048$  and median CRP/MPV ratio 4.63 vs 8.27,  $p=0.040$ ). CRP levels  $\geq 84.5$  mg/L can increase the risk by 3.516x of secondary bacterial infections. A CRP/MPV ratio  $\geq 6.25$  increases the risk of secondary bacterial infection by 3.6x.

**Conclusion:** There are significant differences in CRP levels and CRP/MPV ratio in COVID-19 patients without and with secondary bacterial infections.

**Keywords:** *C-Reactive Protein, CRP, Mean Platelet Volume, MPV, CRP/MPV ratio, COVID-19, secondary bacterial infection*