

## ABSTRAK

**Latar Belakang:** Sejak Desember 2019, *Coronavirus Disease* (COVID-19) yang disebabkan oleh SARS-CoV-2 telah menyebar dengan cepat di seluruh dunia, menyebabkan beban klinis tinggi dan variasi lama rawat inap antar pasien, terutama pada kasus derajat berat dan kritis. Respon fisiologis tubuh terhadap infeksi virus melibatkan aktivasi sel limfosit oleh sistem imun, yang salah satunya dapat dipengaruhi oleh hormon insulin. Kadar insulin dalam darah umumnya bergantung pada tingkat glukosa darah. Sampai saat ini, belum ada penelitian yang menganalisis rasio glukosa terhadap limfosit (*Glucose-to-Lymphocyte ratio/GLR*) sebagai prediktor lama rawat inap pada pasien COVID-19. Sehingga, pemahaman mengenai aspek ini perlu dikaji lebih lanjut.

**Tujuan:** Menganalisis *glucose-to-lymphocyte ratio* sebagai prediktor lama rawat inap pada pasien COVID-19 derajat berat dan kritis di RSUP Dr. Sardjito.

**Metode:** Penelitian ini merupakan studi analitik observasional dengan desain kohort retrospektif menggunakan data rekam medis pasien COVID-19 derajat berat dan kritis yang dirawat di RSUP Dr. Sardjito periode Februari-September 2021. Sebanyak 166 pasien memenuhi kriteria inklusi dan eksklusi.

**Hasil:** Nilai cut-off GLR yang ditetapkan berdasarkan analisis kurva ROC adalah 287,73. Hasil analisis multivariat menunjukkan bahwa  $GLR \geq 287,73$  berhubungan signifikan dengan peningkatan lama rawat inap  $\geq 9$  hari (OR= 2,579; p= 0,008; 95% CI: 1,281-5,192). Selain itu, infeksi saluran kemih juga menunjukkan hubungan signifikan dengan peningkatan lama rawat inap (OR= 16,221; p= 0,01; 95% CI: 1,936-135,891). Sementara itu, *chronic kidney disease* (CKD) tampak bersifat protektif terhadap lama rawat inap  $\geq 9$  hari (OR= 0,302; p= 0,025; 95% CI: 0,106-0,858), temuan ini kemungkinan dipengaruhi oleh kategorisasi lama rawat inap. Variabel seperti usia, jenis kelamin, dan jumlah limfosit tidak menunjukkan hubungan signifikan dalam memengaruhi lama rawat inap.

**Kesimpulan:** *Glucose-to-lymphocyte ratio* (GLR) dapat digunakan sebagai prediktor lama rawat inap pada pasien COVID-19 derajat berat dan kritis di RSUP Dr. Sardjito (p= 0,008).

**Kata kunci:** COVID-19, pasien derajat berat dan kritis, *glucose-to-lymphocyte ratio*, lama rawat inap, prediktor

## ABSTRACT

**Background:** Since December 2019, Coronavirus Disease 2019 (COVID-19), caused by SARS-CoV-2, has rapidly spread worldwide, leading to a substantial clinical burden and variations in the length of hospital stay, particularly among patients with severe and critical disease. The physiological response to viral infection involves lymphocyte activation by the immune system, a process that may be influenced by insulin levels. Blood insulin concentration generally depends on glucose levels. To date, no studies have examined the Glucose-to-Lymphocyte Ratio (GLR) as a predictor of hospital stay duration in COVID-19 patients. Therefore, this aspect requires further investigation.

**Objective:** To analyze the glucose-to-lymphocyte ratio (GLR) as a predictor of the length of hospital stay among severe and critical COVID-19 patients at RSUP Dr. Sardjito.

**Methods:** This study was an analytical observational research with a retrospective cohort design using medical record data of severe and critical COVID-19 patients hospitalized at RSUP Dr. Sardjito from February to September 2021. A total of 166 patients met the inclusion and exclusion criteria.

**Results:** The GLR cut-off value determined from the ROC analysis was 287,73. Multivariate analysis showed that  $GLR \geq 287,73$  was significantly associated with a longer hospital stay ( $\geq 9$  days) (OR= 2,579;  $p= 0,008$ ; 95% CI: 1,281-5,192). In addition, urinary tract infection was also significantly associated with prolonged hospitalization (OR= 16,221;  $p= 0,01$ ; 95% CI: 1,936-135,891). Meanwhile, chronic kidney disease (CKD) appeared to be associated with a shorter length of stay (OR= 0,302;  $p= 0,025$ ; 95% CI: 0,106-0,858), a finding that was likely influenced by the categorization of hospitalization duration. Variables such as age, sex, and lymphocyte count were not significantly associated with the length of hospital stay.

**Conclusion:** The glucose-to-lymphocyte ratio (GLR) can be used as a predictor of hospital stay duration in severe and critical COVID-19 patients at RSUP Dr. Sardjito ( $p = 0.008$ ).

**Keywords:** COVID-19, severe and critical patients, glucose-to-lymphocyte ratio, length of stay, predictor