

INTISARI

Latar Belakang: Peningkatan insidensi pandemi COVID-19 menyebabkan tingkat mortalitas dan lama rawat yang cukup tinggi pada negara berkembang. Deteksi dini diperlukan untuk menekan angka mortalitas. Metode deteksi dini dilaporkan, seperti RT-PCR, immunoassay, dan CT-scan, tetapi memerlukan biaya mahal. Peningkatan BUN dengan penurunan albumin adalah kondisi laboratorium yang dihasilkan oleh keadaan inflamasi tinggi, seperti COVID-19. Hubungan rasio BUN-Albumin plasma penderita pneumonia terbukti dalam memprediksi mortalitas dan lama rawat lebih kuat dibandingkan dengan parameter tunggal BUN atau albumin. Jika terbukti berhubungan, penanda ini menguntungkan karena dapat diakses secara luas, sederhana, dan ekonomis.

Tujuan: Mengetahui hubungan antara rasio BUN-Albumin plasma terhadap mortalitas dan lama rawat pasien COVID-19 di RSUP Dr. Sardjito.

Metode: Rancangan penelitian dengan metode studi observasional kohort retrospektif pasien terkonfirmasi COVID-19 di RSUP Dr. Sardjito. Data kadar BUN dan albumin plasma saat admisi dikumpulkan untuk menghitung cut-off optimal menggunakan kurva ROC. Hubungan antara kadar rasio BUN-Albumin dengan mortalitas dianalisis dengan metode chi-square test dilanjutkan dengan regresi logistik pada analisis multivariat. Analisis terhadap lama rawat inap menggunakan analisis survival cox-regression dan dinyatakan signifikan apabila menghasilkan $p < 0,05$.

Hasil: Total subjek penelitian adalah 1650 pasien, dengan median usia 56 tahun. Nilai cut-off rasio BUN-Albumin dalam memprediksi mortalitas didapatkan 5,634, dengan sensitivitas 65,0% dan spesifisitas 63,7%. (AUC = 0,689; 95% CI 0,663-0,715; $p=0,001$). Analisis multivariat menunjukkan bahwa peningkatan rasio BUN-Albumin menjadi faktor yang independen dan signifikan sebagai prediktor mortalitas (OR 2,378; 95% CI 1,809 – 3,127) dan lama rawat pasien (HR 0,655; 95% CI 0,574 - 0,748; $p<0,001$). Usia, jenis kelamin, penggunaan oksigenasi tekanan positif, hipertensi, obesitas, PPOK, dan asma tidak secara independen berhubungan dengan mortalitas.

Kesimpulan: Peningkatan rasio BUN-Albumin secara independen dan signifikan berhubungan dengan peningkatan risiko mortalitas dan lama rawat inap pasien COVID-19.

Kata Kunci: COVID-19, rasio BUN-Albumin plasma, mortalitas, lama rawat

ABSTRACT

Background: The increasing incidence of the COVID-19 pandemic has caused quite high mortality rates and length of stay in developing countries. Early detection is needed to reduce mortality rates. Early detection methods are reported, such as RT-PCR, immunoassay, and CT-scan, but they are expensive. Elevated BUN with decreased albumin is a laboratory condition produced by highly inflammatory states, such as COVID-19. The relationship between the plasma BUN-Albumin ratio in pneumonia sufferers has been proven to predict mortality and length of stay more strongly than the single parameter BUN or albumin. If proven to be relevant, these markers are advantageous because they are widely accessible, simple, and economical.

Objective: To determine the relationship between plasma BUN-Albumin ratio on mortality and length of stay for COVID-19 patients at RSUP Dr. Sardjito.

Method: Research design using a retrospective cohort observational study method of patients with confirmed COVID-19 at Dr. RSUP. Sardjito. Data on BUN and plasma albumin levels at admission were collected to calculate the optimal cut-off using the ROC curve. The relationship between BUN-Albumin ratio levels and mortality was analyzed using the chi-square test method followed by logistic regression in multivariate analysis. Analysis of length of stay using cox-regression survival analysis and is declared significant if it produces $p < 0.05$.

Results: The total study subjects were 1650 patients, with a median age of 56 years. The cut-off value for the BUN-Albumin ratio in predicting mortality was found to be 5.634, with a sensitivity of 65.0% and a specificity of 63.7%. (AUC = 0.689; 95% CI 0.663-0.715; $p=0.001$). Multivariate analysis showed that an increase in the BUN-Albumin ratio was an independent and significant factor as a predictor of mortality (OR 2.378; 95% CI 1.809 - 3.127) and patient length of stay (HR 0.655; 95% CI 0.574 - 0.748; $p<0.001$). Age, sex, use of positive pressure oxygenation, hypertension, obesity, COPD, and asthma were not independently associated with mortality.

Conclusion: An increase in the BUN-Albumin ratio is independently and significantly associated with an increased risk of mortality and length of stay in COVID-19 patients.

Keywords: COVID-19, plasma BUN-Albumin ratio, mortality, length of stay