Model Skoring Lama Rawat berdasarkan Biomarker Serum pada Pasien Pneumonia Komunitas Sedang Berat = Scoring Model for Length of Stay Based on Serum Biomarkers in Moderate-Severe Community Acquired Pneumonia Patients

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Abstrak

Latar belakang : Pneumonia komunitas (PK) merupakan penyakit dengan angka kejadian morbiditas dan mortalitas yang tinggi secara global. Sebagai penyakit infeksi maka respons inflamasi bisa diukur melalui beberapa serum biomarker yang bisa digunakan sebagai prediktor untuk lama rawat. Identifikasi pasien risiko tinggi lama rawat yang panjang dengan menggunakan kombinasi beberapa serum biomarker diharapkan bisa menjadi acuan dalam intervensi yang cepat dan tepat termasuk didalamnya penggunaan antibiotik sehingga berpengaruh pada luaran klinis pasien PK.

Tujuan : Studi ini bertujuan untuk mendapat sistem skoring dengan menggunakan beberapa serum biomarker seperti prokalsitonin, C-reactive protein (CRP), leukosit, asam laktat, D-dimer dan albumin terhadap lama rawat pasien PK sedang berat

Metode : Studi ini menggunakan desain kohort prospektif pasien PK sedang berat yang dirawat di IGD/ICU/HCU RSUPN dr. Cipto Mangunkusumo periode Mei 2022 s/d Juli 2023. Variabel-variabel prediktor lama rawat pasien PK sedang berat didapatkan dari hasil analisis multivariat dengan regresi logistik.

Hasil : Dari total 360 subjek yang memiliki lama rawat > 14 hari sebanyak 204 subjek (56,67%) dan 14 hari sebanyak 156 subjek (44,44%). Variabel prediktor yang secara konsisten mempengaruhi lama rawat adalah asam laktat dengan RR 1,305 (IK 95% 1,097 – 1,551, p=0,003) dan albumin dengan RR 2,234 (IK 95% 1,164– 2,156, p=0,003). Performa determinan dengan analisis kurva ROC menunjukkan kemampuan prediksi lemah (AUC=0,629). Performa kalibrasi dengan uji Hosmer-Lemeshow test menunjukkan validasi baik (0,562). Biomarker lain yang dianggap signifikan dalam analisis bivariat yaitu prokalsitonin dengan RR 1,481 (IK 95% 1,121-1,954, p=0,006) dan C-reactive protein RR 2,465 (IK 95% 1,141-5,326). Leukosit dan D-dimer tidak dinilai signifikan sebagai biomarker PK sedang berat (p = 0,947).

Simpulan : Terdapat hubungan antara asam laktat dan albumin dengan lama rawat pasien PK sedang berat. Tidak terdapat model skoring lama rawat pasien PK sedang berat.
.....Background: Community-acquired pneumonia (CAP) is a disease with a high global incidence of morbidity and mortality. As an infectious disease, the inflammatory response can be measured through several serum biomarkers that can be used as predictors for the length of hospital stay (LOS). The identification of patients at high risk for prolonged hospitalization using a combination of several serum biomarkers is expected to serve as a reference for prompt and accurate interventions, including the use of antibiotics, thereby influencing the clinical outcomes of CAP patients.

Objective: This study aims to establish a scoring system using several serum biomarkers such as procalcitonin, C-reactive protein (CRP), leukocytes, lactic acid, D-dimer, and albumin for the length of hospital stay in patients with moderate to severe CAP.

Method: This study employs a prospective cohort design involving patients with moderate to severe CAP treated in the Emergency Department (ED), Intensive Care Unit (ICU), and High-Care Unit (HCU) at RSUPN dr. Cipto Mangunkusumo from May 2022 to July 2023. Variables to predict for the length of hospital stay in patients with moderate to severe CAP were obtained from multivariate analysis using logistic regression.

Results: A total of 360 subjects were included in this study, including 204 subjects (56.67%) with LOS more than 14 days, while 156 subjects (44.44%) had LOS of 14 days or less. The consistently influencing predictor variables for the length of hospital stay were lactate with RR 1.305 (95% CI 1.097–1.551, p=0.003) and albumin with RR 2.234 (95% CI 1.164–2.156, p=0.003). Determinant performance with ROC curve analysis showed weak predictive ability (AUC=0.629). Calibration performance with the Hosmer-Lemeshow test indicated good validation (0.562). Other biomarkers considered significant only in bivariate analysis were procalcitonin with RR 1.481 (95% CI 1.121–1.954, p=0.006) and C-reactive protein with RR 2.465 (95% CI 1.141–5.326). Leukocytes an D-dimer were not considered significant as a biomarker for moderate to severe CAP (p=0.947).

Conclusion: There is a relationship between lactate and albumin with the length of hospital stay in patients with moderate to severe CAP. However, there is no scoring model for the length of hospital stay in these patients.