

Latar belakang

COVID-19 merupakan penyakit infeksi virus yang telah menjadi pandemi dengan manifestasi klinis yang luas. Beberapa penelitian menunjukkan terjadinya disregulasi sistem imun pada pasien COVID-19 yang disebabkan oleh hiperinflamasi. Disregulasi sistem imun ini dapat berkembang menjadi badai sitokin dan keadaan hiperkoagulabilitas sehingga memperburuk derajat keparahan COVID-19. *Neutrophyl Lymphocyte Ratio* (NLR) dapat menggambarkan disregulasi sistem imun dan menjadi tanda peringatan pada pasien COVID-19 gejala ringan serta diprediksi memiliki hubungan dengan kejadian mortalitas maupun lama rawat inap pasien COVID-19. Pengukuran NLR merupakan pemeriksaan pemeriksaan darah yang sederhana sehingga mudah diaplikasikan dalam praktik klinis sehari-hari.

Tujuan

Mengetahui hubungan NLR dengan mortalitas di rumah sakit dan lama rawat inap pada pasien COVID-19 di RSUP Dr. Sardjito.

Metode

Observasional kohort retrospektif dilakukan dengan mengambil data sekunder dari rekam medis pasien terkonfirmasi COVID-19 yang dirawat di RSUP Dr. Sardjito selama April 2020 – Maret 2021. *Cut-off point* NLR ditetapkan menggunakan ROC dan *Youden's Index*. Analisis *survival* Kaplan Meier dilakukan untuk mengetahui hubungan antara NLR dengan mortalitas dan lama rawat inap. Hubungan antara NLR dan faktor lain yang mempengaruhi mortalitas dan lama rawat inap dianalisis secara univariat dan multivariat menggunakan *Cox regression*.

Hasil

Total subjek penelitian adalah 273 pasien yang memenuhi kriteria inklusi dan eksklusi. *Cut-off point* ditetapkan senilai 7,62, dengan jumlah subjek penelitian NLR <7,62 sebanyak 190 pasien dan NLR \geq 7,62 sebanyak 83 pasien. Analisis multivariat menunjukkan bahwa subjek yang memiliki nilai NLR tinggi (\geq 7,62) secara independen dan signifikan lebih berisiko untuk mengalami kematian (HR 3,345, $p < 0,001$). Pasien dengan NLR \geq 7,62 secara signifikan memiliki lama rawat inap yang lebih lama, dengan median 23 hari untuk NLR \geq 7,62 dan 19 hari untuk <7,62 ($p = 0,027$). Akan tetapi, analisis multivariat tidak membuktikan NLR sebagai faktor yang paling memengaruhi lama rawat inap ($p = 0,090$).

Kesimpulan

NLR tinggi \geq 7,62 secara independen dan signifikan berhubungan dengan peningkatan risiko mortalitas. Analisis univariat menunjukkan bahwa NLR tinggi \geq 7,62 secara signifikan terkait dengan lama rawat inap yang lebih lama pada pasien COVID-19, tetapi bukan sebagai faktor yang paling memengaruhi lama rawat inap.

Kata Kunci

COVID-19, NLR, mortalitas, lama rawat inap

ABSTRACT

Background

COVID-19 is a pandemic infectious disease and has a wide spectrum of clinical manifestations. Asymptomatic. Several studies reported that COVID-19 patients have a malfunction of the immune system that is caused by hyper inflammation as the effect of viruses. This malfunction will progress to a cytokine storm and hypercoagulable state, thus worsening the severity of the disease. Therefore, NLR, which reflects immune system malfunction, can be a warning sign of early stages of COVID-19 and is predicted to have a good association with predicting mortality and length of stay of COVID-19 patients. Measurement of NLR is easy to apply to daily clinical practice. This is provident and useful as examined and contemplated the treatment of COVID-19 patients, which can be used to prognosticate the mortality rate and length of stay that is needed.

Aim

To study the relationship between NLR and mortality and length of stay in COVID-19 patients at Dr. Sardjito.

Methods

Retrospective cohort observational studies were conducted by taking secondary data from medical records of confirmed COVID-19 patients treated at Dr. Sardjito hospital between April 2020 – March 2021. The value of NLR is defined as Neutrophil (/L) / Lymphocyte (/L). Cut-off point NLR was determined using the ROC curve and Youden's Index. We performed survival analysis using Kaplan Meier to investigate the relation between NLR with mortality and length of stay. The relation between NLR and other factors that affected mortality and LOS was analyzed using Cox regression.

Result

The total study subjects were 273 patients who met the inclusion and exclusion criteria. The cut-off point NLR was set at 7.62. Among 273 patients, patients with $NLR < 7.62$ were 190, and $NLR \geq 7.62$ were 83 patients. Compared with the low NLR group, subjects with $NLR \geq 7.62$ were independently and significantly at higher risk of death (HR 3,345, $p < 0,001$). LOS significantly was different between groups of subjects, with the median LOS for subjects with $NLR \geq 7.62$ was 23 and $NLR < 7.62$ was 19 ($p = 0,027$). However, multivariate analysis found that NLR was not the most important factor in determining the length of stay ($p = 0,090$).

Conclusion

A high $NLR \geq 7.62$ was independently and significantly associated with an increased risk of mortality. Univariate analysis showed that high $NLR \geq 7.62$ was significantly associated with a longer hospital stay in COVID-19 patients, but not as the most important factor in determining the length of stay.

Keywords:

COVID-19, NLR, mortality, length of stay.