

ABSTRACT

Background: Throughout this COVID-19 pandemic, studies have reported that the prognosis of the infection are worse in those with high glucose plasma levels as both SARS-CoV-2 infection and hyperglycemia induce systemic inflammation. Neutrophil-to-Leukocyte ratio (NLR), a known marker of inflammation, is used to see the association between glucose levels and inflammatory response which contributes to the declining outcome of COVID-19 infection.

Methods: A research population of severe and critical adult COVID-19 patients in RSUP dr. Sardjito in 2021 will be included in this retrospective cross sectional study according to their glucose plasma level and NLR, with glucose plasma level as the independent variable and NLR as the dependent variable. The confounding variables potential are age, BMI, and blood pressure. There are three types of analysis statistics which includes univariate (distribution and frequency), bivariate (Chi Square test or fisher's extract test) and multivariate (multiple linear regression).

Aim: To evaluate the relationship between glucose plasma level and NLR in severe and critical COVID-19 patients.

Result: This study involved 128 patients (72 men, 56 women) with a mean age of 55.570 ± 14.389 years. An NLR cut-off value of 14.77 for 57.45% sensitivity were revealed and through Kolmogorov-Smirnov test, it was found that plasma glucose levels are not normally distributed. Furthermore, an ROC curve was also made to find the cut-off score of plasma glucose level (275) against mean NLR. For bivariate analysis, Mann-whitney analysis showed no significant difference on mean NLR between different plasma glucose groups and Fischer's Exact test revealed that those with plasma glucose level ≥ 200 and plasma glucose level > 275 is twice more likely to have NLR levels of more than or equal to 14.775.

Conclusion: There is no significant mean difference. However, there is a significant association between the cut-off scores of admission plasma glucose levels (275) and NLR (14.775) in severe-critical COVID-19 patients.

Keyword: hyperglycemia, NLR, coronavirus, COVID-19