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The Association Between Neutrophil-to-Lymphocyte Ratio and Mortality in Critically Ill Patients: A Retrospective Cohort Study

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Objectives: The neutrophil-to-lymphocyte ratio (NLR) is a complete blood count (CBC) derived parameter that has been shown to be associated with outcomes in patients with several different clinical conditions. The objective of this study was to assess the association among NLR and mortality in a population of adult critically ill patients.

Methods: We performed an observational cohort study of unselected intensive care unit (ICU) patients based on records in a clinical database. We calculated discrete patient NLR. The association of NLR and ICU mortality was assessed using multivariable logistic regression. Secondary outcomes included in-hospital mortality and association of mortality with other CBC derived parameters like neutrophil-to-platelet ratio (NPR). A subgroup analysis of patients with versus without sepsis, patients with and without malignancies including hematologic and patients with and without steroid treatment at the time of admission was performed to assess any differences in the relationship between the NLR and outcomes in these cohorts.

Results: A total of 653 patients were included. Their ICU mortality rate was 40.4%. The mean age of the cohort was 60±17 years, and 58.5% were male. The median NLR for the entire cohort was 10.5 (interquartile range, 5 to 20.5). Following multivariable adjustments, NLR and NPR were not associated with ICU mortality and in-hospital mortality. Only in a subgroup of patients without malignancy and steroid treatment whose neutrophil count greater than 1000, NPR was found to be associated with ICU mortality (odds ratio: 0.001, 95% confidence interval: 0.001-0.064, p=0.02).

Conclusion: No significant correlation was found between NLR and ICU mortality in unselected patients. In a strictly selected subgroup of patients only NPR was associated with mortality.

Keywords: Critically ill patients, mortality, neutrophil, lymphocyte