

The Significance of Neutrophil to Lymphocyte Ratio and the Other Infection Markers on Predicting Bacteremia and Prognosis in Patients Diagnosed with SIRS and Sepsis in Intensive Care Unit

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Background

In this study it is aimed to evaluate the prognostic and diagnostic value of neutrophil-to-lymphocyte ratio (NLR), neopterin (NPT), pro-adrenomedullin (pro-ADM) and the other infection markers to determine bacteremia and prognosis in patients with SIRS, sepsis and septic shock.

Methods

A prospective study was conducted on patients with SIRS, sepsis and septic shock in intensive care unit at a tertiary care center between December 2014-July 2015. ESICM consensus criteria (2012) were used in the diagnosis of sepsis. Blood cultures and blood samples for NPT, pro-ADM and the other infection markers were taken within the first 24 hours of their admission.

The NLR was calculated using neutrophil and lymphocyte levels.

Results

Totally 156 patients who had been diagnosed as SIRS (10.9%), sepsis (44.2%), and septic shock (44.9%) were included in the study. The study group was consisted of 64 (41%) bacteremic patients and the control group was consisted of 92 (59%) non-bacteremic patients. Blood cultures were yielded in 64 patients, 31 (48.4%) of them were gram positive, 37 (57.8%) of them were gram negative bacteria, respectively [E. coli (20.3%), A. baumannii (17.2%), coagulase-negative staphylococci (18.8%) and S.aureus(14.1%)]. NLR, NPT and pro-ADM levels were insignificant in predicting bacteremia ($p < 0.05$) (Table 1).

The mortality rate of patients with sepsis and bacteremia (43.9%) was significantly higher compared to patients without bacteremia (20.8%) ($p = 0.001$). In contrast to this finding, the mortality rate in bacteremic patients with septic shock (56.1%) was significantly lower compared to non-bacteremic septic shock patients (66.0%) ($p = 0.021$). Only procalcitonin levels were significant predictor of mortality ($p = 0.000$).

Conclusion

Combination of these markers will be more useful to predict sepsis, bacteremia and mortality. These markers may be useful in reducing mortality by revealing the necessity of treatment or nonresponse to treatment at an early stage

Table 1. ROC analysis of NLR, NPT and pro-ADM levels for predicting bacteremia

	(Area)	(p)	(95% CI)		Cut-off	Sensitivity	Specificity
NLR	0.455	0.337	0.362	0.547	39.41	9.4	93.5
NPT	0.565	0.167	0.473	0.657	7.22	71.9	41.3
Pro-ADM	0.564	0.172	0.472	0.657	367.60	62.5	50.0