

Sum Of Mean Platelet Volume and Blood Urea Nitrogen (SMB) As A Novel Predictor of Mortality In Acute Myocardial Infarction

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Aim:

Both mean platelet volume (MPV) and blood urea nitrogen (BUN) were studied separately and estimated to have a predictive value for prognosis in patients with acute myocardial infarction (AMI).

We aimed in this study to determine the value of summation of both biomarkers in risk stratification and prediction of early outcomes and mortality among patients with AMI.

Methods and Results:

We perform a retrospective study involving 2997 patients with AMI who had been admitted to our facility between January 2015 to December 2020. MPV and BUN measurements were obtained on routine admission blood tests of those patients. SMB was calculated as (MPV in fL+ BUN in mg/dl). Subjects are further grouped as those with high SMB and low SMB according to the detected cut of value. The cut-off value of SMB in this study was 27, determined with ROC curve analysis, the area under the curve (AUC) equalled 0.74. The sensitivity and specificity for SMB were 76%, and 72% respectively.

The diagnostic odds ratio (DOR) was 5.166 (95% CI; 3.146 – 8.482) and relative risk (RR) was 2.59 (95% CI; 1.78 – 3.77).

Patients with SMB>27 had a higher prevalence of diabetes, hypertension, and cerebrovascular accident history. They similarly had a higher incidence of left main and multivessel coronary stenosis. The high MAB group had a highly significant ($p<0.001$) increase in all post-AMI in-hospital complications including pulmonary edema, cardiogenic shock, intubation, ventilation, and cardiac arrest (8.3% vs 3.5%, $p<0.001$ for SMB>27 and SMB≤27, respectively).

Post-primary PCI left ventricular systolic function was significantly impaired among the high SMB group (39 ± 11.4 vs 41.9 ± 10.4 , $p<0.001$), with more prolonged in-hospital stay (6.36 ± 7.8 vs 5.23 ± 7.9 , $p<0.001$) and higher mortality (5.7% vs 1.2%, $p<0.001$) in comparison to lower SMB group. Regression analysis showed that MAB was a highly significant predictor of mortality among our patients ($p<0.001$).

Conclusion:

The sum of mean platelet volume and blood urea nitrogen (SMB) is a cheap and feasible test that can be used for early risk stratification of patients with AMI. SMB is an independent predictor of mortality with good sensitivity and specificity at a cut-off value of 27.