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A new risk scoring model for prediction of poor coronary collateral circulation in acute non-ST elevation myocardial infarction

Mehmet Ileri
Ankara Numune Training and Research Hospital, Turkey

Aim: We aimed to investigate the clinical features associated with development of coronary collateral circulation (CCC) in patients with acute non-ST elevation myocardial infarction (NSTEMI) and to develop a scoring model for predicting poor collateralization at hospital admission.

Methods: The study enrolled 224 consecutive patients with NSTEMI admitted to our coronary care unit. Patients were divided into poor (grade 0 and 1) and good (grade 2 and 3) CCC groups.

Results: In logistic regression analysis, presence of diabetes mellitus, total white blood cell (WBC) and neutrophil counts and neutrophil to lymphocyte ratio (NLR) were found as independent positive predictors of poor CCC, whereas older age (≥70 years) emerged as a negative indicator. The final scoring model was based on five variables which were significant at $P<0.05$ level following multivariate analysis. Presence of diabetes mellitus, and elevated total WBC (≥7.85x10^3/μL) and neutrophil counts (≥6.25x10^3/μL) were assigned with 2 points; high NLR (≥4.5) with 1 point and older age (≥70 years old) with -1 point. Among 30 patients with risk score ≤1, 29 had good CCC (with a 97% negative predictive value). On the other hand, 139 patients had risk score ≥4; out of whom, 130 (with a 93.5% positive predictive value) had poor collateralization. Sensitivity and specificity of the model in predicting poor collateralization in patients with scores ≤1 and ≥4 were 99.2% (130/131) and +76.3 (29/38), respectively.

Conclusion: This study represents the first prediction model for degree of coronary collateralization in patients with acute NSTEMI.

maraspoli2020@gmail.com