Risk Stratification of Patients Undergoing Percutaneous Coronary Intervention

Naveen Kumar Murki[1]

[1]Department of Interventional Cardiology, Citi Heart Center, Hyderabad, India

Ind J Car Dis Wom 2021;6:33–34.

The field of interventional cardiology has witnessed enormous change in the armamentarium of hardware and the technique of percutaneous coronary intervention (PCI). There has always been an unmet need for developing feasible risk score to predict the major adverse cardiovascular events in patients planned for PCI. These days PCI is in vogue as the method of revascularization in complex coronary lesions, often in high-risk patients.

In this original article titled "Factors influencing survival outcomes in patients with left ventricular dysfunction after coronary revascularization," the author has tried to correlate the factors responsible for major adverse cardiovascular events (MACE), in severe LV dysfunction (EF < 30%) patients undergoing percutaneous intervention.

The study was a single-center prospective study. Severe LV dysfunction patients who underwent percutaneous transluminal coronary angioplasty (PTCA) were included in the study and followed up for one year. At the end of one year, the impact of gender, age, hypertension (HTN), obesity, cerebrovascular accident (CVA), type 2 diabetes mellitus (DM), chronic kidney disease (CKD), hypothyroidism, smoking, and alcohol intake on one-year mortality and MACE were analyzed. The MACE included nonfatal reinfarction, recurrence of angina, repeat PCI or coronary artery bypass grafting (CABG), and heart failure. These factors were statistically analyzed and approached to observe the impact of those risk factors on one-year mortality. It was also observed whether the timing and mode of revascularization and the number of coronary arteries involved had any influence on mortality or MACE. To compare different parameters of the study with respect to mortality, a regression analysis was made at the end of one year.

It was observed that in patients with severe LV dysfunction, no significant relationship could be ascertained between the mortality or MACE and gender, age, DM, HTN, CKD, alcohol intake, or smoking at the end of one year after revascularization. MACE or mortality may be attributed directly to left ventricular dysfunction itself, and the observed mortality was higher than that in patients with normal LV function. Hence, in this study, it was observed that LV dysfunction is the cause of mortality in the study population but not the other associated variables.

The limitations of the study, as already mentioned, are that it is a single-center study and followed patients for one year, and the sample being from a single center may not represent geographic and social heterogeneity to apply for generalization.

In The Texas Heart Institute risk score,[1] data collected from 9,494 patients who underwent PCI were analyzed. Predictors of MACE—death, myocardial infarction, stroke, and repeat revascularization by emergency CABG or PCI—were identified by multivariate logistic regression analysis using baseline clinical, angiographic, and procedural variables. A simple integer score was constructed by multiplying the β coefficient for each variable by a constant and rounding the result to the nearest integer. Validation of the score was done by applying it in 5,545 patients who underwent PCI. Multivariate regression analysis identified urgent procedure, type C lesion, thrombus, unstable angina, acute myocardial infarction, renal insufficiency, HTN, emergent procedure, congestive heart failure, peripheral vascular disease, and number of stents placed as independent predictors of adverse events after PCI. The model had good overall discrimination (area under the receiver operator characteristic curve 0.701), and the model fitted the validation cohort adequately.

Risk–benefit analysis is essential, both for the patient and the treating doctor, to be able to select the best strategy for management out of the available ones; hence, a reliable risk score that can be used as a simple bedside tool is the need of the hour to predict MACE after PCI. Several risk scores are being developed in the past for prediction of MACE after PCI.[2-9] Some of the models were developed in the era of bare

Address for correspondence
Naveen Kumar Murki, MD, DM, Department of Interventional Cardiology, Citi Heart Center, Hyderabad, Telangana 500034, India
(e-mail: naveenjust@gmail.com).

DOI https://doi.org/10.1055/s-0041-1728183

published online
April 13, 2021

Thieme Medical and Scientific Publishers Pvt. Ltd. A-12, 2nd Floor, Sector 2, Noida-201301 UP, India

metal stents and were designed to predict mortality only. With ever-changing technology and its application, predicting MACE by risk stratification models is always challenging target. The best risk stratification score should always be feasible to apply at beside and it should take into consideration clinical, angiographic, and procedural parameters (number of stents used, type of stents used, physiological assessment usage, imaging usage, etc.); hence, there is always a scope and possibility for the development of such scores.

Conflict of Interest
None declared.

References

1 Madan P, Elayda MA, Lee VV, Wilson JM. Predicting major adverse cardiac events after percutaneous coronary intervention: the Texas Heart Institute risk score. Am Heart J 2008; 155(6):1068–1074
2 Hannan EL, Racz M, Ryan TJ, et al. Coronary angioplasty volume-outcome relationships for hospitals and cardiologists. JAMA 1997;277(11):892–898
3 Ellis SG, Weintraub W, Holmes D. Shaw R, Block PC, King SB III. Relation of operator volume and experience to procedural outcome of percutaneous coronary revascularization at hospitals with high interventional volumes. Circulation 1997; 95(11):2479–2484
4 O'Connor GT, Malenka DJ, Quinton H, et al; Northern New England Cardiovascular Disease Study Group. Multivariate prediction of in-hospital mortality after percutaneous coronary interventions in 1994–1996. J Am Coll Cardiol 1999;34(3): 681–691
5 Moscucci M, Kline-Rogers E, Share D, et al. Simple bedside additive tool for prediction of in-hospital mortality after percutaneous coronary interventions. Circulation 2001;104(3): 263–268
6 Resnic FS, Ohno-Machado L, Selwyn A, Simon DI, Popma JJ. Simplified risk score models accurately predict the risk of major in-hospital complications following percutaneous coronary intervention. Am J Cardiol 2001;88(1):5–9
7 Shaw RE, Anderson HV, Brindis RG, et al. Development of a risk adjustment mortality model using the American College of Cardiology-National Cardiovascular Data Registry (ACC-NCDR) experience: 1998-2000. J Am Coll Cardiol 2002;39(7): 1104–1112
8 Qureshi MA, Safian RD, Grines CL, et al. Simplified scoring system for predicting mortality after percutaneous coronary intervention. J Am Coll Cardiol 2003;42(11):1890–1895
9 Singh M, Lennon RJ, Holmes DR Jr, Bell MR, Rihal CS. Correlates of procedural complications and a simple integer risk score for percutaneous coronary intervention. J Am Coll Cardiol 2002; 40(3):387–393

