Editorial / *Editöryal Yorum*

Angiographic scoring systems in patients with acute myocardial infarction

Akut miyokart enfarktüslü hastalarda anjiyografik skorlama sistemleri

Gülten Taçoy, M.D.

Department of Cardiology, Gazi University Faculty of Medicine, Ankara

ST-segment elevation myocardial infarction (STEMI) is a major cause of death, and the management of STEMI with mechanical reperfusion therapy may improve ventricular function and the mortality rate. Primary percutaneous coronary intervention (PCI) is a preferred treatment in approaching STEMI.[1]

Myocardial area-at-risk (AAR) is determined as the area of impaired perfusion due to acute myocardial infarction (AMI).[2] Initial AAR and final infarction size are predictive of major cardiovascular events. Determination of AAR is crucial in patients with STEMI for prospective risk estimation. Numerous scoring systems have been proposed,[3-7] and magnetic resonance imaging (MRI) is the preferred technique to determine the AAR in patients with AMI.[7] The Bypass Angioplasty Revascularization Investigation (BARI) Myocardial Jeopardy Index and the Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease (APPROACH) scores are alternative imaging systems for the evaluation of the AAR during coronary angiography.[4-6] BARI index score is linked with the length and caliber of the terminal arteries.[4] APPROACH score is associated with the location of the culprit artery and dominance and size of the secondary branches.[5,6] Moral et al.[6] found a good correlation between BARI and APPROACH scores regarding AAR. Furthermore, they showed a correlation between angiographic scores and MRI sequences in patients with STEMI who underwent primary PCI.[6]

In the current issue of the Archives of the Turkish Society of Cardiology, Agac et al.[8] proposed an angiographic scoring system – the Relative Importance Index (RII). They first measured the proximal segment diameter of the left anterior descending (LAD), circumflex (Cx) and right coronary (RCA) arteries, and then the sum of the diameters of these arteries. RII of the culprit lesion was calculated by dividing the culprit artery diameter by the sum of the coronary artery diameters. In this scoring system, increased culprit lesion diameter was associated with lower left ventricular ejection fraction (LVEF). Although there existed a tendency for higher mortality and non-fatal MI rates in patients with higher RII values, it was not statistically significant due to the small sample size and short follow-up period.

Abbreviations:

AAR	*Area-at-risk*
AMI	*Acute myocardial infarction*
APPROACH	*Alberta Provincial Project for Outcome Assessment in Coronary Heart Disease*
BARI	*Bypass Angioplasty Revascularization Investigation*
Cx	*Circumflex*
LAD	*Left anterior descending*
LVEF	*Left ventricular ejection fraction*
MRI	*Magnetic resonance imaging*
PCI	*Percutaneous coronary intervention*
RCA	*Right coronary arteries*
RII	*Relative Importance Index*
STEMI	*ST-segment elevation myocardial infarction*

Previous studies have shown that in STEMI patients, a culprit lesion located in proximal parts of the left coronary circulation is associated with worse car-

Correspondence: Dr. Gülten Taçoy. Gazi Üniversitesi Tıp Fakültesi, Kardiyoloji Anabilim Dalı, Beşevler, 06500 Ankara.
Tel: +90 312 - 202 56 33 e-mail: gtacoy@yahoo.com

diovascular outcomes.[9,10] The authors of the present study similarly assessed the impact of a culprit lesion located in the proximal part of the LAD. However, the strength of this study is that, unlike previous studies that measured the diameter of a single coronary vessel, this study assessed the entire coronary bed. By proportioning the LAD diameter to the diameter of the entire coronary bed. this study provides a detailed evaluation of the impact of this ratio on the myocardial blood supply.

In conclusion, this simple scoring system may offer a more accurate evaluation of the AAR. Although the authors did not evaluate this scoring system for culprit lesions in the CX and RCA and compare with MRI results, this simple method may predict adverse clinical outcome and decreased LV systolic function in patients with acute anterior MI.

Conflict-of-interest issues regarding the authorship or article: None declared.

REFERENCES

1. Van de Werf F, Bax J, Betriu A, Blomstrom-Lundqvist C, Crea F, Falk V, et al. Management of acute myocardial infarction in patients presenting with persistent ST-segment elevation: the Task Force on the Management of ST-Segment Elevation Acute Myocardial Infarction of the European Society of Cardiology. Eur Heart J 2008;29:2909-45. CrossRef
2. Lowe JE, Reimer KA, Jennings RB. Experimental infarct size as a function of the amount of myocardium at risk. Am J Pathol 1978;90:363-79.
3. van Gaal WJ1, Ponnuthurai FA, Selvanayagam J, Testa L, Porto I, Neubauer S, et al. The Syntax score predicts periprocedural myocardial necrosis during percutaneous coronary intervention. Int J Cardiol 2009;135:60-5. CrossRef
4. Alderman EL, Stadius M. The angiographic definitions of the Bypass Angioplasty Revascularization Investigation. Coronary Artery Disease 1992;3:1189-207.
5. Brandt PW, Partridge JB, Wattie WJ. Coronary arteriography; method of presentation of the arteriogram report and a scoring system. Clin Radiol 1977;28:361-5. CrossRef
6. Moral S, Rodríguez-Palomares JF, Descalzo M, Martí G, Pineda V, Otaegui I, et al. Quantification of myocardial area at risk: validation of coronary angiographic scores with cardiovascular magnetic resonance methods. Rev Esp Cardiol (Engl Ed) 2012;65:1010-7. CrossRef
7. Rakowski T, Legutko J, Kleczynski P, Brzozowska-Czarnek A, Dziewierz A, Siudak Z, et al. Angiographic perfusion score assessed in patients with acute myocardial infarction is correlated with cardiac magnetic resonance infarct size and N-terminal pro-brain natriuretic peptide in 6-month follow-up. J Thromb Thrombolysis 2010;30:441-5. CrossRef
8. Agac MT, Agac S, Korkmaz L, Erkan H, Turan T, Bektas H, et al. A simple angiographic index to predict adverse clinical outcome associated with acute myocardial infarction. Turk Kardiyol Dern Ars 2014;42:321-9.
9. Harjai KJ1, Mehta RH, Stone GW, Boura JA, Grines L, Brodie BR, et al. Does proximal location of culprit lesion confer worse prognosis in patients undergoing primary percutaneous coronary intervention for ST elevation myocardial infarction? J Interv Cardiol 2006;19:285-94. CrossRef
10. Klarich KW, Christian TF, Higano ST, Gibbons RJ. Variability of myocardium at risk for acute myocardial infarction. Am J Cardiol 1999;83:1191-5. CrossRef