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Authors: Rahul Choudhary, Shashi M. Sharma

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# Predicting the culprit artery in acute inferior wall STEMI using ST segment elevation in leads V7-9 and accessing the significance of previously published criteria

Rahul Choudhary[1,*], Shashi M Sharma[1]

[1] Department of Cardiology, Sawai Man Singh Medical College, Jaipur, Rajasthan, India.

[*]Corresponding author, Email-rahulanna@gmail.com

In acute inferior wall ST segment elevation myocardial infarction(STEMI) , either the right coronary artery (RCA) or the left circumflex coronary artery (LCX) may contain the culprit lesion, and mortality and morbidity in part are determined by the location of the occlusion[1,2]. In patients with inferior wall MI who have right ventricular infarction, the culprit artery virtually always is the RCA.[3] Such patients are at increased risk for death,[5,6] shock,[4-6] and arrhythmias,[5-7] including atrioventricular block. Thus, early diagnosis and prediction of the culprit artery helps define those in whom aggressive reperfusion strategies are likely to yield the most benefit. Coronary arteriography is the best means of determining the culprit artery in acute inferior wall MI. When both the RCA and LCX are severely diseased, however, deciding which is the culprit can be difficult, and many a times angioplasty had being performed on a chronic lesion while the acute occlusion was ignored. In such circumstances having an independent predictor of the culprit artery, such as the ECG, can be very helpful. Several studies [2, 3, 8-15] have proposed ECG criteria to aid in identifying the culprit artery in acute inferior wall MI.

Fiol et al [16] retrospectively correlated ECG and angiographic findings of the culprit artery in 63 consecutive patients admitted with inferior wall STEMI. The sensitivity, specificity, and positive and negative predictive values for different ECG criteria were analyzed individually and in combination to determine the most sensitive algorithm to predict the culprit artery in inferior wall STEMI. Tierala et al [17] conducted an ECG sub study of the Helsinki Area AMi treatment re-evalUation (HAAMU) Trial, a nonrandomized prospective acute STEMI trial, and they evaluated a new algorithm to predict the culprit artery among the 98 patients with inferior STEMI included in the study.

Posterior leads V7, V8 and V9 are usually ignored but it is suggested that these leads can provide information that is useful for characterization of inferior wall STEMI. ST elevation in inferior and posterior leads (V7, V8 and V9) is usually associated with occlusion of the left circumflex artery with the involvement of large infarct zone and complications [18, 19]. Additional information gained from these leads can increase our accuracy to predict infarct related artery in acute inferior wall STEMI.

Our purpose is to review proposed ECG algorithms for predicting the culprit artery in inferior STEMI, especially those by Fiol et al and Tierala et al, and apply their algorithms as well as our own (based on ST segment elevation in lead V7-9 and ratio of ST segment elevation in lead II and lead III) to study population and compare their abilities to predict the culprit artery.