

Location of the Culprit Artery in Acute Myocardial Infarction using the ECG

Abdul Waduud, Elaine Clark*, Alexander Payne, Colin Berry, Maria Sejersten, Peter Clemmensen and Peter Macfarlane

University of Glasgow
Glasgow, UK

Aims: This study aimed to assess the accuracy of current ECG criteria for locating the coronary artery principally involved in an acute myocardial infarction (AMI), namely the left anterior descending coronary artery (LAD), the right coronary artery (RCA) and the left circumflex coronary artery (LCx), in order to assess the merits of implementing current AHA/ACC/ESC/HRS recommendations to determine and state the culprit artery on an ECG interpretation. **Methods:** 12 lead ECGs taken by paramedics in two regions - one around Copenhagen, Denmark and one around Glasgow, UK - were retrospectively analysed along with corresponding coronary angiograms. Men and women of all ages were included if they had an occlusion greater than 75%, observed during angiography, in only one coronary vessel. Patients who had a coronary artery bypass graft (CABG) or insufficient data available were excluded. All eligible patients were suspected of having an acute coronary event. ST amplitude at the J-point, as measured by computer techniques, was used to test ECG criteria, identified from the literature, in order to assess their sensitivity (SE), specificity (SP), positive predictive value (PPV) and negative predictive value (NPV) with respect to locating the culprit artery. **Results:** Of the 379 patients included in this study, 147 had an LAD occlusion, 170 an RCA occlusion, 31 an LCx occlusion and 31 another occlusion. 51 criteria were identified and tested, of which 4 distinguished LAD occlusions and the remainder aimed to detect LCx and RCA occlusions. The best criterion for predicting LAD occlusion had SE 74.1%, SP 96.1%, PPV 92.4%, NPV 85.4%. For RCA and LCx, the best results were SE 74.1%, SP 90.9%, PPV 86.9%, NPV 81.2% and SE 35.5%, SP 94.8%, PPV 37.9%, NPV 94.3% respectively. **Conclusion:** ECG criteria exist which predict the culprit artery in AMI with a modest degree of accuracy, making it meaningful to implement current recommendations.