

Body Surface Potential Mapping Improves Diagnosis of Acute Myocardial Infarction in those with Significant Left Main Coronary Artery Stenosis

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Non-invasive diagnosis of LMCA stenosis is challenging. Acute myocardial infarction (AMI) as a consequence of LMCA obstruction has a poor prognosis and thus early diagnosis is essential to expedite prompt revascularisation.

Methods: Patients presenting pre- and in-hospital between 2000-9 with acute chest pain were analysed. Those included had a 12-lead ECG and body surface potential map (BSPM) recorded at presentation, cardiac troponin T (cTnT) assessed 12 hours and coronary angiography. AMI was defined as cTnT 0.03g/L. STE on 12-lead ECG was defined using the Minnesota criteria. STE in aVR was 0.5mm, STD was 1mm and TWI was 3mm in 2 contiguous leads. STE on BSPM was defined as 1mm in the anterior, lateral, inferior, right ventricular or high right anterior territories and 0.5mm in the posterior territory. Significant LMCA stenosis was defined as 70% luminal narrowing at angiography.

Results: One hundred and eight patients had significant LMCA stenosis and were aged $67 \pm SD 11$ yrs (84% male). Eight were excluded due to lack of BSPM. Of the remaining 100 patients, AMI occurred in 83 (83%). Of these 83 patients, STE on 12-lead ECG occurred in 9: sensitivity 11%, specificity 88% for AMI. STE in aVR occurred in 17/83 (sensitivity 20%, specificity 88%), TWI in 26/83 (sensitivity 31%, specificity 76%) and STD in 41/83 (sensitivity 49%, specificity 71%). STE on BSPM occurred in 77/83: sensitivity 93%, specificity 71% for AMI diagnosis. Of those with STE on BSPM, STE occurred in either the high right anterior, right ventricular or posterior territories in 60 (78%) patients. Of these 60, 35 (58%) patients had STE in the high right anterior region (positive predictive value 91% for AMI diagnosis).

Conclusion: In patients with acute chest pain and significant LMCA stenosis, STE on BSPM has an improved sensitivity (93%) over 12-lead ECG in the diagnosis of AMI.