ACCURACY OF NON-ENHANCED CARDIAC COMPUTED TOMOGRAPHY TO DETECT MYOCARDIAL INFARCTS.

ACC Poster Contributions
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Background: Cardiac Computed Tomography (CT) is a promising technique for imaging coronary arteries and myocardium. Studies have shown contrast-enhanced CT angiography to be comparable to Myocardial Perfusion Imaging (MPI) in detecting irreversible perfusion defects (myocardial infarction [MI]). Our study evaluates whether non-enhanced computed tomography (coronary artery calcium [CAC] scanning) can detect irreversible perfusion defect (MI) as compared to MPI as a reference.

Methods: 62 symptomatic patients with irreversible perfusion on MPI underwent CAC scanning and their non-enhanced CT images were studied. Two blinded readers reviewed all the images. Irreversible perfusion defect was detected visually based on areas of hypo-attenuation (dark) in the myocardium and reconfirmed by decreased Hounsfield units. The left ventricle was divided into four regions - septal, anterior/apical, lateral and inferior to assess infarct. Irreversible perfusion defect was assessed per patient and per infarct region. The accuracy of the non contrast-enhanced CT to detect irreversible perfusion defect was assessed as compared to MPI as a reference.

Results: On a patient-based model, the non contrast-enhanced CT accurately detected irreversible perfusion defect in 59 subjects with sensitivity of 95.2% and a positive predictive value (PPV) of 100%. On a region-based model, out of the 102 infarct regions detected by MPI, non-enhanced CT detected 91 infarct regions accurately, underestimated 11 regions and overestimated 12 regions giving it a sensitivity of 89.2%, specificity of 85.7%, PPV of 88.3% and negative PV of 81.8% to detect accurate infarct region.

Conclusions: The preliminary results of this study demonstrate that the non-enhanced CT has an excellent agreement with MPI as reference in detecting irreversible perfusion defect. This study highlights a novel clinical utility of non-enhanced CT in addition to assessment of overall burden of atherosclerosis measured by CAC and provides evidence that it can accurately detect irreversible perfusion defects. Further prospective studies are warranted to evaluate the role of CAC scanning in infarct assessment for the management of at risk patients.