DIFFERENTIATING ACUTE MYOCARDITIS FROM ACUTE MYOCARDIAL INFARCTION: DIAGNOSTIC VALUE OF LV DEFORMATION BY 2-D SPECKLE TRACKING ECHOCARDIOGRAPHY

ACC Poster Contributions
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Background: The diagnosis of acute myocarditis is challenging since it can mimic acute myocardial infarction (AMI). Strain (S) or strain rate (SR), measured by 2-D speckle tracking echocardiogram is a new method to evaluate left ventricular (LV) mechanics. Our aim is to use S or SR to differentiate acute myocarditis from AMI in patients with preserved LV ejection fraction (EF ≥ 50% by 2-D echocardiogram (echo)).

Methods & Results: Eighteen patients (15 males) with suspected acute myocarditis, defined as acute symptoms and evidence of myocardial damage by biomarkers or cardiac structural defect by an imaging study in the absence of active coronary ischemia, were compared to 19 patients (13 males) with AMI documented by the triad of symptoms, ECG changes and biomarker elevation and with coronary angiography demonstrating a culprit lesion. Exclusion criteria: previous heart surgery, significant valvular disease or arrhythmias. Standard 2-D echo (short-axis of mid-LV and 3 apical views) at presentation was analyzed off-line for global peak longitudinal, radial and circumferential S and SR (LS, LSR, RS, RSR, CS and CSR) via Syngo Velocity Vector image software (Siemens Medical Solutions, Malvern, PA). In univariate analyses, only age (36 ± 14 vs 57 ± 6 yrs) (p < 0.05) was significantly different between the myocarditis and AMI groups. Other 2-D echo variables including EF, stroke volume index and wall motion score index were similar. For S or SR, only CS (-16.9 ± 4.6 vs -22.2 ± 5.7%), CSR (-1.1 ± 0.3 vs -1.3 ± 0.4 S-1), RS (31.6 ± 14.6 vs 44.8 ± 13.3%) were different (p< 0.05) but neither LS (-14.4 ± 3.1 vs -14.4 ± 1.9%), LSR (-0.8 ± 0.2 vs -0.8 ± 0.1 S-1) nor RSR (1.67 ± 0.6 vs 1.9 ± 0.5 S-1). CS remained significant after adjusting for age (p < 0.05). Receiver operating characteristic (ROC) curve showed AUC for CS was 0.78 (optimal cutoff value: -19.3%, sensitivity: 72%, specificity: 74%).

Conclusion: Circumferential strain derived by 2-D speckle tracking echocardiogram appears promising to differentiate acute myocarditis from AMI in patients with preserved EF.