CORONARY WAVE INTENSITY: A NOVEL INVASIVE TOOL FOR PREDICTING MYOCARDIAL VIABILITY FOLLOWING ACUTE CORONARY SYNDROMES

ACC Moderated Poster Contributions
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Introduction: Wave intensity analysis (WIA) uses simultaneous changes in intracoronary pressure and flow to characterize coronary circulatory energy. In normal hearts, flow is mainly due to microvascular, diastolic backward expansion (BEW) and aortic, systolic forward compression (FCW) waves (Fig 1a). Regional changes in contraction and microvascular function following myocardial infarction (MI) may affect these waves; the utility of WIA following MI is unknown.

Methods: Patients were included 2-7 days post-NSTEMI; excluding prior MI or hemodynamic instability. Left ventricular (LV) function and delayed enhancement were assessed by cardiac MRI. Pressure-Doppler measurements were taken in the culprit artery and a remote vessel, with adenosine-induced hyperemia. Blinded WIA was performed offline. LV recovery was quantified by MRI 3-months after PCI (Fig 1b).

Results: 18 patients (57±11 yrs) 88±51 hrs were enrolled. 12-hr TnT, % LV function and % LV infarct mass were 1.53±1.4 μg/L, 56±11 and 8.9±6 respectively. BEW (-3.17) and FCW (+2.80) predominated (W m-2 s-2x105). Culprit BEW energy strongly correlated with regional LV recovery (R2=0.53 p=0.005) and inversely correlated to infarct mass (R2 = 0.63 p < 0.0001) (Fig 1 c/d). Remote BEW correlated weakly with infarct mass (R2=0.34 p=0.03).

Conclusion: BEW energy correlates with magnitude and location of infarction and is predictive of recovery following MI. Coronary WIA may allow adjunctive viability assessment during cardiac catheterization.