Cardiovascular magnetic resonance-derived intramyocardial hemorrhage after STEMI: Influence on long-term prognosis, adverse left ventricular remodeling and relationship with microvascular obstruction.

Abstract:
T2 weighted cardiovascular magnetic resonance (CMR) can detect intramyocardial hemorrhage (IMH) after ST-elevation myocardial infarction (STEMI). The long-term prognostic value of IMH beyond a comprehensive CMR assessment with late enhancement (LE) imaging including microvascular obstruction (MVO) is unclear. The value of CMR-derived IMH for predicting major adverse cardiac events (MACE) and adverse cardiac remodeling after STEMI and its relationship with MVO was analyzed. CMR including LE and T2 sequences was performed in 304 patients 1 week after STEMI. Adverse remodeling was defined as dilated left ventricular end-systolic volume indexes (dLVESV) at 6 months CMR. During a median follow-up of 140 weeks, 47 MACE (10 cardiac deaths, 16 myocardial infarctions, 21 heart failure episodes) occurred. Predictors of MACE were ejection fraction (HR 0.95 95% CI [.93-.97], p=.001, per %) and IMH (HR 1.17 95% CI [1.03-1.33], p=.01, per segment). The extent of MVO and IMH significantly correlated (r=.951, p<.0001). dLVESV was present in
40% of patients. CMR predictors of dLVESV were: LVESV (OR 1.11 95% CI [1.07-1.15], p<.0001, per ml/m(2)), infarct size (OR 1.05 95% CI [1.01-1.09], p=.02, per %) and IMH (OR 1.54 95% CI [1.15-2.07], p=.004, per segment). Addition of T2 information did not improve the LE and cine CMR-model for predicting MACE (.744 95% CI [.659-.829] vs. .734 95% CI [.650-.818], p=.6) or dLVESV (.914 95% CI [.875-.952] vs. .913 95% CI [.875-.952], p=.9). IMH after STEMI predicts MACE and adverse remodeling. Nevertheless, with a strong interrelation with MVO, the addition of T2 imaging does not improve the predictive value of LE-CMR.