Imaging

INFARCT TISSUE HETEROGENEITY BY CONTRAST-ENHANCED MRI IS A NOVEL PREDICTOR OF MORTALITY IN PATIENTS WITH CHRONIC CORONARY ARTERY DISEASE AND LEFT VENTRICULAR DYSFUNCTION

Oral Contributions
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Background: Primary prevention of sudden cardiac death (SCD) from coronary artery disease (CAD) focuses on patients with severely reduced left ventricular function although most SCD occurs in patients with only mild or moderate reduction of LV ejection fraction (LVEF). In a consecutive patient cohort with CAD and varying degrees of LV dysfunction, we hypothesized that infarct heterogeneity by cardiac magnetic resonance (CMR) was associated with patient mortality incremental to LVEF. We further examined the strength of this association in CAD patients with LVEF>35%.

Methods: We studied 301 consecutive patients with CAD and LV global dysfunction referred for CMR myocardial viability and/or ischemia assessment. A semi-automatic algorithm quantified the total infarct mass, infarct core mass, and the peri-infarct zone (PIZ) mass using signal-intensity criteria of >2SDs, >3SDs, and 2-to-3SDs above the remote myocardium, respectively.

Results: The mean LVEF was 41 +/- 14%. After a median follow-up of 3.9 years, there were 66 deaths (13 confirmed SCD), with 33 deaths occurring in patients with LVEF>35%. Ventricular tachyarrhythmia necessitating defibrillation occurred in 22 patients. %PIZ was the strongest multivariable predictor of all-cause mortality in the whole cohort and in patients with LVEF>35% (unadjusted LRχ2 15.40 and 13.45, p<0.0001 and 0.0002, respectively). In the whole cohort, adjusted for other covariates in the best overall model, every 10% of %PIZ corresponded to a 25% increase in mortality hazard (p=0.0006). Adjusted for known markers of post-MI mortality, every 10% increase in %PIZ corresponded to a 21% increase in mortality (p=0.004). Finally, in patients with LVEF>35%, %PIZ was the only multivariable covariate selected in the best overall model, with every 10% increase in %PIZ corresponding to a 35% increase in the mortality hazard (p=0.0002).

Conclusion: In this consecutive CAD cohort, infarct heterogeneity assessed by CMR demonstrated robust association with patient mortality incremental to LVEF. The diagnostic impact of CMR infarct heterogeneity should be investigated in prospective therapeutic trials in patients with chronic CAD.