Grayzone myocardial fibrosis and ventricular arrhythmias in patients with a left ventricular ejection fraction greater than 35%

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BACKGROUND Clinical guidelines adopt LVEF cut-offs <30 or <35% as an indication for implantable cardioverter defibrillator (ICD) therapy. Most patients succumbing to sudden cardiac death (SCD), however, have a LVEF≥35%.

OBJECTIVES To determine whether myocardial fibrosis (MF) and grayzone fibrosis (GZF) on cardiovascular magnetic resonance (CMR) is associated with ventricular arrhythmias in patients with coronary artery disease (CAD) and a LVEF≥35%.

METHODS In this retrospective study of CAD patients, GZF mass using the 3SD method (GZF3SD) and total fibrosis mass using the 2SD method (TF2SD) on CMR were assessed in relation to the primary, combined endpoint of SCD, ventricular tachycardia, ventricular fibrillation or resuscitated cardiac arrest.

RESULTS Among 701 patients (age: 65.8 ± 12.3 yrs [mean ± SD]), 28 (3.99%) patients met the primary endpoint over 5.91 years (median; interquartile range 4.42-7.64). In competing risks analysis, a GZF3SD mass ≥ 5.0 g was strongly associated with the primary endpoint (subdistribution hazard ratio [sHR]: 17.4 [95% CI 6.64-45.5]); area under receiver operator characteristic curve [AUC]: 0.85, p < 0.001). A weaker association was observed for TF2SD mass ≥ 23 g (HR: 10.4 [95% CI 4.22-25.8]; AUC: 0.80, p < 0.001). The range of sHRs for GZF3SD mass (1 to 526.6) was wider than for TF2SD mass (1 to 37.6).

CONCLUSIONS In CAD patients with a LVEF≥35%, GZF3SD mass was strongly associated with the arrhythmic endpoint. These findings hold promise for its use in identifying patients with CAD and a LVEF≥35% at risk of arrhythmic events.

Abstract Figure.