Imaging of Cardiac Morphology, Dimensions, Volume and Mass

# Hypertrophic cardiomyopathy: CMR to predict dysrhythmic events

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**Introduction:** In hypertrophic cardiomyopathy (HCM), there is a significant contribute of dysrhythmic events (DE) for the burden of morbidity and mortality of the disease. The aim of this study is to assess the arrhythmic profile of HCM patients (pts) and predictors of DE.

**Methods:** Retrospective single-center study of consecutive pts with HCM defined by wall thickness ≥15 mm in ≥1 LV myocardial segments in CMR; pts with history of uncontrolled hypertension (HTN) and significant valvular disease were excluded. Demographic, clinical, CMR data and outcomes were analyzed. For statistical analysis, chi-square and Mann-Whitney tests were used, with prediction of DE (atrial fibrillation (AF); ventricular tachycardia (VT)) and implantation of cardioverter defibrillator (ICD)) with binary logistic regression model.

**Results:** We included 36 pts, aged 62.5 year-old (IQR: 49,5-74,8), 64% male. 69% had controlled HTN, 46% dyslipidemia and 23% diabetes; family history (FH) of sudden cardiac death and HCM occurred in 16% and 46%, respectively. 9% presented with syncope, 21% with palpitations and 12% with angina. Previous history of AF was present in 12% pts. 42% pts had genetic study and mutations were identified in 25% (TNNT2: 8,3%; MYBPC3:5.6%). All were in sinus rhythm at baseline. On ECG, intraventricular disturbance conduction was found in 33% and T wave inversion in 39%.

On CMR, most pts had septal wall hypertrophy(81%), while 11% had apical, 3% anterior-wall and 6% lateral-wall. SAM was present in 28% and LVOTO in 33%. 69% of the pts had LGE (midwall: 61%, subendocardial: 11%, subepicardial: 3%, at hypertrophic segments: 47%, RV/LV insertion points: 25%, other: 19.4%).

During a mean follow-up of 496 ± 338 days, new onset of AF was found in 26%, VT episodes in 20%, ICD implantation in 29% and 3% died.

There were no associations of clinical data and AF. In univariate analysis, SAM (OR 5.25, CI95% 1.02-26.9, p = 0.047), LVOTO (OR 6.7, CI95% 1.27-35.0, p = 0.025), distribution of LGE on other segments than RV/LV insertion points (OR 9.6, CI95% 1.36-67.6, p = 0.023) and absence of T-wave inversion (OR 0.17, CI95% 0.033-0.937, p = 0.042), predicted AF. The absence of T-wave inversion was the only independent predictor of AF in our population (OR 0.073, CI95% 0.006-0.949, p = 0.045).There were no independent predictors of ventricular arrythmias.

Also, we found that AF predicted VT (OR 6.13, CI95% 1.032-36.45, p = 0.046) in univariate analysis and was an independent predictor for ICD (OR 9.6, CI95% 1.26-67.59, p = 0.023). AF was a predictor of composite outcome (death, heart failure and thromboembolic events) in our population (OR 6.3 CI95% 1.3-31.1, p = 0.024).

**Conclusion:** In our population, T-wave changes, SAM, LVOTO and LGE distribution were predictors of AF, which was an independent predictor for ICD implantation. No predictors for ventricular arrhythmias were found. Larger studies taking into account echo and CMR data should be conducted to confirm these findings.