

($r=0.296$, $p=0.023$), LVMI ($r=0.290$, $p=0.026$) and MWT ($r=0.334$, $p=0.012$). There was no correlation between sST2 and LGE. No correlation was found between Gal-3 levels and CMR-derived parameters. We confirmed positive correlations between NT-proBNP levels and LVM ($r=0.328$, $p=0.0098$), LVMI ($r=0.413$, $p=0.001$), MWT ($r=0.438$, $p=0.0004$) and LAA ($r=0.483$, $p=0.0001$). NT-proBNP levels were positively correlated with mass of LGE ($r=0.329$, $p=0.011$) and with LGE extent ($r=0.295$, $p=0.023$). There were positive correlations between hs-cTnT levels and LVM ($r=0.555$, $p<0.0001$), LVMI ($r=0.518$, $p<0.00001$), MWT ($r=0.337$, $p=0.008$), LAA ($r=0.478$, $p=0.0001$) and negative correlation between hs-cTnT levels and LVEF ($r=-0.355$, $p=0.005$). Levels of hs-cTnT were also positively correlated with the mass of LGE ($r=0.408$, $p=0.0013$), and with LGE extent ($r=0.274$, $p=0.036$).

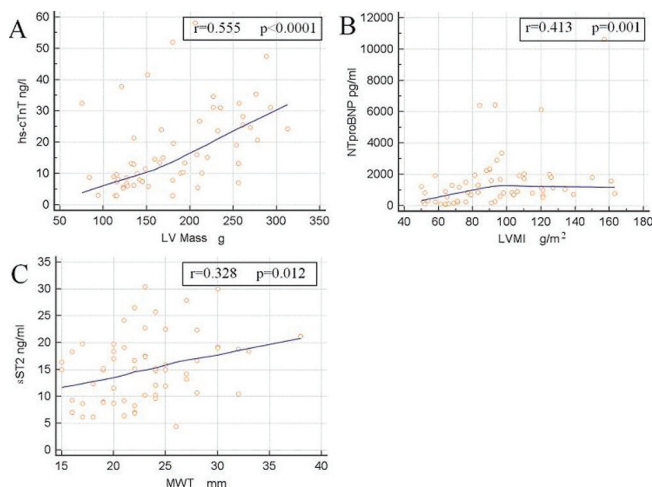


Figure 1

Conclusions: Results of this study, based on quantitative method of LGE evaluation, confirmed that NT-proBNP and hs-cTnT are valuable biomarkers in HCM and are useful in myocardial fibrosis assessment. There were no correlations between Gal-3 levels and CMR-derived parameters. Although, no correlation between sST2 levels and LGE was found, we demonstrated significant correlations between serum sST2 levels and LVM, LVMI and MWT assessed by CMR. These findings also suggest that sST2 may be useful as an additional biomarker of hypertrophy extension in patients with HCM.

Figure 1. Correlations between (A) hs-cTnT and LV mass, (B) NT-proBNP and LVMI and (C) sST2 and MWT in HCM patients

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Incremental value of CMR-derived mitral annular plane systolic excursion for atrial fibrillation risk stratification in patients with hypertrophic cardiomyopathy

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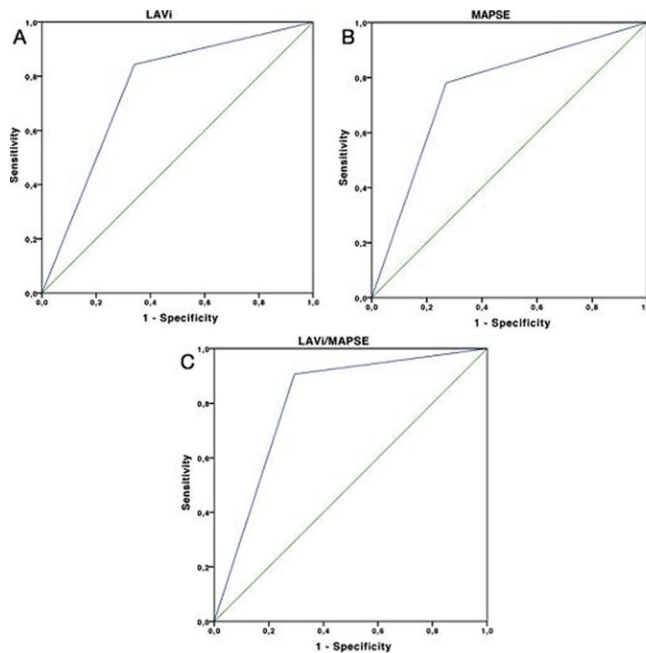
Background: Atrial fibrillation (AF) is the most common sustained arrhythmia in hypertrophic cardiomyopathy (HCM) and is associated with major adverse cardiovascular events. Novel predictors of AF to improve patients' risk stratification are necessary to identify patients at high risk who require frequent monitoring and early anticoagulation therapy. Cardiac magnetic resonance (CMR) imaging, with its tissue characterisation properties and increased spatial resolution compared to echocardiography, can aid in HCM diagnosis, prognosis, and identification of novel at-risk subgroups.

Purpose: To identify predictors of AF in HCM patients using CMR.

Methods: Patients with a diagnosis of HCM (n=218) were retrospectively identified in our CMR registry (January 2014-September 2016). The diagnosis of HCM was based on current guidelines. The CMR protocol included cine and late gadolinium enhancement (LGE) imaging. Clinical notes were evaluated to identify a documented episode of AF. CMR predictors of AF were evaluated with logistic regression analysis. Receiver operating characteristic (ROC) curves were used to determine the diagnostic accuracy of the identified CMR predictors of AF, and cut-off values with optimal sensitivity and specificity were calculated using Youden index.

Results: Median age was 59±13 years, 51% of the patients were male and 15% had a documented episode of AF (n=32). Risk of AF was associated with larger left atrial volume index (LAVi) (OR=1.052, CI=1.031-1.074; $p<0.001$) and inversely correlated with mitral annular plane systolic excursion (MAPSE) (OR=0.550, CI=0.443-0.684; $p<0.001$). A combined ratio of LAVi/MAPSE was an even stronger predictor of AF (OR=1.647, CI=1.399-1.938; $p<0.0001$). Conversely, there was no association between the risk of AF and left ventricular

(LV) ejection fraction ($p=0.288$), LV mass index (0.068), maximum wall thickness (0.557), LV end-diastolic volume (0.245), LV stroke volume (0.994), and presence/absence of LGE ($p=0.326$) or semi-quantitative LGE ($p=0.682$). The area under the ROC curve for LAVi (cut-off 53 ml/m²) was 0.75 (0.66-0.83; sensitivity=84% and specificity=66% - Figure 1A) and for MAPSE (cut-off 9.7 mm) was also 0.75 (0.66-0.85; sensitivity=78% and specificity=73% - Figure 1B). The area under the ROC curve for the LAVi/MAPSE ratio (cutoff=5.0) was 0.80 (0.73-0.88; sensitivity=91% and specificity=71% - Figure 1C).



ROC curves

Conclusion: CMR assessment of MAPSE holds promise to aid in refining risk assessment of atrial fibrillation in HCM patients. Combining structural and functional information in a simple ratio (LAVi/MAPSE) may represent a novel risk stratification tool with incremental predictive accuracy compared to atrial sizing alone.

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Prognostic value of cardiovascular magnetic resonance in the prediction of atrial fibrillation in hypertrophic cardiomyopathy (HCM)

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Background: Clinical deterioration in hypertrophic cardiomyopathy (HCM) is difficult to predict. Patients who develop atrial fibrillation (AF) are at high risk of heart failure and stroke. However, prediction of AF in HCM is challenging. We used cardiovascular magnetic resonance (CMR) to assess predictors of AF in HCM.

Purpose: To assess the prognostic value of CMR examination in the prediction of AF in HCM.

Methods: Serial patients referred for CMR assessment with a previous or subsequent diagnosis of HCM were prospectively enrolled between 2003 and 2013. Patients with previous AF were excluded. CMR examination including measurement of left ventricular volumes, percentage of late gadolinium enhancement (%LGE) and left atrial volumes (LAVi) using biplane area measurement were performed by operators blinded to clinical details. All measurements were indexed to body surface area.

Detailed medical records were obtained every 6 months from primary and secondary care and assessed by experienced medical personnel for documentation of new AF.

Results: Three hundred and sixty-six patients were recruited with a mean follow-up period of 3.4±2.1 years. Seventeen patients (4.6%) had a diagnosis of AF at baseline and were excluded. Thirty-seven (10.1%) patients developed AF during follow-up. Univariable predictors of AF are shown in Table 1. On multivariable analysis, only %LGE, LAVi and female sex were independent predictors of AF (Table 1).

%LGE had a HR per 10% of 1.37 (95% CI: 1.09-1.73; $p=0.01$), LAVi had a HR per 10mL/m² of 1.20 (1.04-1.38; $p=0.01$) and female sex had a HR of 2.33 (1.21-4.50; $p=0.01$). Patients with LGE% 40% and LAVi 100mL/m² had an estimated nine-fold increased risk of AF at 5 years compared to those with minimal %LGE (5%) and small LA volume (40mL/m²).