Journal of Cardiovascular Magnetic Resonance

BioMed Central

Meeting abstract

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200 Cardiac magnetic resonance implicates that amyloidosis, hypertension induced left ventricular hypertrophy, hypertrophic obstructive and hypertrophic non obstructive cardiomyopathy share the same pattern of non concentric left ventricular remodelling

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from 11th Annual SCMR Scientific Sessions
Los Angeles, CA, USA. 1–3 February 2008

Published: 22 October 2008

Journal of Cardiovascular Magnetic Resonance 2008, **10**(Suppl 1):A61 doi:10.1186/1532-429X-10-S1-A61

This abstract is available from: http://jcmr-online.com/content/10/S1/A61

Introduction

Abnormal left ventricular (LV) geometry and increased LV mass have proved to be independent predictors of cardiovascular outcome while their prognostic relevance has shown to differ substantially between symmetric and asymmetric geometric patterns. Cardiac magnetic resonance (CMR) provides the opportunity to exactly measure specified segments of the left ventricle with unprecedented spatial resolution.

Purpose

The aim of the present study was to elucidate if the concept of concentric and eccentric LV hypertrophy holds true in the light of current CMR imaging techniques.

Methods

We prospectively investigated a total of 59 patients with different patterns of alternated LV geometry whereas 15 healthy volunteers served as controls. Using a vector-ECG gated short axis (SA) multislice cine SSFP sequences (balanced FFE; TR/TE = 2.9/1.45 ms; acquired Voxel-size = 2.38*2.46*8; SENSE-Factor = 2; flip angle = 60°) planned on true cine SSFP two- and four-chamber views, LV mass (g) was assessed. LV myocardium was subdivided in 16 segments. In analogy to echocardiographic methods, where basal LV wall thickness together with LV end diastolic diameter are used to define LV geometry, mean values of end diastolic wall thickness of the basal 2 lateral and the basal 2 septal segments were compared using one-way ANOVA with Bonferoni's adjustment for multiple comparisons. Individual segments were compared respectively, as well as segments in the mid ventricular plane. All measurements were performed on a 1.5 T MRI scanner (ACHIEVA, Phillips Medical Systems, Netherlands).

Results

LV mass was similar in all patient groups (162 ± 50 g; p = NS) but significantly higher compared to controls (91 ± 20 g; $p < 0.001$). Mean wall thickness of basal lateral segments was significantly lower compared to septal segments in all patient groups (see Table 1). This held true if individual segments were compared (p-values not shown). Evaluation of mid ventricular segments showed comparable results, except for patients with hypertrophic obstructive cardiomyopathy (p = NS).

Conclusion

Current CMR techniques allow a highly accurate measurement of LV mass and specific LV wall segments. Our data suggest that direct comparison of LV wall thickness in these segments can rule out the existence of the commonly accepted idea of a symmetric remodelling pattern

Table 1: CMR data suggest that direct comparison of LV wall thickness can rule out the existence of the commonly accepted idea of a symmetric remodelling pattern in patients with LV hypertrophy

Segments	Amyloidosis	HNCM	HOCM	HLVH
basal lateral vs. basal septal	ΔWT = 4 ± 0.8 mm p < 0.001	ΔWT = 5.6 ± 1.5 mm p < 0.004	ΔWT = 5.5 ± 1.5 mm p < 0.002	ΔWT = 4,5 ± 0.9 mm p < 0.001
midventr. lateral vs. midventr. septal	ΔWT = 2.6 ± 0.9 mm p < 0.01	ΔWT = 6.5 ± 1.5 mm p < 0.001	ΔWT = 2.6 ± 1.5 mm p = NS	ΔWT = 3 ± 0.9 mm p < 0.004

ΔWT = Difference in LV wall thickness between compared segments; HNCM = Hypertrophic Non Obstructive Cardiomyopathy; HOCM = Hypertrophic Obstructive Cardiomyopathy; HLVH = Hypertension Induced Left Ventricular Hypertrophy.

in patients with LV hypertrophy. Given the prognostic implications attributed to the concept of eccentric and concentric remodelling, re-evaluation of these concepts using CMR as a reference might be considered