Comparison between echocardiography and cardiac magnetic resonance for differential diagnosis of left ventricular hypertrophy

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Background: Left ventricular hypertrophy (LVH) may be due to different causes, ranging from, benign secondary forms (athlete's heart) to severe prognosis cardiomyopathies (i.e. cardiac amyloidosis). Early and accurate differential diagnosis is important to proper patient management. LVH may be detected by echocardiography signs of hypertrophy or other abnormalities often associated to hypertrophic phenotypes. Cardiac magnetic resonance (CMR) is often used to confirm the initial diagnostic suspicion. On the best of our knowledge, there are no study specifically designed to evaluate the final impact of CMR in changing or confirming the initial diagnostic echocardiographic suspicion.

Aim: To evaluate the clinical prognostic correlates of CMR in patients with echocardiographic or ECG suspicion of LVH (or cardiomyopathies with hypertrophic phenotype).

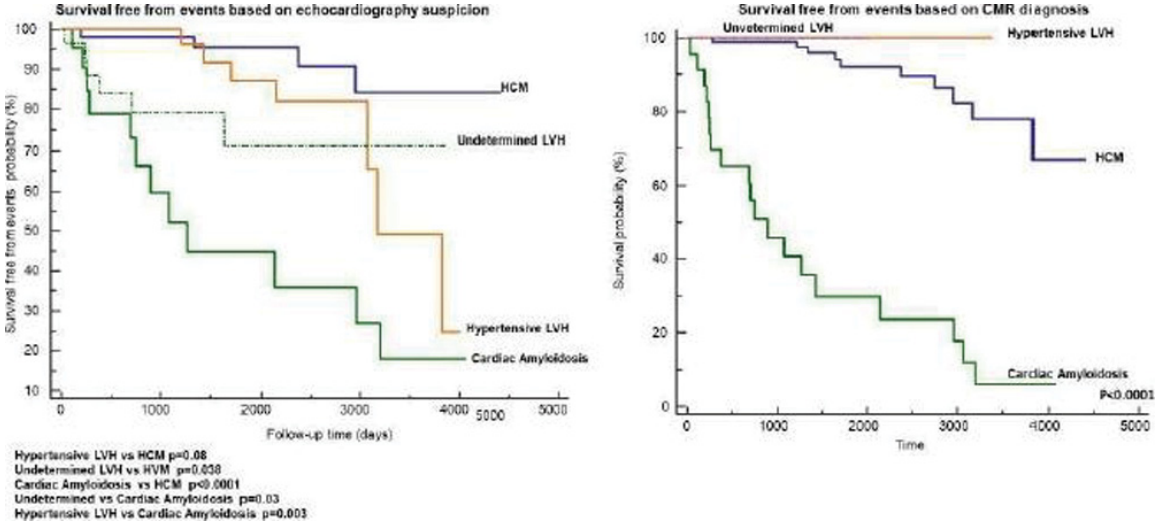
Methods and results: We enrolled 275 pts with echocardiographic evidence of LVH. Using current guidelines, the initial echocardiographic diagnostic suspicion was: hypertrophic cardiomyopathy (HCM) in 46.9% of pts; cardiac amyloidosis in 14.5%; hypertensive LVH in 17%; aortic stenosis in 1.5%; athlete's heart in 0.3%; undetermined LVH in 17%. CMR changed the diagnosis in 42% cases: the diagnosis of HCM increased from 44% to 72% of pts; hypertensive and undetermined LVH decreased significantly (respectively to 4% and 5%). Finally, the change in diagnostic suspicion was associated to reclassification of risk of patients: Kaplan-Meier curves demonstrated that HCM and cardiac amyloidosis had worst prognosis than undetermined or hypertensive LVH.

Conclusions: CMR changed the echocardiographic suspicion in almost half of patients with LVH. This study highlights the indication of CMR in patient with ECG or echocardiographic suspicion of LVH.

Echo suspicion vs CMR diagnosis

Suspicion at echocardiography	Final diagnosis at CMR*						
	HCM	Amyloidosis	Hypertensive LVH	Athlete's heart	Aortic stenosis	Undetermined LVH	
HCM	124 (96%)	2	2	0	0	1	129 (46.9%)
Amyloidosis	9	23 (57%)	2	2	0	4	40 (14.5%)
Hypertensive LVH	36	3	8 (17%)	0	0	0	47 (17.0%)
Athlete's heart	0	0	0	1 (100%)	0	0	1 (0.3%)
Aortic stenosis	1	0	0	0	3 (75%)	0	4 (1.5%)
Undetermined LVH	28	7	0	2	0	9 (19%)	46 (17.0%)
	198 (72%)	35 (12.7%)	12 (4.4%)	5 (1.8%)	3 (1.0%)	14 (5.0%)	267*

*Others diagnosis were made by CMR in 3 pts (1%): 1 ARVD, 1 ischemic heart disease, 1 with no LVH but non ischemic LGE. In 5 pts (1.8%) CMR found no LVH.



Kaplan-Meier curves