T1 native as a marker for differentiation of the left ventricular hypertrophy phenotypes of hypertrophic cardiomyopathy and hypertensive cardiomyopathy.

Rocio Hinojar, MD; Niharika Varma, MD, Ben Goodman, BSc; Sitara Khan, MD; Eduardo Arroyo Ucar, MD; Darius Dabir, MD; Tobias Schaeffter, PhD; Eike Nagel, MD, PhD; Valentina O. Puntmann, MD, PhD

Cardiovascular Imaging Department, King's College London, London, UK

INTRODUCTION AND BACKGROUND:

The differential diagnosis of hypertrophic phenotype remains challenging in clinical practice, in particular between hypertrophy cardiomyopathy (HCM) and increased left ventricular wall thickness (LVWT) due to systemic hypertension (SH).

Diffuse myocardial fibrosis is the characteristic feature in HCM, whereas hypertensive response is underpinned by addition of myofibrils in otherwise normal myocardial tissue.

Late gadolinium enhancement (LGE) imaging provided important new way of differentiation between these two entities by separating those cases with evidence of regional fibrosis. Whereas approximately 60% of patients with HCM reveal visually discernable LGE, **T1 mapping** is highly discriminative, irrespective of the presence of LGE.

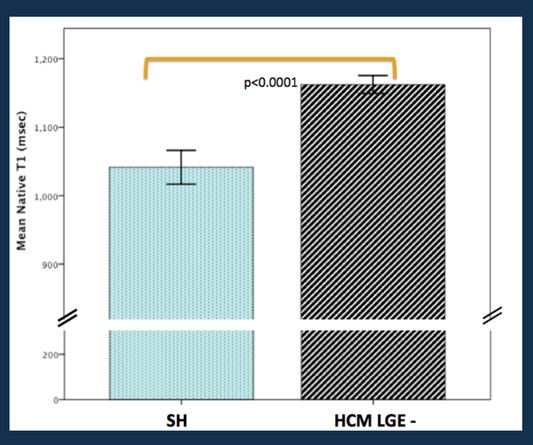
METHODS :

Seventy-nine patients with diagnosis of unequivocally HCM and sixty patients with SH underwent routine cardiac MRI protocol including assessment of function and scar in addition to T1 mapping (3-Tesla).

T1 values were measured conservatively within septal myocardium in midventricular short-axis slice prior to administration of 0.2 mmol/kg of gadobutrol.

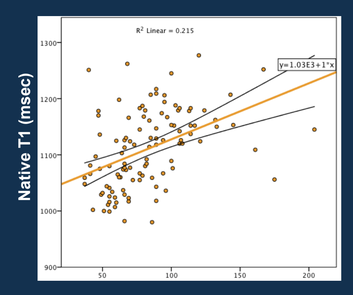
RESULTS:

- HCM group showed higher LV mass and maximum LVWT than the SH group (HCM vs. SH: LVmass, g/m2: 98.1± 33.6 vs. 67.2±22.6; maximum LVWT 19.0±3.9 vs. 13.2±1.3, p<0.0001)
- LGE was present in 20% (n=10, 4 with an ischaemic pattern) of the SH group and in 82% (n=48, 2 with an ischaemic pattern (p<0.001) of the HCM group)
- Patients with HCM showed higher T1 values compared to SH patients (HCM vs. SH, msec: 1163±46 vs. 1049±31, <0.0001).

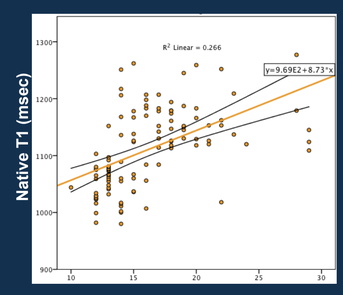


Patients with HCM without areas of LGE showed higher T1 values compared to SH

- Native T1 values were concordant to LVWT and LV mass

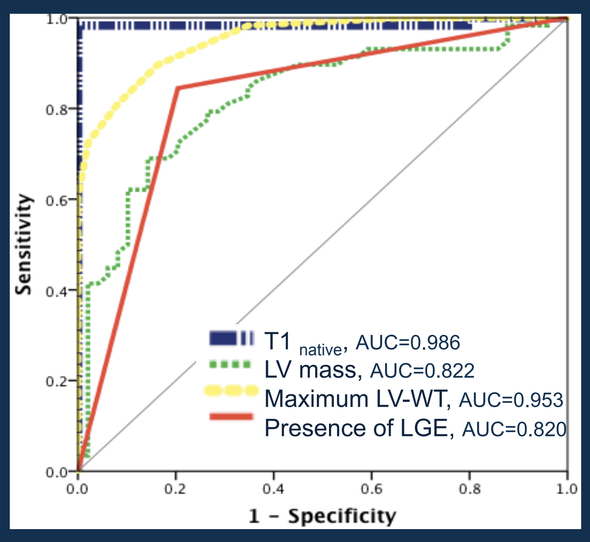


LV mass index



Maximum LV thickness

- Native T1 was identified as an independent discriminator between the two conditions



Native T1 held superior diagnostic accuracy compared to conventional functional parameters and the presence of LGE to discriminate between HCM or SH

CONCLUSION: We demonstrate that native T1 values can reliably discriminate between hypertrophic and hypertensive cardiomyopathy. Given its novelty and ease-of-use nature, T1 native has the immediate potential of clinical translation as a diagnostic marker between these two conditions.

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