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The clinical value of the ultrasound, MRI and native T1 for the differentiation of left ventricular hypertrophy

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Objectives: The differential diagnosis of left ventricular (LV) hypertrophy remains challenging in clinical practice. As well as, T1 measurements have been validated against histological measures of myocardial collagen content in patients with HCM. To evaluate the capability of ultrasound, MRI and MRI+Native T1 to differentiate hypertrophic cardiomyopathy (HCM), and hypertensive heart disease (HHD), which are important etiologies of left ventricular hypertrophy (LVH), expected to provide a reference for the clinical diagnosis of LVH.

Materials & Methods: 14 HCM patients (60 ± 8 years), HHD patients (40 ± 14 years), and 15 healthy controls (41 ± 19 years), were enrolled between 2016-6-1 and 2017-10-12. All patients underwent ultrasound, CMR and measuring Native T1. Native T1 focus on interventricular septum was compared among the three groups. A compared result of the detection with ultrasound, MRI and MRI+Native T1 between the results of clinical diagnostic, is to investigate the diagnostic ability of different image means for HCM and HHD. Descriptive analysis and comparisons of the groups have been performed using standard approaches. All tests were 2-tailed and a P value of <0.05 was considered significant.

Results: Compared to controls, Native T1 was increased in patients with HCM (Native T1 = 1264.15 ± 6.99 , 1296.56 ± 11.85 in controls, HCM, respectively, $P=0.018$). There were no significant for between HHD and controls ($p>0.05$). The sensitivity, accuracy of MRI+Native T1 (92.8%) for LVH was better than ultrasound (64.3%) and MRI (85.7%), but the specificity was similar with ultrasound and MRI.

Conclusions: The MRI+Native T1 can be as the preferred means for the differentiation of LVH. The MRI+Native T1 may serve as a clinically robust biomarker to make a definitive diagnosis when the transthoracic echocardiogram diagnosis is not clear-cut.

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