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Diffuse myocardial fibrosis, but not focal fibrosis identified with delayed enhancement, is an independent predictor of LV reversed remodeling in patients with idiopathic non-ischemic cardiomyopathy

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Background

Diffuse myocardial fibrosis may be a fundamental features of adverse myocardial remodeling in idiopathic non-ischemiccardiomyopathy. As T1-weighted cardiac magnetic resonance (CMR) imaging provides an alternative method of diffuse fibrosis quantification, we sought to assess the association of myocardial T1 value to left ventricular reverse remodeling (LVRR).

Methods

We performed CMR in 24 patients with idiopathic non-ischemic cardiomyopathy (16 men, mean age 58±11 years) and also in 12 healthy volunteers as control subjects. T1 mapping was performed with post-contrast Look-Locker gradient echo. Baseline echocardiography as well as hemodynamic and metabolic data were collected at the time of CMR. Patients were followed over a median time of 8 months for LVRR which was defined as a left ventricular ejection fraction (LVEF) increase of ≥10 U and a decrease in indexed left ventricular end-diastolic diameter (LVEDD) of ≥10% or indexed LVEDD of < 33 mm/m^2 at 24 months. A multivariable logistic regression analysis was performed to identify associations with LVRR.

Results

LVRR was found in 8 patients (33%). Mean T1 value was substantially lower in patients without LVRR (240+26) compared to patients with LVRR (285+35, p=0.002) and healthy controls (413+57, p<0.001) (Figure1). There was no significant difference in T1 value of the non delayed-enhanced myocardium in patients with myocardial scar on delayed-enhancement imaging (264+26) and without scar (263+42, p=0.233). LVRR was associated with baseline T1 value (HR 1.1 [95% CI 1.01-1.19]), independent of LVEF and the presence of myocardial scar on delayed-enhancement imaging (Table 1).

Conclusions

Post contrast T1 value is a predictor of LV reversed remodeling in patients with idiopathic non-ischemic cardiomyopathy, independent of baseline LVEF and the presence of myocardial scar.

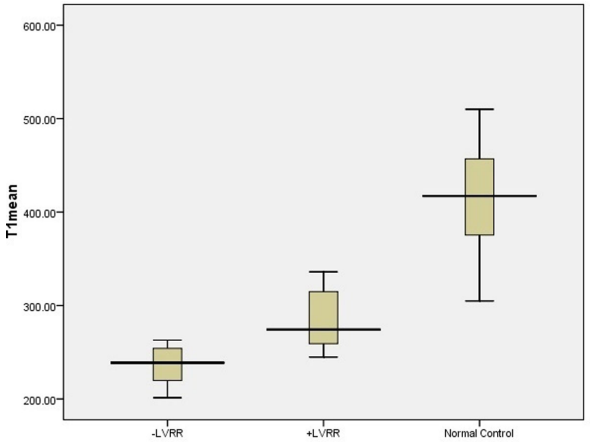

Figure 1 Comparison of myocardial T1 time between patients without LVRR, patients with LVRR and controls.

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Table 1 Multivariate analysis of baseline correlates of LVRR

Variables	HR (95%CI)	P value
Baseline LVEF	0.804 (0.643-1.004)	0.054
Presence of myocardial scar	1.552 (0.091- 26.57)	0.762
Myocardial T1 time	1.098 (1.012-1.192)	0.025

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