

MODERATED POSTER PRESENTATION

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Diffuse myocardial fibrosis by post-contrast T1-time predicts outcome in heart failure with preserved ejection fraction

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Background

Diffuse myocardial fibrosis plays a key role in disease progression of heart failure with preserved ejection fraction (HFPEF). Recently it was shown that diffuse myocardial fibrosis is strongly related to post-contrast longitudinal relaxation (T1) time by cardiac magnetic resonance imaging (CMR). The aim of our study was to assess diffuse myocardial fibrosis by CMR T1-mapping in HFPEF patients and test its predictive value.

Methods

HFPEF was defined as serum NT-proBNP levels > 220 pg/ml, E/e by echocardiography ≥ 8 , signs or symptoms of heart failure and preserved left ventricular ejection fraction ($EF \geq 50\%$).

63 HFPEF patients and 37 controls were prospectively evaluated. All patients underwent right heart catheterization. CMR studies included the assessment of cardiac function and dimensions by standard cine sequences. Myocardial T1-mapping was performed 15 minutes after a gadolinium bolus using an inversion recovery sequence.

Results

Post-contrast T1 was significantly correlated with variables reflecting left ventricular filling pressure (E/e $p=0.001$, $R=-0.33$; left atrial size, $p=0.008$, $R=-0.27$) and pulmonary vascular resistance ($p=0.004$, $R=-0.36$).

Patients were followed for a median (range) of 12.9 (0.5-23.1) months. By Kaplan-Meier analysis, event-free survival was significantly worse in patients with T1-times below the median of 388.2ms (log rank $p=0.007$). By multivariable Cox regression including baseline

characteristics, invasive hemodynamics, renal function, and CMR imaging variables, only post-contrast T1 time ($p=0.015$) and left atrium area ($p=0.029$) remained independent predictors of event-free survival.

Conclusions

Our data suggest that post-contrast T1-mapping is a promising tool for the assessment of diffuse myocardial fibrosis. It is closely linked to variables reflecting impaired left ventricular relaxation and hemodynamic variables like pulmonary vascular resistance. Post-contrast T1 time in HFPEF patients outperformed invasive hemodynamics in the multivariable analysis as an independent predictor of event-free survival.

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