

POSTER PRESENTATION

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Extracellular volume fraction in dilated cardiomyopathy patients without obvious late gadolinium enhancement: comparison with healthy control subjects

Dong Jin Im^{1*}, Yoo Jin Hong¹, Chul Hwan Park², Byoung Wook Choi¹, Tae Hoon Kim²

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Background

To evaluate whether the extra-cellular volume fraction (ECV) measured using cardiac MRI can detect myocardial tissue changes in dilated cardiomyopathy (DCM) without late gadolinium enhancement (LGE).

Methods

Forty-one DCM patients and 10 healthy volunteers underwent pre- and post- T1 mapping using a modified Look-Locker inversion recovery (MOLLI) sequence, LGE, and cine MRI on a 3-T cardiac magnetic resonance (CMR) system. LGE-MR findings were used to divide DCM patients into two groups: Group A had no apparent LGE, and Group B had LGE apparent in at least one segment. The ECV of left ventricle (LV) myocardium (16 segments) was calculated in short-axis view as follows: $ECV = [(\Delta R1 \text{ of myocardium} / \Delta R1 \text{ of LV blood pool})] \times (1 - \text{hematocrit})$, where $R1 = 1/T1$, $\Delta R1 = \text{Post-contrast } R1 - \text{Pre-contrast } R1$. The LV ejection fraction (LVEF) was obtained from cine MRI images. The mean myocardial ECV in LGE (-) segments in Group A+B was compared to that of controls. The mean myocardial ECV in Group A was compared to that of LGE (-) segments in Group B. The correlation between LV systolic function and the mean myocardial ECV of the whole myocardium was evaluated in all groups.

Results

Among the 41 DCM patients, 22 were in Group A, and 19 were in Group B. The mean ECV of DCM patients ($n = 41$, 568 segments, $30.7\% \pm 5.9$) was significantly higher ($p < 0.001$) than that of the control group ($n = 10$, 157 segments, $25.6\% \pm 3.2$). The ECV was inversely related to LVEF in Group A ($r = -0.551$, $p = 0.008$), Group B ($r = -0.525$, $p = 0.021$), and Group A+B ($r = -0.550$, $p < 0.001$).

Conclusions

The ECV measured by MRI could be a useful parameter in evaluating diffuse myocardial changes in DCM patients.

Authors' details

¹Department of Radiology, Research Institute of Radiological Science, Severance Hospital, Yonsei University College of Medicine, Seoul, Korea (the Republic of. ²Department of Radiology, Research Institute of Radiological Science, Gangnam Severance Hospital, Yonsei University College of Medicine, Seoul, Korea (the Republic of.

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¹Department of Radiology, Research Institute of Radiological Science, Severance Hospital, Yonsei University College of Medicine, Seoul, Korea (the Republic of

Full list of author information is available at the end of the article