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Right ventricular function differs in idiopathic dilated versus ischemic cardiomyopathy

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Introduction

Less is known about the extent and dignity of the impairment of right ventricular function in patients with highly reduced left ventricular (LV) function in dilated (DCM) versus ischemic cardiomyopathy. Magnetic resonance imaging (MRI) provides means for the exact measurement of both left and right ventricular functional parameters.

Purpose

Are there differences in right ventricular function depending on the cause of LV dysfunction?

Methods

141 patients with an indication for cardiac MRI (84% male) and a left ventricular ejection fraction of below 35% were examined with a 1.5 T Siemens Sonata. A complete exam comprised short axis volumetry and post-contrast late enhancement imaging to confirm the diagnosis. Pulmonary pressure was determined invasively or estimated by echocardiography.

Results

The underlying cause for heart failure was in 52% coronary artery disease (CAD), mean LVEF was 26 ± 6%; RVEF 50 ± 13% in this subgroup. Mean LVEDVI (end-diastolic volume index) was markedly raised (118 ± 38 ml/m^2), RVEDVI was normal (59 ± 20 ml/m^2). 34% of the patients had idiopathic DCM, mean values for LVEF/EDVI and RVEF/EDVI were 24 ± 7%; p = 0.62 und 138 ± 36 ml/m^2; p = 0.02 as well as 40 ± 13%; p < 0.01 and 77 ± 26 ml/m^2; p < 0.01 as compared to CAD patients. The remaining patients other causes for LV functional impairment (restrictive, tachymyopathy, valvular disease). In 38% of the patients with ischemic cardiomyopathy pulmonary hypertension was present. In these cases significantly higher right ventricular volumes (65 ± 20 ml/m^2 versus 54 ± 18 ml/m^2; p = 0.03) und a lower RVEF (40 ± 13% versus 55 ± 10%; p < 0.01) could be measured in comparison to patients without a normal pressure in the pulmonary artery. In Patients with DCM, no significant differences of left- and right ventricular functional parameters in dependence of pulmonary disease could be found. However, Right ventricular EF was significantly correlated to LVEF in the DCM group (r = 0.77; p < 0.01), this was not found in the CAD group.

Conclusion

Right ventricular function, an important prognostic parameter, is significantly better in patients with ischemic cardiomyopathy as compared to patients with dilated cardiomyopathy. This was not true for patients with additional pulmonary hypertension. Only in patients with dilated cardiomyopathy a significant correlation of right and left ventricular functional impairment could be found.