Myocardial fibrosis is a predictor of atrial fibrillation in dilated cardiomyopathy—role of cardiovascular magnetic resonance

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CMR Late gadolinium enhancement (LGE) has been found in about two-thirds of patients with dilated cardiomyopathy (DCM) and has been associated with ventricular arrhythmia and sudden death. The aim of this study was to assess, in patients (pts) with DCM, the relationship of LGE with the occurrence of atrial fibrillation (AF), which is a frequent complication of DCM.

Methods: 72 consecutive pts (44±11 year-old, 29 men) with DCM were included, after exclusion of ischemic heart disease (coronary angiography or CCT), secondary cardiomyopathies (clinical and laboratory investigation), non-sinus rhythm and contraindications to CMR. Functional class and plasmatic NT-proBNP were assessed. All pts underwent CMR: a) short-axis SSFP for left atrial volume and left ventricle (LV) volumes and ejection fraction (EF); b) LGE presence (segmented inversion-recovery fast gradient-echo sequence); c) Global longitudinal strain using feature tracking (Circle cvi42). Mean follow-up period was 2.8+/1.8 years. The occurrence of AF was registered from the clinical records and from annual Holter monitoring during the follow-up period.

Results: 56 pts were in NYHA class II and 16 in class III. Mean NT-proBNP was 551±380pg/ml, left atrial volume was 48.5±11.0 ml/m2, LV end-diastolic volume was 155±44mL/m2, EF was 34±8%, GLS was 16±2.1. LGE was found in 38 patients (67%) located in midwall, involving a mean of 6 segments per pt (range 3-11). During follow-up, AF episodes occurred in 31 pts. In comparison with pts without AF, pts with AF had higher NT-proBNP (836±110 vs 474±132 pg/ml, p=0.01), larger atrial volume (56.1±10.1 vs 38.2±9 ml/m2, p=0.002), larger LV end-diastolic volumes (162±31 vs 149±35ml/m2, p=0.03), lower GLS (14.9±2.1 vs 17.1±1.1) and more frequent LGE (p=0.0003). No differences were found in EF. Using multivariate analysis, the atrial size and the presence of LGE were independent predictors of AF episodes.

Conclusion: In patients with DCM, both LGE together and atrial size were independent predictors of AF, among functional class, LV volumes, GLS and NT-proBNP. These findings should be used for risk assessment and therapeutic decisions for AF prevention.