ASYNCHRONY OF CONTRACTION AND REDUCED LEFT VENTRICULAR COMPLIANCE PREDICT SHORT-TERM CLINICAL WORSENING IN TRANSPLANT CANDIDATES WITH DILATED CARDIOMYOPATHY

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Background: With increasing heart transplant (HTx) waiting times, anticipation of short-term cardiac worsening, and finding predictors of short-term outcome without HTx or a ventricular assist device (VAD) are major goals. In patients with dilated cardiomyopathy (DCM) referred for HTx, we assessed the predictive value for short-term clinical worsening of transthoracic echocardiography (TTE), exercise tolerance and NT-ProBNP levels at follow-up.

Methods: In 1/2006 - 1/2009 all DCM outpatients in stable NYHA class III with sinus rhythm and LVEF < 30% at selection for the study underwent serial TTE including 2D strain imaging, exercise testing, and plasma NT-ProBNP measurements. Parameters were tested for ability to predict further clinical course of heart failure (HF) during the first 6 months after inclusion in the study.

Results: During the first 6 months, 31 (44.3%) of 70 evaluated patients showed severe cardiac deterioration (9 died, 19 received VADs, 4 underwent HTx). Comparing the initial parameters of unstable patients with those of the 39 who remained stable, we found no differences in exercise tolerance (including VO2max) or LV enddiastolic volume or ejection fraction (21 ± 7% vs. 20 ± 6%). However, patients with subsequent clinical worsening had initially more altered transmitral flow profiles (shorter E-wave deceleration time, higher E/A ratios, shorter isovolumetric relaxation time) and higher NT-ProBNP levels (p < 0.05). Also, strain imaging revealed lower systolic strain rate (SSR), higher systolic dyssynchrony, lower late diastolic strain rate (DSRA) and higher early/late diastolic strain rate (DSRE/DSRA) ratios (p < 0.05). At certain cut-off values, the transmitral E/A ratio, the 2D strain derived dyssynchrony indexes and the DSRA showed positive and negative predictive values for short-term cardiac stability of between 83% - 89% and 85% - 90%, respectively.

Conclusions: In clinically stable HTx candidates with DCM, the transmitral flow profile and certain 2D strain imaging parameters reflecting alterations of LV compliance and regional synchrony of contraction are predictive for the short term course of HF and may therefore be valuable in guiding listing procedures for HTx.