CAN STRAIN ECHOCARDIOGRAPHY PREDICT REJECTION IN HEART TRANSPLANT RECIPIENTS WITH NORMAL EJECTION FRACTION?

Poster Contributions
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Authors: Andrew Tseng, Alfredo L. Clavell, Patricia A. Pellikka, Fletcher A. Miller, Hector R. Villarraga, Mayo Clinic, Rochester, MN, USA

Background: Rejection is prevalent in heart transplant (HTX) recipients and its diagnosis with noninvasive tools has been difficult. The aim of this study was to determine if 2-dimensional speckle tracking echocardiography (2D-STE) can be used to predict rejection in HTX recipients with normal left ventricular ejection fraction (LVEF).

Methods: We analyzed 26 patients with normal LVEF (>55%) and severe rejection by biopsy (ISHLT HTX Rejection Grade ≥2R) and 40 normal HTX controls. Transthoracic echocardiography was performed within one month of the biopsy. Global LV Longitudinal and Circumferential Strain and Strain Rates (GLS, GLSR, GCS and GCSR) were analyzed off-line.

Results: Mean age was 45 years (48% males) for patients with rejection and 55 years (75% males) in HTX controls. Demographic and echocardiography variables were similar in cases vs controls: LVEF 65% for both (p=0.70), hypertension 76% vs 82%, (p=0.71), type 2 diabetes mellitus 19% vs. 23% (p=0.88), LDL cholesterol 103 mg vs. 106 mg, (p=0.91), LV mass mean 176 mg vs. 185 mg, (p=0.83). Strain and strain rate values are shown in table 1. Only GLS and GLSR were significantly different between controls and patients with severe rejection (-13.63±0.37 vs -16.75±0.75 with p=0.0004 and -0.82±0.03 vs -1.12±0.08 with p<0.0001, respectively). Area under the curve and receiver operating characteristic calculations were GLSR 0.77, GLS 0.79. For GLS, a cutoff value off -8.11% had a sensitivity of 76% and a specificity of 88% and for GLSR, a cutoff value off -1.03 1/sec had a sensitivity of 67% and a specificity of 93% for distinguishing rejection. Using the Cox multivariate analysis after adjusting for hyperlipidemia, diabetes, hypertension, LVM, LVEF, QRS duration , the difference remained significant with an odds ratio values from 2.089 (95% CI: 1.335 - 3.591) to 6.623 (95% CI: 2.814 - 24.778) to detect a 2% difference in GLS and 0.2 difference in GLSR.

Conclusions: In HTX rejection patients with normal EF, strain and strain rate indices measured by 2D-STE can be used to detect severe transplant rejection. This new tool should be tested prospectively in patients with potential HTX rejection and normal EF.