GLOBAL LONGITUDINAL STRAIN PREDICTS POOR EXERCISE CAPACITY IN PATIENTS WITH EXERTIONAL DYSPNEA

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Background: Diastolic and latent systolic dysfunction as assessed by left ventricular myocardial mechanics may explain poor exercise capacity in patients with exertional dyspnea.

Methods: We evaluated 95 consecutive patients with exertional dyspnea referred for exercise echocardiography from August 2008 to March 2012. Patients with exercise-induced ischemia, low left ventricular ejection fraction (<50%), significant valvular abnormalities, and poor image quality were excluded. All patients exercised on the treadmill using standard or modified Bruce protocol. Poor exercise capacity was defined as <8 metabolic equivalents (METs). Standard echocardiographic measures including tissue Doppler were obtained at rest. Left ventricular global longitudinal strain (GLS) at rest was evaluated using 2D speckle tracking in standard 2-, 3-, and 4-chamber views (Syngo Velocity Vector Imaging software, Siemens).

Results: The mean age was 57 years with 39(41%) males and mean body mass index (BMI) of 31kg/m2. Thirty-eight patients(40%) had poor exercise capacity. In univariate analysis, patients with poor exercise capacity were older, more likely to be hypertensive, and had a lower GLS. There was no significant difference between the groups in terms of gender, BMI, diabetes mellitus, or measures of diastolic dysfunction. In the multivariate model, age (odds ratio (OR) 1.07, 95% CI 1.01-1.12), hypertension (OR 9.53, 95% CI 3.00-30.26), and GLS (OR 0.84, 95% CI 0.70-1.00) predicted poor exercise capacity while gender, diabetes mellitus, and grade of diastolic dysfunction did not.

Conclusions: Left ventricular GLS is a good predictor of exercise intolerance in patients with unexplained exertional dyspnea referred for exercise echocardiography.