LEFT VENTRICULAR GLOBAL LONGITUDINAL STRAIN CORRELATES TO DIASTOLIC FUNCTION AND REDUCED EXERCISE CAPACITY IN PATIENTS WITH PRESERVED EJECTION FRACTION

Oral Contributions
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Background: Exercise capacity variables such as peak oxygen uptake (peakVO2) provide robust prognostic information in heart failure patients with reduced left ventricular (LV) ejection fraction (EF) and in heart failure with preserved LVEF (HFpEF). Echocardiographic global longitudinal strain (GLS) is superior to LVEF for detection of early reduction of myocardial function. We explored the relationship between exercise capacity and myocardial systolic and diastolic function. We hypothesized that echocardiographic strain can detect reduced myocardial function in patients with reduced exercise capacity, including patients with HFpEF.

Methods: We included 100 patients with cardiovascular disease (mean age 56±12 years, NYHA class 2.3±1.1 and LVEF 42±19%). Preserved LVEF was defined as LVEF ≥55% (n=35). Systolic function was assessed by echocardiographic LVEF and by speckle tracking GLS in a 16 segments LV model. Diastolic function was assessed by early diastolic filling (E) to myocardial tissue velocity (e´) ratio. Peak VO2 was determined by cardiopulmonary exercise testing.

Results: In all patients with heart failure, LVEF, LV GLS and E/e´ correlated to peak VO2 (r=0.62, p<0.001, r= -0.63, p<0.001, r= -0.41, p<0.001, respectively). LV GLS was superior to identify patients with peak VO2 < 20 ml/kg/min compared to LVEF by receiver operating characteristic analyses (area under the curve: 0.93 vs. 0.86, p=0.03). In patients with preserved LVEF we found: 1. LV GLS and E/e´ correlated to peak VO2, while LVEF did not (R=0.50, p=0.002, R= -0.55, p=0.001 and R=0.16, p=0.37). 2. LV GLS correlated to E/e´, while LVEF did not (R=0.53, p=0.001 and R=0.03, p=0.87). 3. LV GLS (p=0.04) and E/e´ (p=0.004) were markers of symptoms (NYHA class ≥ 2) while LVEF was not (p=0.32).

Conclusions: LV GLS and diastolic parameters were able to detect LV impairment in patients with reduced exercise capacity and preserved LVEF. There was a significant relationship between systolic strain, diastolic function and symptoms of dyspnea, confirming a close systolic-diastolic coupling in HFpEF patients with symptoms of dyspnea. These findings indicate that GLS may help quantifying myocardial function in patients with HFpEF.