Abstract: P868

Peak cardiac power output-to-left ventricular mass independently predicted the risk of adverse left ventricular remodeling in patients with heart failure and reduced ejection fraction

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Background. Exercise stress echocardiography (ESE) can evaluate the contractile response of patients with heart failure (HF) through ESE-derived indexes, including left ventricle ejection fraction (LV EF), end-systolic volume (ESV) index, the end-systolic pressure-volume relation (ESPVR, i.e. LV elastance) and cardiac power output to LV mass (CPOM). Little is known whether ESE parameters may be useful to identify the risk of the ensuing LV remodeling.

Aim. We sought to test whether ESE parameters are useful to identify the risk of LV remodeling at follow-up in patients with chronic HF and reduced EF (HFrEF).

Methods. Enrolled patients underwent a symptom-limited graded bicycle semi-supine ESE. A complete echocardiographic study was carried out at baseline and at peak stress. CPOM (expressed in Watts/100 g) was calculated as the product of a constant (K=2.22×10^-1) with cardiac output (CO) and mean arterial pressure (MAP), divided by LV mass (M): CPO=K×CO×MAP/M. LV remodeling was defined as =10% increase in ESV at 6 months. We used multivariable logistic analysis to assess the risk of LV remodeling at follow-up. Patients were also followed-up for the end-point of all-cause mortality.

Results. We studied 134 patients (age: 61±11 years, 19% female) with chronic HF and LV EF<45% (median follow-up: 35 months). An increase =10% of LV ESV at 6 months exhibited the worst survival (36% vs 85%, log rank 29.6, p<0.0001). The univariate determinants of LV remodeling at logistic regression analysis were: ischemic aetiology (p=0.007), chronic kidney disease (p=0.0085), mitral regurgitation (p=0.0047), NYHA class (p=0.0046), E/e' (p=0.0023), BNP (p=0.0002), peak cardiac power output (p=0.0002), peak CO (p=0.0002), peak LV ESV (p<0.0001), peak LV EF (p<0.0001), peak ESPVR (p<0.0001), and peak COPM (p<0.0001). Peak CPOM resulted the only independent predictor of LV remodeling (p=0.03), after adjusting for demographics, clinical, biochemical, and echocardiographic data. Conclusion. Patients with HFrEF that developed LV remodeling during follow-up had the worst outcome. A compromised ESE-derived peak COPM was the most powerful predictor of LV remodeling.