Abstract: P888

Left ventricular diastolic function and left atrial longitudinal function during exercise correlate with exercise capacity in patients with hypertrophic cardiomyopathy

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Background: The clinical course of hypertrophic cardiomyopathy (HCM) is heterogeneous and the development of heart failure (HF) is difficult to predict. Exercise echocardiography can provide information about mechanisms involved in the occurrence of HF symptoms: development of intraventricular obstruction, increase in mitral regurgitation (MR) severity, impaired left ventricular (LV) and left atrial (LA) function.

Purpose: To analyse the changes in LV and LA function during exercise and to identify the main correlates of exercise capacity in patients (pts) with HCM, in sinus rhythm and with normal LV ejection fraction.

Methods: We have prospectively enrolled 32 pts (48±17 years, 15 men) with HCM and no obstruction at rest. A symptom limited exercise echocardiogram was performed in all pts using a table ergometer. Maximum LV wall thickness (LVWT), indexed left atrial volume (LAVi), septal E’, E/septal E’ ratio, were measured at rest (r) and during exercise (e). Global longitudinal LV strain (GLS) and LA strain (LA?) were assessed by speckle tracking echocardiography at rest and during exercise. The peak LV outflow tract gradient, systolic pulmonary artery pressure (PAP), and MR degree were recorded at rest and during exercise. Exercise-related symptoms, peak exercise heart rate (HR) and exercise capacity calculated in metabolic equivalents (METs) were also recorded.

Results: The mean value of achieved METs was 5.9±1.4, the peak HR was 124±25 bpm, representing 72±12% of maximal HR, during a mean of 8.5±2.5 minutes of exercise. Thirteen pts developed LV gradients >30 mmHg. Fifteen pts were asymptomatic, while 17 pts reported dyspnea during exercise. There were no significant differences between pts with and without symptoms regarding: age, rE’, rE/E’, rGLS, rLA?, rMR, rPAP, LAVi, eE/e’, eGLS, eMR, ePAP (p>0.05 for all). Symptomatic pts had lower values for eE’ (p=0.01), eLA? (p=0.03) and tended to have higher values for LVWT (p=0.06) and a higher prevalence of eLV outflow tract obstruction (p=0.13) compared to asymptomatic pts. In symptomatic group of pts, E’ (p=0.004), PAP (p<0.001) and GLS (p=0.04) significantly increased and LA? tended to decrease (p=0.18) during exercise. Age (r=-0.44, p=0.01), rE’ (r=-0.40, p=0.02), eE’ (r=0.46, p=0.01), ePAP (r=-0.35, p=0.04) and LVWT (r=-0.32, p=0.07) significantly correlated with achieved METs in HCM pts overall. In multivariate analysis, eE’ (β=0.60, 95% CI 0.122 to 0.009, p=0.003) was the only parameter independently correlated with exercise capacity (expressed in METs). Conclusions: Symptomatic pts had a worse LV diastolic function (as expressed by E’) and a severe LA longitudinal dysfunction (as expressed by LA?) during exercise. E’ during exercise was the only parameter independently correlated with exercise capacity in pts with HCM. These suggest that a detailed analysis of LV and LA function during exercise could provide additional information to predict the occurrence of HF in HCM pts.