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Paradoxical hemodynamic response in patients hypertrophic cardiomyopathy evaluated by supine bicycle stress echocardiography

Abstract: P561

Paradoxical hemodynamic response in patients hypertrophic cardiomyopathy evaluated by supine bicycle stress echocardiography

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Background: Hypertrophic cardiomyopathy (HCM) patients with hemodynamically significant (HS) left ventricular outflow tract obstruction (LVOTO) may show paradoxical hemodynamic response to exercise (PHRE) consisting of a decrease of LVOTO during dynamic stress test. However the prevalence, the mechanism and the clinical significance of such response is not systematically studied.

Aim: To define alterations in the magnitude of LVOT gradient during semi-supine exercise Doppler echocardiography (SEDE) in patients with HCM.

Patients and method: After a comprehensive echocardiographic study 106 patients [57 (54%) males, mean age: 47±13 years] with HCM underwent a multistage symptom limited SEDE. The SEDE protocol started at 25 W with increments of 25 W every 3-minute stage. Peak LVOT gradient was measured by conventional Doppler echocardiography at baseline, and at the peak of exercise. Hemodynamically significant LVOT obstruction was defined as presence of peak LVOT gradient ≥30 mmHg. PHRE was defined when the HS resting LVOTO decreased ≥30 mmHg.

Results: HS resting LVOTO was not present in 46 (43%) patients. SEDE was completed without any complication in all patients. HS LVOT obstruction developed during SEDE in 9 out of 46 patients (20%) without significant resting LVOT obstruction. Analysis of the whole group of HCM showed that resting LVOTO increased significantly at peak exercise (52±46 vs. 80±68 Hgmm, p<0.001). Six patients (10%) out of the 60 patients with HS LVOTO at rest demonstrated PRHE during SEDE, in whom the LVOTO decreased significantly (103±37 vs. 66±12 Hgmm, p<0.001). PRHE did not show any significant relationship with clinical, resting echocardiographic and exercise stress data.

Conclusion: Resting LVOT gradient may significantly decrease during dynamic exercise in patients with HCM. The prevalence of this PHRE is relatively low. Further studies are needed to clarify the mechanism and clinical significance of PHRE in patients with HCM