Prevention

LEFT VENTRICULAR RELAXATION IS IMPAIRED IN SUBJECTS WITH LV CONCENTRIC REMODELING

Poster Contributions
Poster Sessions, Expo North
Sunday, March 10, 2013, 3:45 p.m.-4:30 p.m.

Session Title: Prevention: LV, Vascular and Lipoprotein Function
Abstract Category: 24. Prevention: Clinical
Presentation Number: 1233-15

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Background: Several studies have demonstrated that left ventricular (LV) mass is related to cardiac systolic and diastolic dysfunction. However, little is known about pathophysiology of concentric LV remodeling (CR) with normal LV mass and small LV cavity. The aim of this study was to evaluate the correlation between CR and LV function in a medical checkup based cohort.

Methods: A total of 1048 adults without systolic dysfunction or other heart disease (mean age 63±13, 59% men) underwent a thorough medical examination including tissue Doppler echocardiography to evaluate diastolic function (septal E’, E/E’, E/A, DCT), LV mass index (LVMI) and relative wall thickness (RWT). All the subjects were categorized into four LV geometric patterns by LVMI and RWT according to the method of Devereux, Simone, Daniels et al.: Concentric hypertrophy (CH) was defined as LVMI > 51g/ m2.7, RWT > 0.42, and eccentric hypertrophy (EH) as LVMI > 51g/ m2.7, RWT ≤ 0.42. Concentric remodeling (CR) was defined as normal LVMI (≤ 51g/ m2.7) with RWT > 0.42, and normal geometry (N) as normal LVMI with RWT ≤ 0.42.

Results: 51(538/1048)% of subjects were in N group, 27(287/1048)% in CR, 13(132/1048)% in CH and 9 (91/1048)% in EH. The proportion of CR increased with age. CR group had significantly lower E’, and higher E/E’ than N group, and had higher E’ than CH group, however this tendency did not differ between sex. In CR group, as well as CH and EH, E/A was significantly lower and DCT was higher than those in N group (ANOVA with post hoc, Tukey-Kramer). There was no significant difference in systolic function, right ventricular systolic pressure and BNP levels between CR group and N group. Multiple logistic regression analysis adjusted for age, sex, cardiovascular and metabolic risk factors and pulmonary function (CR vs. N) indicated that age (OR 1.057, 95%CI 1.038-1.075), HbA1c (OR 1.241, 95%CI 1.129-1.065) and serum sodium (OR 1.115, 95% CI 1.020-1.220) were independent predictors of CR, whereas sex and obesity indexes (BMI and waist circumference) were not.

Conclusion: LV relaxation is impaired in subjects with CR. Age, HbA1c and serum sodium are independent predictors of CR.