CARDIOMYOPATHY IN MITRAL VALVE PROLAPSE

E. Malev¹, E. Zemtsovsky², L. Vasina¹, A. Pshepiy¹, A. Korshunova²
¹Almazov Federal Heart, Blood and Endocrinology Centre, Saint-Petersburg, Russia
²Saint-Petersburg State Pediatric Medical University, Saint-Petersburg, Russia

Purpose: In some inherited connective tissue diseases with involving of the cardiovascular system, e.g. Marfan syndrome has been reported early impairment of LV function, which have been described as Marfan-related cardiomyopathy. Our aim was to evaluate the LV function in young adults with mitral valve prolapse (MVP) without significant mitral regurgitation using two-dimensional strain imaging and the possible role of transforming growth factor-B (TGF-β) pathway in its deterioration.

Methods: We studied 78 asymptomatic young subjects (mean age 19.7±1.6, 72% male) with MVP in comparison with 80 sex- and age-matched healthy subjects. Longitudinal strain and strain rate (SR) were determined from three apical views, using spackle tracking (Vivid 7 Dimension, EchoPAC’08) with grey-scale frame rate 50-55/sec. Concentrations of TGF-β1 and B2 in serum were determined by enzyme-linked immunosorbent assay using a test system Human Platinum ELISA.

Results: During the k-means clustering we have identified two clusters of subjects with MVP: first cluster (17 subjects, 28% of the MVP group) and second cluster (61 subjects, 72%). In 1st cluster observed a significant reduction of global systolic strain compared with the control group (-15.5±2.9% vs. -19.6±3.4%; p=0.00001) and the 2nd cluster (-15.5±2.9% vs. -20.6±3.8%; p=0.00001). Diastolic global SR was also decreased compared with the control group (1.3±0.25/s vs. 1.62±0.25/s; p=0.0001) and the 2nd cluster (1.3±0.25/s vs. 1.56±0.26/s; p=0.00001). Global strain in the second cluster did not differ significantly from the control group (p=0.1), but there are significant decrease of local longitudinal systolic strain (-17.1±3.2% vs. -20.7±3.1%; p=0.001) and diastolic SR (1.38±0.25/s vs. 1.55±0.22/s; p=0.00001) in interventricular septum.

In first cluster high TGF-β1 serum level (>14.75 ng/ml) was detected in 2 subjects, TGF-β2 (>2.0 ng/ml) in 11, and both TGF-β1/β2 in one subject. In 2nd cluster high TGF-β2 level observed only in 10 subjects (x²=41.1; p=0.00001).

Conclusions: These changes of deformation may be the first signs of deterioration of the LV function in young adults with MVP, which may be caused by increased TGF-β signaling and myocardial fibrosis.

Declaration of interest: none.