

Radial myocardial strain and biochemical markers of myocardial damage in children with hypertrophic cardiomyopathy.

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Introduction: hypertrophic cardiomyopathy is a severely condition in children. Early detection of myocardial dysfunction allows to begin the treatment early in the disease.

Material and methods. 49 patients with hypertrophic cardiomyopathy (HCM) in age from 7 to 17 years (median 9 years) were examined by echocardiographic study. Radial myocardial strain was determined in 2D speckle tracking mode in 12 segments of the basal and medial part of the left ventricle (parasternal position, the short axis). Using the method of polynomial regression, we studied the interaction between: the radial deformation of the left ventricular myocardium, the thickness of the myocardial segment, troponin M and troponin I.

Results. Radial strain of the left ventricle myocardium ranged from 0.69 to 59.6%, the thickness of the myocardial segments varied from 6 to 43 mm. All children had asymmetric myocardial hypertrophy, more expressed in the anterior, anterior-septal basal and medial segments of the left ventricle. For myocardial segments with the thickness 4.24 Z-score or more, we discover decrease in radial deformation (less than 20%). In 15 children (30.6%) with number of hypertrophic segments from 3 to 7, was found an increase in biochemical markers of myocardial ischemia — troponin M ($M \pm 2\sigma = 0.19 \pm 0.1$ ng / ml) and troponin I ($M \pm 2\sigma = 0.76 \pm 0.1$ μ g / l). The negative correlative relationship was obtained between these indicators and the radial deformation of the left ventricular myocardium ($r = -0.6$ and $r = -0.59$).

Conclusions. Changes in radial strain of the left ventricular myocardium in children with HCM reflect a systolic myocardial dysfunction, which is the basis for further observation and therapy.