Evaluation of Left Atrial Function Using Two-Dimensional Speckle Tracking Echocardiography in Children with Type 1 Diabetes Mellitus

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Introduction: Left atrial (LA) deformation analysis by two-dimensional speckle tracking echocardiography (2D-STE) has recently been proposed as an alternative approach conventional echocardiography. Aim of this study is the evaluation of left atrial function with Speckle-tracking echocardiography in pediatric patients with Type 1 Diabetes Mellitus who did not yet develop micro and macro vascular complications, at least 3 years at last 10 years followed up.

Method: A total of 63 patients without diabetic complications (mean age: 13.81 years) and 36 healthy (mean age: 12.42 years) children were included in this study. Conventional transthoracic echocardiography and left atrial speckle tracking echocardiography were performed in all patients. Images of the LA were acquired from apical two- and four-chamber views. The LA strain (%) (LAS) parameters systolic [LAS-S], early diastolic [LAS-E], late diastolic [LAS-A] during atrial contraction were assessed. The LA volumes (LAV) were calculated using the biplane area-length method. The LA volume indices (LAVI) were calculated by dividing the LA volumes by the body surface area.

Results: Results of diabetic group and healthy children were compared. In diabetic group, LAS–S (39.91±9.08/45.88±8.85 p<0.003) LAS-A (13.43±4.68/15.82±5.02 p<0.003) and LAS-E (26.86±7.54/29.77±7.65 p<0.003) were found decreased and LAVI (ml/m2) (26.10±2.81/23.53±2.04 p<0.003) was found increased. Additionally, Mitral valve A wave velocity (0.58±0.14/0.50±0.10 p<0.003) increased, E/A wave ratio (1.76±0.37/2.11±0.34 p<0.003) decreased. There were no statistical significant difference in systolic function with conventional echocardiographic examinations.

Conclusions: We found deterioration in atrial functions with speckle tracking echocardiography methods in Type 1 DM patients without diabetic complications. Early detection of effects on target organs may prevent the irreversible damage and taking preventive measures are important in terms of improving the quality of life.