

Right ventricular longitudinal strain assessment in children with severe pulmonary arterial hypertension associated with congenital heart defects

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Objectives. Right ventricular function has been identified as an important prognostic factor in children with pulmonary arterial hypertension. The aim of the study was to assess the right ventricular longitudinal strain in children with severe pulmonary arterial hypertension associated with congenital heart defect.

Methods. We evaluated prospectively 37 children (16 children with severe pulmonary arterial hypertension associated with congenital heart defects; and 21 age and sex match controls) using conventional and speckle-tracking echocardiography (iE33, Q LAB 10), brain natriuretic peptide level and clinical parameters (WHO functional class, 6-minute walk test). Right ventricular free wall strain was measured by averaging three (basal, medial, apical) regional peak systolic longitudinal strain/strain rate.

Results. Right ventricular free wall longitudinal strain and strain rate were significantly lower in patients group compared with controls ($p < 0.05$); both has been correlated with right ventricular fractional area change, myocardial performance index, left ventricular eccentricity index and brain natriuretic peptide level ($r = - 0.49$, $r = 0.58$, $r = 0,64$, $r=0,41$ respectively $r = - 0.38$, $r = 0.44$, $r=0,46$, $r=0,41$) with a $p < 0.05$.

Conclusions. Right ventricular longitudinal strain/strain rate assessment is useful in noninvasive evaluation of right ventricular function in children with pulmonary arterial hypertension associated with congenital heart defects.

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Key words: right ventricle, longitudinal strain, congenital heart defects, pulmonary arterial hypertension, children