

Assessment of tricuspid annular motion by speckle tracking in children with pulmonary arterial hypertension secondary to ventricular septal defect.

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Introduction. Accurate evaluation of right ventricle (RV) function is fundamental in the management of pulmonary arterial hypertension (PAH) in children. Tissue motion annular displacement (TMAD) of the tricuspid annulus is an angle-independent method to assess annular motion. The aim of the study was to evaluate the utility of TMAD along with RV longitudinal strain, in assessment of RV function in children with severe pulmonary arterial hypertension secondary to ventricular septal defect (PAH-vsd).

Material and methods. We prospectively evaluated twelve children with PAH-vsd and twelve sex and age match controls. Beside conventional echocardiography, speckle tracking analysis of the right ventricle was performed using Q LAB 10.0 software. The following parameters were studied: tissue motion annular displacement (TMAD) of the tricuspid annulus (lateral, septal and midpoint), longitudinal strain of the RV (free wall and global), TAPSE (M-mode), right ventricular fractional area change, right ventricular myocardial performance index, left ventricular excentricity index and brain natriuretic peptide.

Results. TMAD of the tricuspid annulus (lateral, septal and midpoint) and RV longitudinal strain (free wall and global) were significantly lower in PAH-vsd children than in controls ($p=0,0003$, $p<0,0001$, $p<0,0001$ for TMAD, respectively $p=0.0001$, $p=0.0001$ for RV longitudinal strain). TMAD significantly correlated with all the studied parameters. TMAD showed the best correlation with the M-mode measured TAPSE, and with RV free wall and global longitudinal strain ($r= 0,82$, $r= 0,58$, $r= 0,64$, with a $p< 0.05$ for TMAD lat; $r= 0,77$, $r= 0,64$, $r= 0,70$, with a $p< 0.05$ for TMAD septal, respectively $r= 0,83$, $r= 0,61$, $r= 0,67$, with a $p< 0.05$ for TMAD midpoint).

Conclusion. Tricuspid Annular Motion assessment by Speckle Tracking (TMAD), along with longitudinal strain indices of the RV, is useful in noninvasive assessment of right ventricle performance in PAH-vsd children.

Key words: speckle-tracking echocardiography, tissue motion annular displacement, pulmonary arterial hypertension, ventricular septal defect, children