

Tricuspid annular peak systolic velocity (TAPSV) in children and young adults with pulmonary artery hypertension secondary to congenital heart diseases and tetralogy of Fallot: comparison with MRI data

Koestenberger M. (1), Nagel B. (1), Fritsch P. (1), Ravekes W. (2), Avian A. (3), Heinzl B. (1), Sorantin E. (4), Cvirn G. (5), Gamillscheg A. (1)

(1) Division of Pediatric Cardiology, Department of Pediatrics, Medical University Graz, Austria

(2) Division of Pediatric Cardiology, Johns Hopkins University School of Medicine, Baltimore, MD, USA

(3) Institute for Medical Informatics, Statistics and Documentation, Medical University Graz, Austria

(4) Division of Pediatric Radiology, Department of Radiology, Medical University Graz, Austria

(5) Institute of Physiological Chemistry, Centre of Physiological Medicine, Medical University Graz, Austria

The tricuspid annular peak systolic velocity (TAPSV), as echocardiographic index to assess right ventricular (RV) systolic function, has not been investigated thoroughly in children and young adults with tetralogy of Fallot (TOF) and pulmonary artery hypertension secondary to congenital heart disease (PAH-CHD). TAPSV values of patients with TOF (n=185) and PAH-CHD (n=55) were compared to age-matched normal subjects. TAPSV values were compared to RVEF and RVEDVi determined by MRI. TAPSV values become significantly reduced after an age of 10.4 years in PAH patients, and after an age of 13.6 years in TOF patients when compared to the lower bound of the ± 2 SD interval of normal subjects. A significant positive correlation between TAPSV with RVEF was seen in both, TOF ($r = 0.66$, $p < 0.001$) and PAH-CHD ($r = 0.82$, $p < 0.001$) patients. A significant negative correlation between TAPSV with RVEDVi was also seen in TOF ($r = -0.29$, $p = 0.002$) as well as in PAH-CHD patients ($r = -0.59$, $p < 0.001$). Although initially preserved, we found impaired TAPSV values with increasing age in patients with TOF and PAH-CHD. This indicates that persistent pressure overload in PAH-CHD patients as well as volume overload in TOF patients can lead to an impairment of systolic RV function and increased RVEDVi. The validity of TAPSV data could be confirmed by MRI data (RVEDVi and RVEF).