a specificity of 80%. Moreover, IVA was found to be the least load-dependent while basal 2D-Strain and RMPI appeared to be afterload and preload dependent.

Conclusions.— In patients with a suspicion of RV dysfunction, S’ and RVFAC are frequently discordant (50% of the patients). Using a group of highly probable RV dysfunction (S’ < 10 cm/s and RVFAC < 33%), we found that IVA and basal 2D-Strain have both a good diagnostic value. Moreover, contrary to 2D-strain, IVA was not influenced by loading conditions, adding to its diagnostic value. Our results underline the need of a multiparametric approach to diagnose RV dysfunction and for this setting both IVA and 2D strain could help.

http://dx.doi.org/10.1016/j.acvd.2013.03.020

20

Comparative echocardiographic evaluation of right ventricular function in Eisenmenger syndrome and idiopathic pulmonary arterial hypertension


CHU Nancy-Brabois, Nancy, France

Background.— Despite comparable morbidity, survival prospects for Eisenmenger pts are far superior compared with pts with idiopathic pulmonary arterial hypertension (PAH). This improved survival is likely the result of the preservation of RV function, since it does not remodell at birth and remains hypertrophied and adapted to pressure overload.

Aim of study.— We compared the echocardiographic parameters of right heart function between pts with Eisenmenger syndrome and pts treated for idiopathic PAH, with an equal level of systolic PAPs (PAPs).

Patients.— We studied 15 pts with Eisenmenger (group 1: three CAVC, six ASD, two VSD, two ductus arteriosus, one TOF, one agenesis of pulmonary artery) and 15 pts with PAH (gr2). All subjects underwent a right heart catheterization and echocardiography within the same week. Each gr2 pt was matched to a gr1 pt according to age, sex and level of PAPs (± 5 mmHg). The following indices of RV function were obtained: TAPSE (mm), RV fractional area change (RVFAC, %), myocardial performance index (Tei) and maximal velocity of systolic wave (S max, cm/s) of the lateral tricuspid annulus.

We measured maximal longitudinal strain (e, %) in the three segments of the 3 RV walls (septal (sep), lateral (lat) from 4Cview and inferior (inf) from RV2Cview) by 2D speckle imaging. We calculated a lat e (mean of 3 lat segments), an inf e (mean of 3 inf segments) and an inferolat e (mean of these two walls).

Results.— The surfaces of the RA and RV were not significantly different while the ratio RV/LV was significantly higher in the PAH group (P = 0.03). There was no difference in any of the RV function parameters between both groups although there was a non-significant trend toward lower values of strain in gr2.

Gr1, Eisenmenger Gr2, PAH P value

Age (yrs) 50.2 ± 15.8, 54.1 ± 17.8, 0.06
IT gd max (mmHg) 78.3 ± 25.8, 77.9 ± 23.4, 0.92
Cardiac index (l/m²/min) 2.9 ± 0.9, 2.5 ± 0.7, 0.29
RV/LV 1.3 ± 0.5 1.7 ± 0.5, 0.01
Smax (cm/s) 10.8 ± 3.5, 10.6 ± 1.8, 0.51
TAPSE (mm) 19.0 ± 8.6, 15.9 ± 3.9, 0.43
RV FAC (%) 0.36 ± 0.14, 0.31 ± 0.07, 0.25
RV Tei 0.52 ± 0.22 0.53 ± 0.19, 0.86

TTE allowed measurement of other right ventricular parameters: tricuspid regurgitation velocity (277 ± 56 cm/s), tissue Doppler-derived tricuspid lateral annular systolic velocity (15.8 ± 6.5 cm/s) and tricuspid annular plane systolic excursion (19.7 ± 5.2 mm (TAPSE). TEE allowed measurement of right ventricular fractional area change (33 ± 13%). Mean values (Student test) were significantly different for RV/LV ratio (P = 0.03) and eccentricity index (P = 0.03) between patients with PFO compared to patients without PFO and for right ventricular fractional area change (P = 0.0002) and TAPSE (P = 0.05) between patients with ACP compared to patients without ACP.

Conclusion.— These results in patients with early severe ARDS under protective mechanical ventilation found prevalence of 22.5% of ACP and 15.5% of PFO. Low TTE sensitivity requires TEE for diagnosis of PFO and ACP. PFO was associated with significantly increase of RV/LV ratio and eccentricity index. ACP was associated with significantly decrease of right ventricular fractional area change and TAPSE.

Acknowledgement.— Grant acknowledgement, SRLF 2008.

http://dx.doi.org/10.1016/j.acvd.2013.03.021
Detection of pulmonary arteriovenous malformation by contrast echocardiography in pediatric hereditary hemorrhagic telangiectasia

P. Balagny, C. Karam, O. Dubourg, N. Mansencal

Background.— In hereditary hemorrhagic telangiectasia (HHT), assessment of pulmonary arteriovenous malformations (PAVMs) may be difficult in pediatric patients. The aim of this study was to assess the reliability of contrast echocardiography in a pediatric population presenting with HHT.

Patients.— We prospectively studied 22 pediatric patients presenting with HHT. All these patients underwent transthoracic contrast echocardiography (TTCE) and low-dose thoracic computed tomography (CT). Each TTCE examination was performed using second harmonic imaging, allowing to improve the quality of 2-dimensional imaging. The contrast protocol consisted of the injection of agitated 5% glucose solution through an upper extremity vein. We used the classification proposed by Barzilai et al.: grade 0 means no opacification of the left ventricle after the first three cardiac cycles following contrast appearance in the right atrium, grade 1 minimal opacification; grade 2, moderate; grade 3, extensive opacification without outlining the endocardium; and grade 4, extensive opacification with clear endocardial definition. We considered CT as normal when no PAVMs or only one microscopic PAVMs was detected.

Results.— Mean age of the population was 11 ± 5 years (12 male). A PAVM was detected in 10 patients (45%) by CT. TTCE was feasible in all pediatric patients. Using TTCE, a grade 0 was found in four patients, a grade 1 in seven patients, a grade 2 in five patients, a grade 3 in six patients and no patient had a grade 4. In case of grade 0 or 1, no patient had a significant PAVM, whereas for grade 2 and 3, all patients except one had PAVMs. The sensitivity and specificity of TTCE for the detection of PAVMs was respectively 100% and 92%.

Conclusion.— Detection of PAVMs by TTCE is feasible in pediatric patients presenting with HHT. The reliability of TTCE is high in this specific population. Low-grade classification could presumably allow to avoid CT irradiation in pediatric patients.

http://dx.doi.org/10.1016/j.acvd.2013.03.023