Non Invasive Imaging

RIGHT ATRIAL FUNCTION IS IMPAIRED IN PULMONARY ARTERIAL HYPERTENSION AND REFLECTS RIGHT VENTRICLE FAILURE: THE IMPRES TRIAL

Poster Contributions
Hall C
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Background: Right atrial (RA) pressure is a known prognostic measure in pulmonary arterial hypertension (PAH). However, little is known about RA function in PAH

Methods: We used myocardial deformation imaging by speckle tracking to study RA function. Reservoir (RA strain), conduit (RA early strain rate [eSR]), and active (RA late SR) phases were assessed in 64 patients with severe PAH defined by PVR>800 dynes.sec/cm-5 despite PAH 2 specific therapies who were enrolled in the Imatinib in PAH, double-blind, placebo-controlled, Randomized Efficacy Study (IMPRES), and were compared to 30 healthy controls of similar age and gender. Association of RA function with invasive pulmonary hemodynamics, right ventricular (RV) function, and NT-proBNP were studied.

Results: Even after adjusting for RA area and estimated pressure, RA strain and eSR were reduced in PAH patients compared to controls (26.1±12.8 vs 56.9±12.7, adjusted p<0.001 and 0.5±0.4 vs -1.5±0.5, adjusted p<0.04, respectively) while RA late SR was similar (-1.4±0.7 vs -1.5±0.4, p=0.48). RA strain and eSR were strongly associated with measures of RV function, but not with mean pulmonary artery pressure or pulmonary vascular resistance (Table 1). RA strain in particular was also strongly associated with elevated NT-proBNP independent of RA size or pressure.

Conclusions: RA reservoir and passive conduit functions are impaired in PAH, independent of RA size and pressure, and likely reflect RV failure.

Table 1: Pearson's correlation coefficients of RA functional measures with invasive hemodynamics, RV function and NT-proBNP		
	RA strain (Reservoir function)	Early strain rate (Conduit function)
Invasive Measurements		
MPAPΨ	r=-0.07, p=0.61	r=-0.04, p=0.75
PVRΨ	r=-0.04, p=0.74	r=-0.08, p=0.51
RV function measurements (Echo)		
RVFAC	r=0.68, p<0.0001	r=-0.66, p<0.0001
TEI INDEX	r=-0.60, p<0.0001	r=0.54, p<0.0001
RV FWLS	r=-0.74, p<0.0001*	r=0.66, p<0.0001*
Other		
NT-proBNP	r=-0.50, p=0.0001*	r=0.03, p=0.82
MPAP: Mean pulmonary artery pressure; PVR: Pulmonary vascular resistance; RVFAC: right ventricle fractional area change; RV FWLS: right ventricle free wall longitudinal strain. ΨBased on Spearmans' correlation coefficient. *Independent of right atrium size and pressure		