



Imaging

RIGHT ATRIAL EMPTYING FRACTIONS ARE ASSOCIATED WITH SURVIVAL IN PULMONARY ARTERIAL HYPERTENSION

Poster Contributions

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Background: Parameters of left atrial function have prognostic importance in left-sided heart failure. Analogous parameters of right atrial function have been sparingly investigated right ventricular (RV) failure. We investigated associations between right atrial emptying fraction (RAEF) and survival in pulmonary arterial hypertension (PAH).

Methods: We identified echocardiograms performed at Stanford from 2002-2011 on treatment-naïve subjects aged greater than 18 years with WHO group 1 PAH. All subjects had clinical assessment, six-minute walk distances (6MWD) and cardiac catheterization within one month of the echocardiogram. The total, passive and active RAEF were calculated from the maximal right atrial volume (RAV), the minimal RAV and the RAV coincident with the p-wave. All RAV were measured using the 2 dimensional area-length method. Linear regression was used to compare RAEF with 6MWD, NT-proBNP, and catheterization parameters. We used Cox proportional hazards models to compare survival between high and low RAEF.

Results: Our total cohort comprised 42 subjects. Mean age was 41±15 years and 71% were female. Median NYHA class was 3. Mean length of follow up was 4.2±2.3 years. Mean 6MWD and mean pulmonary arterial pressure were 379±128 meters and 55±12 mmHg respectively. Total and active RAEF were correlated with each other ($P<0.001$), as was passive RAEF with total RAEF ($P=0.007$). In our univariate analysis, both total and active RAEF were associated with tricuspid annular plane systolic excursion (TAPSE) ($P=0.03$ and 0.02 , respectively). TAPSE was associated with 6MWD ($P=0.009$), NT-proBNP ($P<0.001$), Fick cardiac index ($P=0.007$) and right atrial pressure on catheterization ($P=0.02$), whereas no measures of RAEF were associated with these ($P>0.1$ for each). In our survival analysis, a total RAEF $< 16.2\%$ was associated with reduced survival (HR 3.7; 95% CI 1.1-12.2; $P=0.03$), as was an active RAEF $< 4.4\%$ (HR 4.9; 95% CI 1.3-18.1; $P=0.02$).

Conclusion: In our treatment-naïve PAH cohort, total and active RAEF are associated with survival. Further studies are needed to validate our findings, correlate RAEF to other echocardiographic parameters, and assess the significance of serial changes.