Supplementary Material

An echocardiographic score predicts severe pulmonary hypertension in patients with interstitial lung disease

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Echocardiographic technique

Echocardiographic examinations were performed using Vivid 7 (General Electric Healthcare, Milwaukee, WI) and IE-33 ultrasound systems (Philips Medical system, Andover, Massachusetts). Three consecutive cardiac cycles were averaged for each parameter. The gradient between the right ventricle (RV) and the right atrium (RA) was derived from the peak velocity of the tricuspid regurgitation (TR). RA pressure was estimated based on the inferior vena cava (IVC) diameter and collapse. RVSP was estimated by adding RA pressure to the pressure differential between RV and RA. The pulmonary flow acceleration time was obtained using pulsed Doppler in the right ventricular outflow tract (RVOT) close to the pulmonary valve in the parasternal short axis (PSAX) view [1, 2]. The mean PAP and diastolic PAP were estimated using continuous wave Doppler of the pulmonary regurgitation (PR) jet in the PSAX view by measurement of the early and end diastolic velocities. The tricuspid annular plane systolic excursion (TAPSE) was measured using M-mode from the tricuspid lateral annulus. RV fractional area change (FAC) was calculated from the apical four chamber view using RV end-diastolic – RV end-systolic area / RV end-diastolic area. The LV eccentricity index was calculated as the ratio between the antero-posterior diameter and the septo-lateral diameters of the left ventricle (LV) during end-systole on a PSAX view [3]. The RV/LV ratio was obtained by using the antero-posterior diameters of the RV and the LV on a PSAX view at end-systole. Left atrial (LA) area and right atrial (RA) area were measured on apical four chamber view. Patients with evidence of pulmonary stenosis, right ventricular outflow tract obstruction or with double chambered right ventricle were excluded. Mean pulmonary artery pressure was calculated by adding the estimated right atrial pressure

to the early diastolic gradient between the pulmonary artery and the right ventricle, estimated by measuring the early diastolic pulmonary regurgitation velocity using the simplified Bernoulli method ($4xV^2_{max}$).

Figure legends

Figure S1: Univariable reciever operator curve analysis to predict severe PH

The area under the curve (AUC) analysis for each individual variable is illustrated to predict severe pulmonary hypertension (mPAP≥35mmHg) at right heart catheterisation.

Abbreviations: TRv peak tricuspid regurgitation, PAPs pulmonary artery systolic pressure (TRvmax + RAP (right atrial pressure)), mPAP mean pulmonary artery pressure (derived from early diastolic pulmonary regurgitation velocity added to right atrial pressure), PRV max early diastolic pulmonary regugitation velocity without RAP, TAPSE tricuspid annular planar systolic excursion

Figure S2: Receiver operating curve analysis with major ILD groups excluded

To ensure that no one group over-influenced the findings, ROC analysis of the score was performed with each of the major ILD subtypes excluded (IPF, CTD-ILD and sarcoidosis), which showed no difference in the predictive ability of the score when analysing different ILD subgroups.

Abbreviations: ILD interstitial lung disease, IPF idiopathic pulmonary fibrosis, CTD-ILD connective tissue disease-associated ILD, ROC receiver operating curve

References

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