

Online supplementary material

Materials

Experimental model of chronic pulmonary hypertension

Sham surgical procedures were performed in 6 other piglets (Sham group), including midline sternotomy and 5 weekly injections of saline in the segmental arteries of the right lower lobe.

Conductance measurements

Synchronous pressure and volume signals were recorded at weeks 6 and 12 using a 4-Fr conductance-catheter (CD Leycom, Zoetermeer, The Netherlands) inserted in the right ventricle via percutaneous puncture of the right internal jugular vein. Another sensitive pressure catheter (Pulsion Medical Systems, Munich, Germany) was inserted in the right femoral artery to continuously monitor mean systemic blood pressure (MBP). Baseline measurements for stroke volume (SV), maximal (dP/dt_{max}) and minimal (dP/dt_{min}) rates of rise of RV pressure, relaxation time constant (τ) and RV stroke work were recorded. Stroke volume was indexed to BSA (SVI). An 8-Fr balloon-tipped catheter was introduced through the right femoral vein and positioned under fluoroscopic guidance in the inferior vena cava, just below the right atrial cavity (20-mm Occlusion Balloon Catheter, Boston Scientific/Medi-Tech, Watertown, MA, USA). It was inflated to transiently reduce RV inflow and assess end-systolic pressure-volume (PV) relationships.

Echography of the right ventricle

RV assessment by echocardiography was performed at week 6 under general anaesthesia, 10 minutes before right heart catheterization and PV loops measurements (Vivid E9, General Electric Medical System, Milwaukee, WI, USA). The maximal transverse diameter of the right ventricle (RVEDD) was measured at the end-diastolic time on a 4-chamber view (B-mode), as well as the RV end-diastolic area which was further indexed to the BSA (RVEDA). The right ventricular fractional area change (RVFAC) was defined as the percent area change between end-diastole and end-systole (2D quantification). The right ventricular myocardial performance index (RVPMI) was calculated as the ratio of isovolumic contraction and relaxation time divided by contraction time (Pulse Doppler of the pulmonary and tricuspid

valves). The tricuspid annular plane systolic excursion (TAPSE) was measured using M-mode as the maximal excursion of the lateral part of the tricuspid annulus.

Supplemental Figure

Supplemental Figure 1. Comparison of the RVFAC/sPAP ratio and the TAPSE/sPAP ratio at rest and relationships between RVFAC, TAPSE and sPAP. PH group, n=13; Sham group, n=6. PH: pulmonary hypertension; RVFAC: right ventricular fractional area change; TAPSE: tricuspid annular plane systolic excursion; sPAP: systolic pulmonary artery pressure.

* explains $P < 0.05$ for comparison between groups.