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Title: The effect of treatment on right ventriculo-arterial coupling in idiopathic pulmonary arterial hypertension

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Body: Introduction: Right heart failure is the main cause of death in idiopathic pulmonary arterial hypertension (IPAH). Current medication aims to reduce right ventricular (RV) afterload, but the effect on RV function is unknown. Therefore, we aimed to assess the influence of PAH-specific treatment on load-independent RV systolic function and RV-arterial coupling. Methods: In 39 IPAH patients we determined RV end-systolic elastance (Ees), arterial elastance (Ea) and RV-arterial coupling (Ees/Ea) at baseline and follow-up. Maximal isovolumic pressure (Piso) was estimated from RV pressure curves with the single-beat method. Ees=(Piso-mPAP)/SV and Ea=mPAP/SV. (SV=stroke volume, mPAP=mean pulmonary artery pressure, both measured using right heart catheterization) Results: Median follow-up (FU) time was 0.8 years (interquartile range 0.5-1.0). PAH-therapy lowers mPAP, pulmonary vascular resistance and mean right atrial pressure and increases cardiac index ($p<0.01$ for all). Figure 1 shows Ees, Ea and Ees/Ea. Under PAH-therapy, Ees and Ea decreases ($p=0.01$ and $p<0.01$ respectively), and Ees/Ea increases($p=0.01$). Conclusions: PAH-specific treatment decreases both arterial and end-systolic elastance. Whether the improvement in RV-arterial coupling results from an RV-specific treatment effect or is secondary to the decreased afterload, is a subject for further research.