Abstract: **P5953**

Venous remodelling in COPD pulmonary hypertension and idiopathic pulmonary arterial hypertension

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Background: Pulmonary arterial remodelling is known to correlate to the severity of precapillary pulmonary hypertension (pPH) in end-stage COPD and idiopathic pulmonary arterial hypertension (IPAH). Scarce information is available regarding venous remodelling in PH.

Purpose: To investigate the extent of venous remodelling in COPD-PH and IPAH.

Methods: 409 end-stage COPD patients with right heart catheterization (RHC) data were evaluated for lung transplantation during 1991–2010 (follow up until 2015) at our university hospital. Of these 301 (74%) underwent transplantation. Four hemodynamic groups were included in an analysis of venous involvement in explanted lungs: 1) non-PH (n=30, mPAP <25 mmHg), 2) mild-moderate pPH (n=30, mPAP 25–34 mmHg, PAWP ≤15 mmHg), 3) severe pPH (n=10, mPAP ≥35 mmHg, PAWP ≤15 mmHg), 4) postcapillary PH (pcPH) (n=33 mPAP ≥25 mmHg, PAWP >15 mmHg), compared to IPAH (n=16, mPAP >50 mmHg). Two–three sections from each lobe were stained with hematoxylin and eosin and for elastin and examined by the same cardiovascular pathologist who was blinded to the hemodynamics.

Results: COPD-nonPH patients had pathological venous remodelling (range 0–1; 40% grade 0, 60% grade 1). COPD-PH had increased venous involvement dependent on hemodynamic group: Mild-moderate pPH (range 0–2; 23% grade 0, 64% grade 1, 13% grade 2); Severe pPH (range 0–2; 20% grade 0, 70% grade 1, 10% grade 2); COPD-pcPH (range 0–2; 30% grade 0, 67% grade 1, 3% grade 2), while IPAH patients had the lowest porportion of unaffected veins and highest proportion of severe remodelling (range 0–2; 13% grade 0, 63% grade 1, 25% grade 2).

Conclusion: A novel grading scheme for venous remodelling in pulmonary hypertension is introduced. Myofibroblast proliferation appears in pulmonary veins in both COPD-pPH and COPD-pcPH. Remarkably, IPAH patients presented with advanced forms of venous remodelling, emphasizing that the disease is not restricted to arterial lesions exclusively.

Grade 0	No pulmonary venous involvement (thin wall, no prominent muscle layer, indistinct elastic lamina)
Grade 1	Intimal fibrosis or excentric medial hypertrophy/arterialisation (intimal fibrotic thickening, tendency of elastic lamina duplication)
Grade 2	Intimal fibrosis and excentric medial hypertrophy/arterialisation (intimal fibrotic thickening, smooth muscle cell hyper-plasia, usually with more elaborate elastosis)