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Title: Left atrial enlargement is not rare in PAH- RA/LA ratio is significantly lower in PH due to left heart disease

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Body: Patients with pulmonary hypertension (PH) and a left ventricular dysfunction frequently show a pathological mitral valve inflow pattern, tissue doppler abnormalities and a left atrial enlargement. However, it is questionable, if left atrial enlargement exclusively indicates pulmonary venous hypertension. We studied a cohort of 168 patients with PH of our PH center and 67 controls and analysed left and right atrial area as well as the RA/LA-ratio. PH had been diagnosed according to the guidelines including right heart catheterization in all patients. The cohort comprised patients with PH of group 1 PAH (n=82) ,2 PH due to left heart disease(n= 13), 3 PH due to lung disease (n=39), 4 CTEPH (n= 27) and 5 miscellaneous PH (n=7). Left atrial and right atrial enlargement respectively was found as follows: PAH (46 %/62%), PH 2 (77%/77%), PH3 (41 %/66%), CTEPH (22 %/64%), PH 5 (50 %/60%). Controls (30 %/16%). Right/left atrial area-ratio was different from controls: PAH: 1.15, p<0.001; PH 2:0.89, p=0.92; PH 3: 1.31, p<0.001, CTEPH: 1.37, p=0.001 and PH 5: 2.44, p= 0.30. Right/left area ratio of patients with PAH (p<0.001), PH 3 (p<0.001) and CTEPH (p 0.001) was significantly different from patients with pulmonary venous hypertension. In patients with PH not related to left heart disease atrial fibrillation seems to be predictive for left atrial enlargement. Conclusion: Even in patients with PAH left atrial enlargement is not a rare finding. Due to an even more dilated right atrium in PAH, PH 3, CTEPH than in PH due to left heart disease, the RA/LA-area-ratio is significantly lower in patients with PH due to left heart disease and might be a more helpful non invasive tool.