European Respiratory Society
Annual Congress 2013

Abstract Number: 2916

Publication Number: P4092

Abstract Group: 4.3. Pulmonary Circulation and Pulmonary Vascular Disease

Keyword 1: Pulmonary hypertension **Keyword 2:** Circulation **Keyword 3:** Imaging

Title: Accuracy and precision of assessment of pulmonary vascular resistance

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Body: Aim: pulmonary vascular resistance (PVR) is a key hemodynamic data in the diagnosis and the management of pulmonary hypertension (PH). A reliable, simple and non-invasive method of PVR assessment would be of great value. Method: 101 patients underwent both right heart catheterism (RHC) and echocardiography (ECHO). RHC: Right atrial, mean pulmonary artery pressure (RAp and MPAp) and cardiac output (CO; Fick method) were measured. PVR (WU) were also calculated as follow PVR=(MPAp-RAp)/CO. ECHO: PVR were calculated by 2 methods: 1) by using the tricuspid regurgitation velocity (TRV) and the time velocity integral (TVI) of the right ventricular outflow tract and calculating PVR as follows: PVR=TRV/TVI x 10+0.16 (Abbas A. JAAC 2003;41:1021-27) and 2) by calculating the three parameters: MPAp by the mean gradient method (Aduen JF Chest 2011;139:347-52), RAp by the inferior vena cava collapse and CO. Results: A significant correlation exists between ECHO and RHC obtained PVR (r=0.70 and r=0.73; p<0.0001 for methods 1 and 2 respectively). Table 1 summarizes the differences and the accuracy (within 1 WU) between the two ECHO methods. Precision is similar but the method 2 is more accurate. For an absolute value of 3 WU, positive and negative predictive values are 37 and 91% respectively. Conclusion: Method 2 is better but ECHO is not a good tool to calculate absolute value of PVR.

Echo Estimate Method	Mean difference (95 % CI)	SD of differences	Lower limit of agreements (95%CI)	Upper limit of agreements (95%CI)	Median (range) Absolute difference	No. (%) within 1 WU
Method 1	2.5 (2 to 3.1)	2.6	-2.6	7.7	2.2 (1.6 to 2.7)	28 (28 %)
Method 2	0.8 (0.3 to 1.2)	2.2	-3.5	5	0.5 (0.2 to 0.8)	56 (55 %)