Doppler Echocardiographic Pulmonary Hypertension in Correlation with Right Heart Catheterization

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Transthoracic Doppler echocardiography is recommended for screening the presence of pulmonary hypertension (PHT). However, some recent studies have suggested that pulmonary artery pressure (PAP) estimation by Doppler echocardiographic may frequently be inaccurate. Right heart catheterization (RHC) is considered the gold standard for pulmonary hypertension diagnosis. Objectives: To compare the accuracy and precision of Doppler echocardiography for estimating PAP with RHC.

Methods: We studied 29 consecutive patients (Mean age: 62.3±14.1 years, females: 25/29 - 86.2%) diagnosed with PHT by Doppler echocardiography (calculated systolic PAP>36mmHg according to tricuspid regurgitation velocity), who were referred to our center for RHC. The mean interval between echocardiography and RHC was 1.21± 1.34 months.

Results: There was a good correlation between invasive and non invasive estimation of SPAP ((Pearson rp=0.81, p<0.0001). The mean of the differences between invasive SPAP and the Doppler echocardiography was -6.07±4.13 mmHg. These differences were similar in patients with atrial fibrillation (AF) (n=11) compared to those in sinus rhythm (n=18) (-5.18±4.73 and -6.62±3.46 mmHg respectively, p=0.35).

Doppler echocardiography was inaccurate (defined as being greater than +/-10mmHg of the invasive measurement) in 13/29 (44.8%) of cases. Overestimation of SPAP by Doppler echocardiography occurred more than underestimation (10 versus 3 patients, respectively, p=0.056). Five patients (17.2%) diagnosed as PHT by Doppler echocardiography (SPAP 41-50mmHg) had normal MPAP (<25mmHg) and pulmonary vascular resistance by RHC. Conclusion: Despite the good correlation, Doppler echocardiography is frequently inaccurate in correctly estimating PAP in the individual patient. Thus, the exploration and validation of additional echocardiographic parameters or RHC is necessary to confirm the presence and severity of PHT.