Improving risk stratifcation of pulmonary hypertension patients

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Background: According to the 2016 ESC/ERS Guidelines on Pulmonary Hypertension (PH), the right atrial area (RAA) and the presence ofa pericardial effusion (PE) are the two main echocardiographic prognostic markers in PH patients (pts).

Aim: To assess the predictive ability of these two parameters.

Methods: Pts with PH were prospectively studied and several clinical/demographic/echocardiographic were retrieved as well as data from six-minute walk test (6MWT) and brain natriuretic peptide (BNP). All-cause mortality was analyzed by PE, RAA and other echocardiographic parameters for positive (PPV) and negative predictive value (NPV) to detect if the current guideline recommended cut-offs can precisely stratify risk in this setting. A survival analysis was performed to evaluate risk stratification (RS) provided by several different cut-offs.

Results: A total of 51 PH pts (mean age 54±46 years, 33.3% male, baseline BNP of 342.4±439.9pg/mL, mean 6MWT distance of 360.3±109.2 meters and baseline pulmonary artery systolic pressure of 78±26mmHg), of which 64.7% had Group I PH (GI) and 35.3% presented chronic thromboembolic pulmonary hypertension. There were no significant differences between these two groups, however pts in GI were significantly younger (p=0.001), achieved a lower 6MWT distance (p=0.038) and had worse values of right ventricular strain (p=0.040). 27 pts (52.9%) died during a mean follow-up of 52 months, with no differences between groups (p=0.756). The presence of a PE had a low NPV and PPV for the primary endpoint (45.0% and 45.5%, respectively), as well as the guideline recommended cut-offs for RAA (18cm^2: NPV- 50.0% and PPV– 55.2%; 26cm^2: NPV- 51.3% and PPV– 66.7%). A Pulsed Doppler Tei index (TIp) cut-off of 0.40 had a higher NPV (70.8%) and PPV (74.1%). By Kaplan-Meieran alysis, neither the presence of PE (log rank p=0.508) nor the recommended RAA cut-offs provided accurate risk discrimination (log rank p>0.05 for all). Pts below a TIp cut-off of 0.40 presented a significantly lower survival during follow-up (log rank p=0.002)

Conclusion: The currently recommended echocardiographic prognostic markers cannot precisely discriminate risk in PH pts. Markers of Right Ventricular Dysfunction may improve RS in this population.