

Assessment of right ventricular diastolic by tricuspid annular plane systolic excursion (TAPSE) and its prognostic value in patients with pulmonary arterial hypertension.

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Background: Complete assessment of right heart function includes assessment of the right atrial and ventricular function. Right ventricular diastolic function is difficult to assess especially in pediatric patients. TAPSE has an upstroke and a downstroke. The displacement in the upstroke is used to measure the RV systolic function. The downstroke could be utilised for assessing the right ventricular diastolic function. In this study we aimed to quantify the right ventricular diastolic function using TAPSE and establish its prognostic significance.

Materials and methods: We studied patients of PAH without shunt lesions referred to our centre. All patients underwent a detailed clinical examination, echocardiogram, Cardiac catheterization, NT pro-BNP and six minute walk test whenever feasible. Clinical deterioration was defined as death, creation of POTTS shunt or addition of prostacyclin analogues. Total right heart function was measured using TAPSE. Down-stroke in TAPSE was broken down into two components; excursion occurring from the peak of the TAPSE to the beginning of p wave on ECG (TAPSE_{RV}) and from the beginning of the p wave to the trough of TAPSE (TAPSE_{RA}). The percentage of TAPSE_{RA} (%TAPSE_{RA}) in relation to the entire TAPSE was calculated.

Results: 48 children (17F), median age 3 yrs (range 0.3-17), median BSA 0.56 m² (0.2-1.8). Echocardiogram was done on all patients at the time of initial presentation to the PAH clinic. 8 Patients underwent Potts shunt, 1 was started on iloprost and there were 6 deaths. One and 3 yr event free survival were 86 and 58% respectively. %TAPSE RA was significantly higher in patients with clinical deterioration (72±6 vs 34 ±8), p= <0.001 and correlated with higher NT-proBNP and lower 6 mins walk distance. %TAPSE_{RA} of >60% and RVFAC of <25% were independently associated with event free survival at 3 years (p= 0.02 and p = 0.03).

Conclusion: Diastolic dysfunction precedes systolic dysfunction in patients with PAH. %TAPSE_{RA} can be used as a marker of reliance on atrial contribution in maintaining cardiac output. Loss of this contribution can lead to clinical deterioration. Regular monitoring of can identify patients who are prone to clinical deterioration and escalation of therapy