**DETERMINATION OF RIGHT VENTRICULAR FUNCTION BY SYSTOLIC TO DIASTOLIC DURATION RATIO IN TETRALOGY OF FALLOT**

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**Objectives:** In this study, we explore echocardiographic metrics to determine correlation to MRI values of right ventricular dysfunction and failure.

**Background:** Progressive right ventricular failure is a common problem in patients with Tetralogy of Fallot (TOF). Monitoring right ventricular function in patients with TOF is critical aspect of care.

**Methods:**We performed a retrospective chart review that included patients with Tetralogy of Fallot who had echocardiogram and MRI within six months of either test. Systolic and diastolic duration was measured from the echocardiogram images using tricuspid regurgitation, and a ratio (SD ratio) was calculated. To control for heart rate, this observed ratio was compared to the expected ratio for a given heart rate previously described in children with no ventricular abnormalities. In addition, Tricuspid Annular Plane Systolic Excursion (TAPSE) was also evaluated. These two echocardiographic measures were correlated to MRI assessment of RV function: right ventricle ejection fraction (RVEF), left ventricle ejection fraction (LVEF), right ventricle end-diastolic volume index (RVEDV index) and right to left ventricle end diastolic volume ratio (RV/LV EDV ratio).

**Results:**45 patients were included within our study population, with 27 (60%) having TAPSE measurements available. SD ratio was positively correlated to heart rate as expected (r2 = 0.700, P < 0.0001). The ratio of observed SD ratio to expected ratio negatively correlated with RVEF (r2 = -0.359, P = 0.016), LVEF (r2 = -0.317, P = 0.038) and positively correlated with RV/LV EDV Ratio (r2 = 0.347, P = 0.024). This ratio did not significantly correlate with RVEDV index (r2 = 0.018, P = 0.907). TAPSE measurements did not show significant correlation with RVEF (r2 =0.232, P = 0.245), LVEF (r2 = 0.008, P = 0.968), RVEDV index (r2 = -0.141, P = 0.483) or RV/LV EDV ratio (r2 = 0.138, P = 0.500).

**Conclusion:** In patients with Tetralogy of Fallot, prior to their first pulmonary valve replacement, SD ratio, when adjusted for heart rate, shows a moderate negative correlation to MRI metrics of right ventricular function. The SD ratio may become a useful tool in serial echocardiograms for evaluation of right ventricular failure.