

**The pulsed Doppler and Tissue Doppler derived E/E' ratio is significantly related to invasive measurement of ventricular end-diastolic pressure (EDP) in biventricular rather than univentricular physiology in patients with congenital heart disease (CHD)**

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**OBJECTIVES:** The value of conventional non-invasive Doppler parameter to predict ventricular end-diastolic pressure (EDP) and diastolic function in congenital heart diseases is limited. The aim of our prospective study is to investigate whether the ratio of mitral early blood inflow velocity to early diastolic velocity of the mitral annulus (E/E') assessed by pulsed tissue Doppler is related to EDP in patients with different congenital heart disease (CHD) undergoing left heart catheterization.

**METHODS:** 115 hospital inpatients (64 males) with different CHD referred to cardiac catheterization were simultaneously examined by echocardiography to invasive measurement of ventricular EDP during heart catheterization. The mean age at catheterization was 8.71 years (from 3 days to 18 years). These patients were divided two groups according to the different hemodynamic and morphology: group A included the patients with biventricular heart; group B included the patients with univentricular heart.

**RESULTS:**

For all the studied patients, a significant positive correlation was found between E/E' and EDP ( $r=0.54$ ,  $P<0.001$ ). EDP correlated rather weak with combined measurements E/global LV early diastolic velocity ( $r=0.27$ ,  $P=0.02$ ). A significant relationship was also found between ventricular EDP and early mitral inflow velocity E ( $r=0.36$ ,  $P=0.001$ ). The ratio of pulmonary venous flow velocities s/d was not found to be related to invasive measured EDP ( $r= -0.16$ ,  $P=0.13$ ). Group A ( $n=96$ ) had similar result, but for group B ( $n=19$ ), these parameter did not show relationship to EDP.

The analysis for these parameters showed that the larger area under the curve (AUC) was found for the ratio of E/E' (AUC=0.77) compared with E/global E (AUC=0.57). E/E' $>10.7$  had 69% sensitivity and 81% specificity for EDP  $>10$  mmHg.

**CONCLUSION:** Doppler and tissue Doppler derived E/E' ratio is related to simultaneously invasive measurement of EDP in a heterogeneous group of CHD and may provide an important a surrogate non-invasive estimation of ventricular diastolic performance in the routine follow up of these patients, but for some kind of heart defect including univentricular heart, the correlation of E/E' ratio and EDP should be considered carefully.