Non-Invasive Measurement of Left Ventricular End-Diastolic Pressure by Color M-Mode Echocardiography and Doppler Pre-Ejection Flow Wave Velocity

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Background --- The pre-ejection flow wave seen on Doppler study of the left ventricular (LV) outflow tract as described in previous study and the information obtained from the color M-mode propagation velocity of the transmitral flow have been suggested as indexes of ventricular relaxation. We sought to determine the applicability of combined information obtained from LVOT pre-ejection velocity and color M-mode flow propagation velocities in estimating Left Ventricular End Diastolic Pressure (LVEDP).

Method --- This is a prospective study involving seventy five patients in sinus rhythm with adequate systolic function who underwent Doppler measurement of pre-ejection wave and propagation velocity by color M-mode followed by LVEDP determination by cardiac catheterization. Validity measures were determined. A p value <0.05 was considered significant.

Results --- Of the echocardiographic parameters, the ratio of the E/Vp (Mitral E wave/flow propagation velocity) and LVOT(left ventricular outflow tract) pre ejection wave significantly correlated with LVEDP. Furthermore, the pre ejection wave of > 0.3 accurately predicts the presence of elevated LVEDP compared with an E/Vp ratio of > 1.5. (sensitivity 87 % vs 54%, specificity of 70% vs 63%, positive predictive value of 65% vs 51%, and negative predictive value of 88% vs. 66%.

Conclusion --- An elevation in pre-ejection wave is associated with elevated LVEDP and is comparable to the ratio of transmitral flow and color M-mode flow propagation velocity (E/Vp). ***Phil Heart Center J 2012;16:80.***