Utility of new Doppler parameters connected with elevated left ventricle end-diastolic pressure for identification of mitral inflow pseudonormalization.

K. Wierzbowska, J. Drozdz, J.D. Kasprzak, M. Krzeminska-Pakula. Medical University of Lodz, Cardiology Dept., Lodz, Poland

The occurrence of mitral inflow pseudonormalization imposes some difficulties on classification of diastolic function (DF). Our aim was to assess if a new parameters proposed as a noninvasive measurement of filling pressure, ratios of peak early wave velocity to early propagation velocity (E/Ep) and peak early wave velocity to early diastolic motion of mitral anulus (E/E'), can help in differentiation of normal (N) and pseudonormal (PN) mitral inflow.

Purpose: We compared E/Ep and E/E' ratios and other echocardiographic parameters between patients (pts) with normal (N) and pseudonormal (PN) mitral inflow, performed ROC analysis for detection of optimal cut-off values and assessed diagnostic value of this parameters for detection of pseudonormalization.

Methods: Among 120 pts with coronary artery disease and 60 healthy persons examined by transthoracic echocardiography with assessment of diastolic function we selected the subgroups with E/A ratio between 1 and 2, and divided them into N and PN mitral inflow group according to E wave deceleration time. Propagation velocity was measured by color M-mode and tissue Doppler parameters were assessed in lateral segment of mitral annulus. Than we compared 15 pts with PN (mean age 57±11, male) and 54 persons with N pattern (mean age 55±9, male).

Results: In N group E/Ep and E/E' ratios were lower than in PN group (1,7±0,4 vs 3,5±1,3 for E/Ep and 6,3±2,1 vs 9±3,7 for E/E'; p<0,001).

Conclusion: Both E/Ep and E/E' ratios are useful for differentiation of PN and N pattern. In our group of pts diagnostic value of E/E' ratio was highly significant, greater than E/Ep ratio, comparable with enlarged LA diameter and slightly better than value of pulmonary flow parameters.

Isovolumic index and left atrial and ventricular filling in patients right and left ventricular total ejection with chronic obstructive lung disease.

G.M.A. Nasr, Mahmoud El Prince, Khalil A. Khilali. Suez Canal Hospital, Cardiology, Ismailia, Egypt

Background: Abnormal left ventricular (LV) diastolic function has frequently been reported in patients with chronic obstructive pulmonary disease (COPD). There are very few data regarding left atrial and ventricular filling in patients with COPD.

Methods: In the present work we studied 40 patients with COPD clinically stable and without history of heart disease and 40 control subjects. Right and left ventricular diastolic & systolic diameters, Left ventricular mass index, Ejection fraction, E velocity, A velocity, E/A ratio were determined. Diastolic function was also studied by a combined analysis of pulmonary venous and mitral blood flow velocities. Estimations of LA pressure were obtained from the comparison of mitral and pulmonary venous flow velocities Isovolumetric relaxation time (IRT), isovolumetric contraction time (ICT), ejection time (ET) and the combined index of myocardial performance (Total isovolumic ejection index = IRT + ICT + ET), were calculated by echocardiography Doppler for both the right and left ventricle. Contribution of the atrial contraction to the total filling in COPD patients in comparison with control subjects was also assessed.

Results: The increased contribution of the atrial contraction to the LV filling in COPD patients in comparison with control subjects was confirmed; furthermore, a decreased left atrial (LA) filling during the ventricular systole was observed. Changes in LV filling were not the consequence of a systolic dysfunction based on the ejection fraction because as it was normal. However the combined myocardial diastolic performance unmasked presence of both left and right ventricular dysfunction. Doppler indices indicated that LA pressure was below 15 cm H2O in all the patients with COPD and control subjects.

Conclusion: Analysis of Doppler transmural and pulmonary venous flows demonstrated the role of the ventricular interdependence because a correlation existed between LA and LV filling pattern and right ventricle pressure and diameter. Total isovolumic ejection time index could be a sensitive index for detecting early changes in both right and left ventricular combined performance in COPD patients. We strongly advocate the use of noninvasive indicators of right ventricular performance in patients with pulmonary disease as a means of identifying those at high risk. This new echocardiographic technique can be incorporated into a conventional transthoracic study.