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 Doppler parameters 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 annulus (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 subgroup 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 9.1±3.7 for E/E', p<0.001).

For cut-off values of E/Ep above 2.3 and of E/E' above 8.2, sensitivity, specificity, positive predictive value, negative predictive value and accuracy for detection of PN were respectively: 87, 91, 72, 96, 90% and 60, 81, 47, 88, 77%.

Area under ROC curve (AUC) for E/Ep= 0.921 was comparable with this for left atrium (LA) diameter (0.963) and was higher than AUC for parameters of pulmonary vein flow (0.814 for atrial reversal time and 0.779 for the difference of atrial reversal time and atrial wave duration of mitral inflow).

Conclusions: 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.

125 Correlation of left ventricular ejection fraction and systolic tissue Doppler velocities with parameters of diastolic function.

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

Background: Tightly connected with systolic performance elastic recoil is postulated as an important determinant of early filling. In spite of wide coexistence of diastolic dysfunction in patients (pts) with systolic impairment, correlations between systolic and diastolic parameters are not sufficiently examined.

Purpose: Our aim was to calculate correlations between systolic variables: ejection fraction (EF) and systolic velocity of mitral annulus (m. a.) motion and comprehensive spectrum of diastolic parameters of left ventricle.

Methods: We performed transthoracic echocardiography with assessment of mitral inflow, pulmonary vein flow, propagation of early mitral and atrial wave in color Doppler M-mode and pulsed TDE spectrum of m. a. motion and comprehensive spectrum of diastolic parameters of left ventricle.

Results: We found significant positive correlation between EF and early propagation velocity (E/Ep; r=0.68) and systolic velocity of pulmonary vein flow (S; r=0.46).

Conclusions: Contrary to classic mitral inflow inflow parameters velocity of mitral E wave propagation correlated significantly with systolic function. It seems that impairment of elastic recoil or asynchrony of diastolic motion in pts with contractility impairment may influence early filling decreasing especially early propagation velocity.

126 Gender-related differences of diastolic function in normal subjects and patients with coronary artery disease.

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

Background: Recent studies indicated on some gender-related differences in diastolic filling in hypertension. Wide spectrum of new Doppler methods and parameters encourage the reexamination of impact of gender on left ventricle diastolic function in other group of patients (pts).

Purpose: Our aim was to study if comprehensive assessment of diastolic function detects any difference between normal male and female subjects and pts with angiographically proved CAD with normal ejection fraction.

Methods: We examined 127 subjects: 70 male (34 healthy and 36 with CAD) and 57 female (33 healthy) by transthoracic echocardiography with assessment of classic mitral and pulmonary veins flow, propagation of mitral waves and tissue Doppler variables of mitral annulus motion (TDE). Male (M) and female (F) group were paired with regard to age, heart rate and medical treatment. We compared separately healthy (34 M: mean age 51±13, and 33 F: mean age 53±11) and CAD group (36 M: mean age 56±10 and 24 F: mean age 60±10).

Results: Among classic diastolic parameters in healthy subjects velocity of early wave of mitral inflow (E) and systolic wave of pulmonary vein flow (S) were significantly higher in F: (respectively 77±18 vs 65±19 cm/s and 64±14 vs 57±11 cm/s; p<0.05). Among propagation parameters atrial wave propagation velocity (Ap) was lower in F: (43±12 vs 50±12 cm/s; p=0.05), early propagation to atrial propagation ratio (Ap/Ap) was higher in F: (1.0±0.5 vs 1.3±0.5; p<0.05). Analysis of TDE showed higher values of atrial (A) and systolic (S') velocities of mitral annulus (m. a.) in M: (13±2 vs 12±2 cm/s and 11±2 vs 10±2 cm/s; p<0.05) and higher early inflow velocity to early annulus velocity ratio (E/Ep) in F: (7.1±2 vs 5.9±1.5; p<0.01) for parameters calculated from six points of m. a. For lateral segment of m. a. only E/E' ratio was higher in F: (6.7±2.6 vs 5.1±1.4; p<0.01).

In all groups of males we observed higher E/A ratio in M: (1.1±0.5 vs 0.8±0.2; p<0.05), atrial inflow velocity (Av) and atrial velocity to atrial propagation ratio (Av/Ap) in F: (78±24 vs 64±17 cm/s; p<0.007 and 1.6±0.5 and 1.3±0.5; p<0.05, respectively). 

Conclusions: Our results suggest gender-related differences of diastolic function in healthy men in comparison to aged-matched women and opposite relationship in patients CAD. Contrary TDE velocities showed trend to lower values in healthy women and the strongest statistical significance was shown for higher E/E' ratio in F.