Background: Abnormalities in diastolic function are considered to be an early sign of diabetic (DM) cardiomyopathy in patients without systolic ventricular dysfunction. Echocardiography with Doppler measurements of transmural and transtissuecudal flow, together with myocardial tissue Doppler (TDI), Strain, and Strain rate (SR) are means to evaluate diastolic function noninvasively.

Aim of study: To compare left (LV) and right (RV) ventricular systolic and diastolic function, assessed by conventional echocardiography and by DTI and atrial function assessed by S and SR, in DM patients without coronary artery disease (CAD) and non-diabetic subjects.

Methods: We studied 30 subjects: 15 diabetic patients (7 M, 8 F, mean age: 54 years) without CAD, assessed by negative coronary angiography or myocardial scintigraphy and 15 controls. By Echocardiography System Seven GE equipped with TVI function we studied LV and RV systolic and diastolic function, pulmonary artery wedge pressure (PCWP), calculated by E/EA and left and right atrial (LA/RA) peak systolic tissue S and SR in 4 and 2 chambers, respectively, at the segment of the septal, lateral, anterior and inferior LA walls, and RA free wall. We studied by Pulsed Doppler and DTI early (E) and late (A) diastolic wave velocity, ratio E/A, deceleration time (DT), left and right isovolumic relaxation time (IVRT) and Pulsed Doppler of pulmonary venous flow.

Results: There were differences in flow parameters: DM patients had significantly higher prevalences of abnormal diastolic mitral (ratio E/A=0.83 vs 1.4, p<0.001), tricuspid (ratio E/A=0.85 vs 1.4) flow patterns than the non-diabetic patients and a significantly longer mitral valve DT (245 versus 195 msec).

LA/RA S and SR were found to be significantly (p=0.002) lower for diabetic patients and a significantly longer mitral valve DT (245 versus 195 msec).

Conclusions: LA/RA S and SR are compromised in DM patients. Left and right diastolic function abnormalities in DM population with normal systolic function, without complications, hypertenion and CAD, has been suggested as an earliest functional effect of a specific DM cardiomyopathy. Thus, diabetic LV and RV function in DM population are impaired independently of CAD.

The influence of left atrial volume and function on doppler transmural flow pattern in patients with primary dilated cardiomyopathy

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