ASSESMENT OF LEFT VENTRICULAR FUNCTIONS IN PATIENTS WITH TYPE 2 DIABETES MELLITUS USING TISSUE DOPPLER IMAGING (TDI) AND ITS CORRELATION WITH A NOVEL CARDIAC BIOMARKER

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Abstract

Introduction :

Cardiovascular diseases account for about 65% of diabetes – related mortality. Our study aimed at non – invasive assessment of left ventricular functions in asymptomatic type 2 diabetics using echo- heart and tissue Doppler imaging which are relatively inexpensive diagnostic tool for detecting structural and functional cardiac abnormalities and correlating them with levels of BNP hormone.

Methods:

we studied 55 patients with type 2 diabetes classified into 2 groups: 26 with less than 10 years diabetes duration and 29 patients with more than 10 years duration.

All included patients were subjected to full history, FBG, PPBG, HbA1c, creatinine, lipid profile, BNP , E.C.G, conventional echo and Tissue Doppler Imaging.

Data analysed using Microsoft Office 2003 and(SPSS) version 16,correlation coefficient to determine relation between 2 studied parameters.

Results:

45 patients (80%) out of 55 patients have diastolic dysfunction; classified as: 15(27%) patients have type 1 diastolic dysfunction, 26 (47%) patients have type 2 pseudo- normal diastolic dysfunction, 4 (7%) patients have type 3 diastolic dysfunction .Systolic dysfunction (i.e EF < 55) was present in 9patients (16%) despite absence of heart failure. BNP was significantly high in patients with longer diabetes duration (P- 0.008). Also there was statistically significant difference in the BNP level between those with diminished systolic function compared to those with normal systolic function (EF > 55) with p- value 0.001, yet no statistically significant difference was found between BNP and different groups of diastolic dysfunction(P-0.7).

Conclusion :

diabetic cardiomyopathy (DbCM) is an important but less well- recognized complication of diabetes; its manifestations can vary from subclinical ventricular dysfunction to overt heart failure. Echocardiography is the standard clinical diagnostic tool for DbCM at present. TDI can be

used to quantitatively assess global and regional systolic and diastolic functions of the myocardium .various plasma markers like BNP can be used with prognostic rather than diagnostic value.

Key Words: cardiomyopathy , BNP ,diastolic dysfunction, diabetes mellitus.

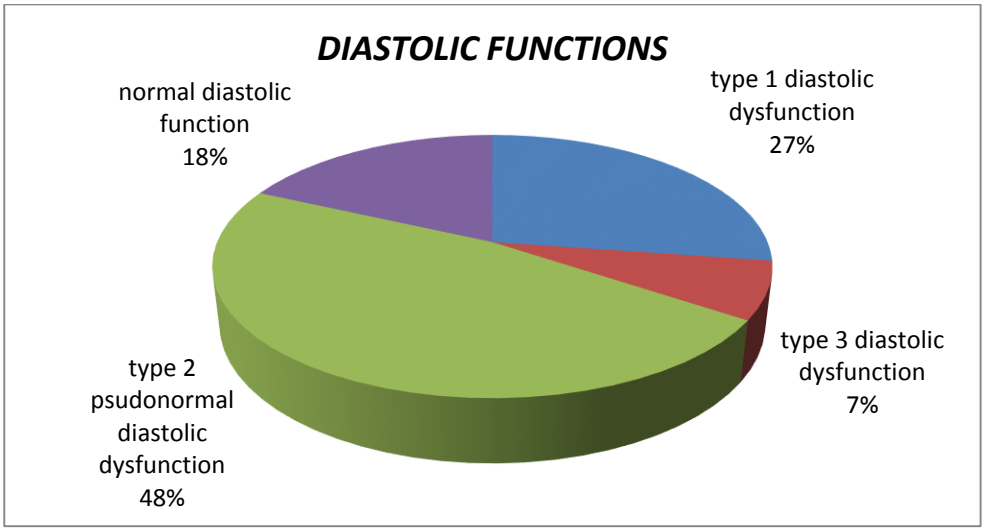

Figure (1) Diastolic functions in all patients

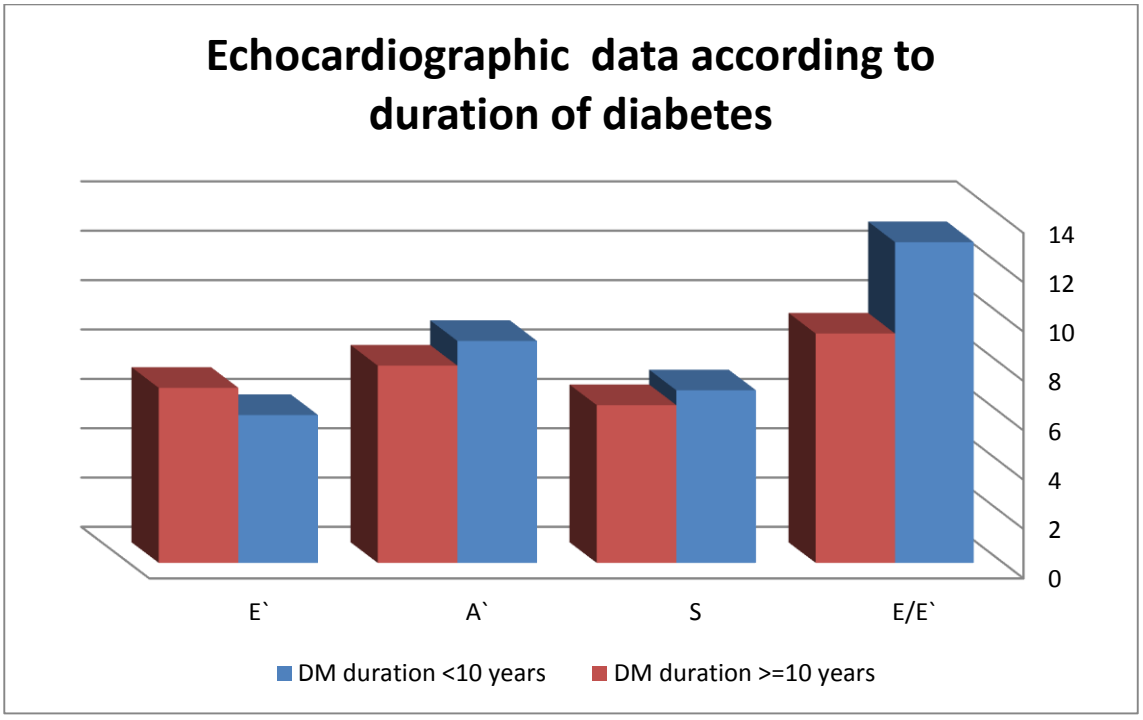

Figure (2) comparison of Echocardiographic data according to duration of diabetes

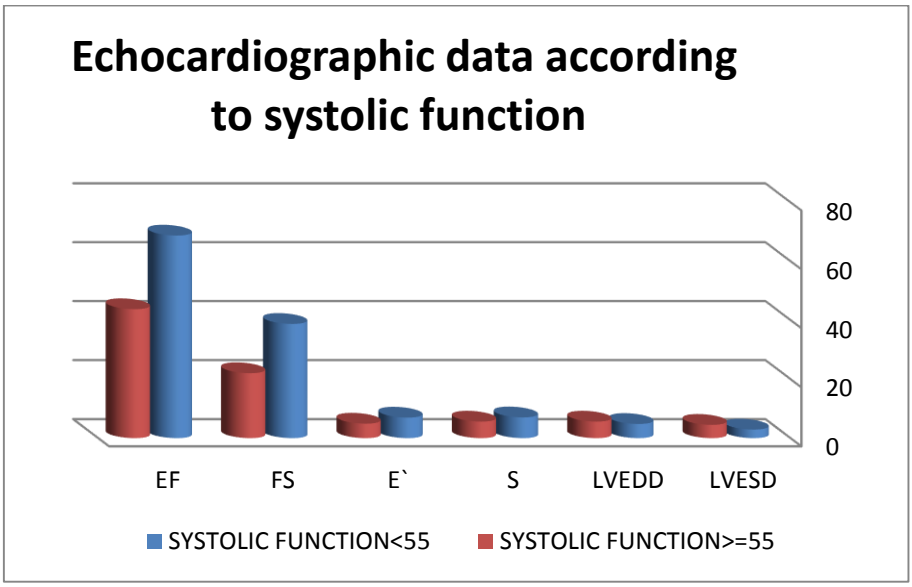

Figure (3) comparison of Echocardiographic data according to systolic function

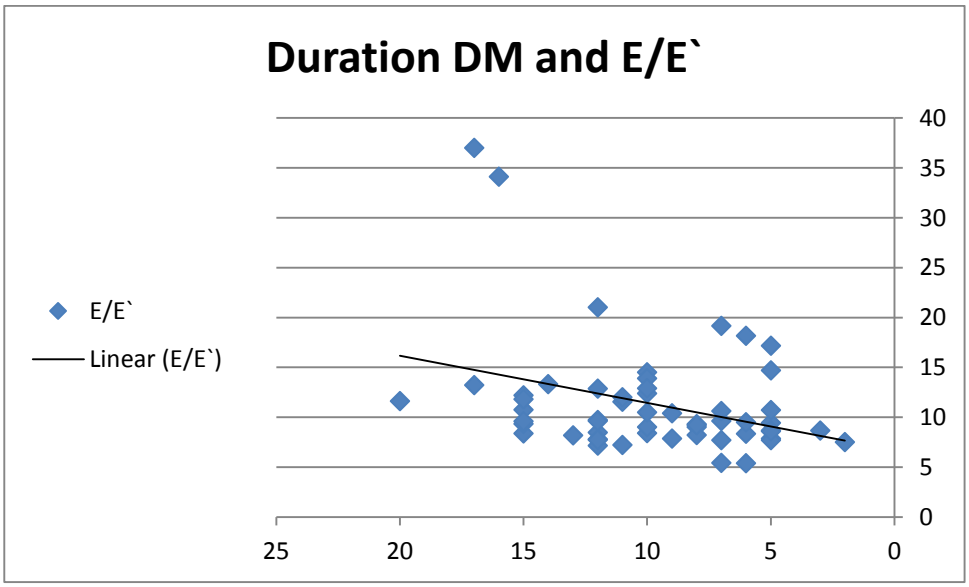

Figure (4) Positive correlation between DM duration and E/E' ratio (which represents left ventricular end diastolic pressure)

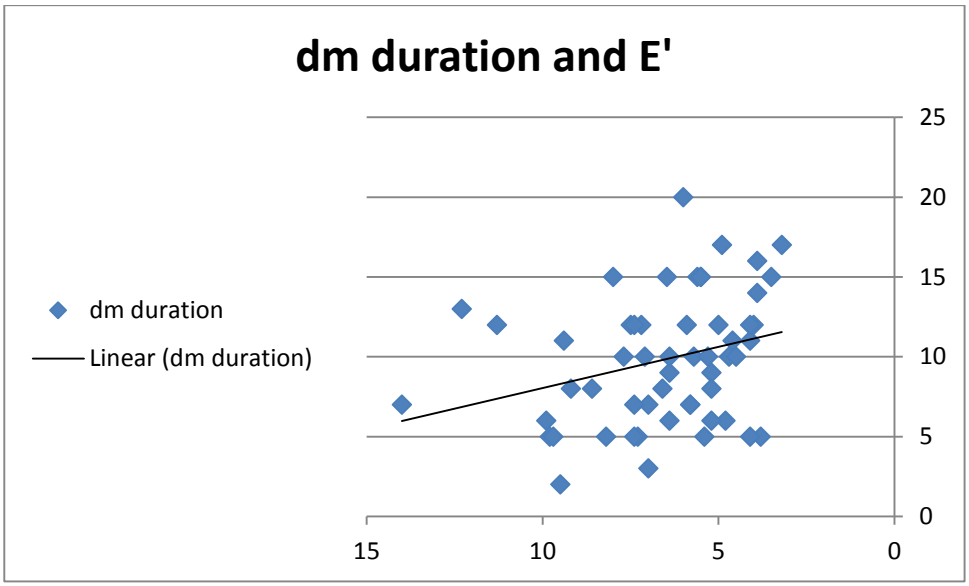

Figure (5) Negative correlation between DM duration and E' (which represents early diastolic phase)

The E/E` ratio which represents left ventricular end diastolic pressure ranged from 5.3:38.4 cm/s with a mean of 11.3±6.1, S which represents systolic forward flow , ranged from 4.3:9.8 cm/s with a mean of 6.7±1.3 , A' which represents late diastolic phase , ranged from 5.4:11.2 cm/s with a mean of 8.5±1.4, E' which represents early diastolic phase, ranged from 3.20:14 cm/s with a mean of 6.5±2.2, E which represents early filling velocity , ranged from 39 to 134 cm/s with a mean of 66.3±2, EF% ranged from 34 to 80% with a mean of 63.6±1.1, FS% ranged from 16.7 to 48.6% with a mean of 35±8.2, LVESD ranged from 3.5 to 6.7 cm with a mean of 3.2±0.7, LVEDD ranged from 3.5 to 6.7 cm with a mean of 5±0.6