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DIASTOLIC DYSFUNCTION IN CASES WITH TYPE II DIABETES MELLITUS.

1. MBBS, FCPS
Senior Registrar
Department of Medicine
Muhammad Medical College
Mirpurkhas.
2. MBBS, FCPS
Senior Registrar
Department of Medicine
Khairpur Medical College Khairpur.
3. MBBS, FCPS
Assistant Professor
Department of Obstetrics and Gynecology
Shaheed Motharma Benazir Bhutto Medical College Liyari Karachi.
4. MBBS, DMJ
Assistant Professor
Department of Forensic Medicine
Khairpur Medical College Khairpur.
5. MBBS
Medical Officer
Department of Medicine
Khairpur Medical College Khairpur.

Correspondence Address:
Dr. Munir Ahmed
Noor Clinic and Maternity Home,
Mirzapur Mohalla Kandhkot
District Kandhkot Sindh.
drmunirchanna@yahoo.com

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Munir Ahmed Channa[1], Abdul Hayee[2], Shahla Afsheen[3], Ismail Salim Memon[4], Abdul Qayoom Memon[5]

ABSTRACT… Objectives: To determine the frequency of diastolic dysfunction in patients presenting with type II Diabetes Mellitus. **Study Design:** Cross sectional study. **Setting:** Sheikh Zayed Hospital, Rahim Yar Khan. **Period:** From 01-01-2017 to 30-06-2017. **Material & Methods:** In this study the cases were selected via non probability consecutive sampling of both male and female gender with age more than 40 years having type II DM of at least more than 2 years were included. The cases suffering from type I DM, gestational DM and those with HTN, end stage kidney and liver failure were excluded. Trans thoracic echocardiography was done to label diastolic dysfunction and was labelled as yes when the E/A ratio was <0.8. The data was analysed using chi square test and p value less than 0.05 was taken as significant. **Results:** In this study, 100 cases of type II DM were included with mean age of 51.31±7.89 years at presentation. There were 61% males and 39% females. Diastolic dysfunction was observed in 53% of the cases. There was no significant difference in terms of gender where it affected 56.41% of females with p= 0.92. Diastolic dysfunction was more in cases that had duration of DM more than 3 years affecting 48 (70.58%) cases with p= 0.001 and it was also significantly high in cases that had BMI more than 30 where it was seen in 40 (70.17%) of cases with p= 0.001. **Conclusion:** Diastolic dysfunction seen in half of the cases suffering from type II DM and it is significantly high in cases that had duration of DM more than 3 years and BMI more than 30.

Key words: BMI, Diastolic Dysfunction, Type II Diabetes Mellitus

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INTRODUCTION

Diabetes Mellitus (DM) is one of the highest prevalent metabolic syndrome worldwide and its number is highest in the developed world. It has two major types i.e. type I and type II DM depending upon the time of onset and insulin deficiency and resistance pattern. The data is lacking in the developing countries, but scarce findings revealed that the number is increasing gradually attributed to change in the life style.[1,2]

Diabetes Mellitus leads to chronic hyperglycemic levels that can affect the body in various ways when uncontrolled. It can virtually involve any part of the body and the complications are majorly sub divided into micro and macro-vascularbased due to underlying atherosclerosis of the blood vessels. Cardiovascular system (CVS) can be affected most in cases with un-controlled DM, that can further increase the symptomatology in such cases.[2,3] Cardiac complications include acute coronary syndromes, cardiac arrhythmias, systolic and diastolic dysfunctions, cardiomyopathy etc. The data has revealed that around 65% of the cases suffering from DM die due to an insulting cardiac event.[4-6]

Diastolic dysfunction is under extensive discussion in the recent times and seems to effect earlier as compared to the systolic dysfunction. Electrocardiogram (ECG) is non-specific for detection of this and trans thoracic echocardiography is the tool of choice and E/A ratio is indicative to label diastolic dysfunction.[7-9] Sharavanan et al, in their study, irrespective of the type of DM carried echo to look for diastolic dysfunction and it was seen in 55% of cases.[8] In other studies done by Sridevi& Dikshit et al, found this in 65-80% of the cases suffering from DM.[6] Systolic dysfunction is still being the most

studied in the under developed countries; that's why this study was planned to document the burden of the diastolic dysfunction in such cases so that further steps can be taken to early predict and manage such cases.

MATERIALS AND METHODS

This cross sectional study was carried out at Sheikh Zayed Hospital, Rahim Yar Khan during 01-01-2017 to 30-06-2017. In this study the cases were selected via non probability consecutive sampling. The cases of both male and female gender with age more than 40 years having type II DM of at least more than 2 years were included. The cases suffering from type I DM, gestational DM and those with HTN, end stage kidney and liver failure were excluded. The cases were selected from the medical out-patient department and were sent for trans thoracic echocardiography to the Cardiology department of the same institute and the echo was done by a consultant cardiologist with at least more than 1 year experience post fellowship. On echocardiography, the diastolic dysfunction was labelled as yes when the E/A ratio was <0.8. The data was analysed using SPSS version 22. The numerical data was presented as mean and standard deviation whiles the categorical data as frequencies and percentages. The effect modifiers like age, gender and BMI were controlled through stratification and post stratification chi-square test was applied taking p value < 0.05 as significant.

RESULTS

In this study, 100 cases of type II DM were included with mean age of 51.31±7.89 years at presentation. There were 61% males and 39% females. Diastolic dysfunction was observed in 53% of the cases (Figure-1). There was no significant difference in terms of gender where it affected 56.41% of females with p= 0.92 as in Table-I. Diastolic dysfunction was more in cases that had duration of DM more than 3 years affecting 70.58% cases Table-II with p= 0.001 and it was also significantly high in cases that had BMI more than 30 where it was seen in 70.17% of cases with p= 0.001 as displayed in Table-III.

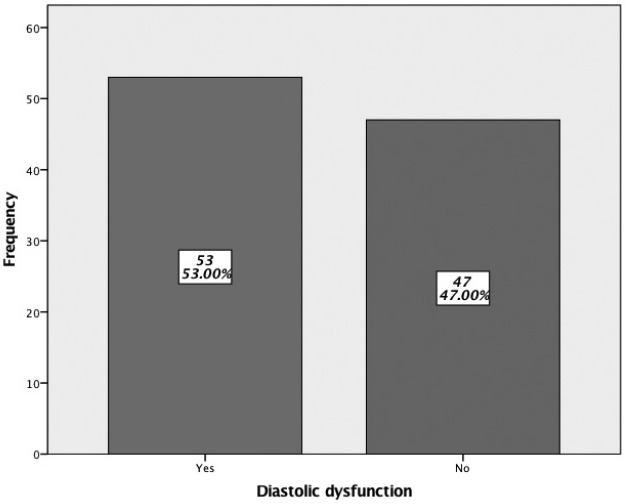

Figure-1. Diastolic dysfunction

Gender	Diastolic Dysfunction		Total	P-Value
	Yes	No		
Male	31 (50.81%)	30 (49.19%)	61 (100%)	
Female	22 (56.41%)	17 (43.59%)	39 (100%)	0.092
Total	53(53%)	47 (47%)	100 (100%)	

Table-I. Diastolic dysfunction and gender

Duration of DM	Diastolic Dysfunction		Total	P-Value
	Yes	No		
> 3 years	48 (70.58%)	20 (29.42%)	68 (100%)	
3 or less	5 (15.62%)	27 (84.38%)	32 (100%)	0.001
Total	53(53%)	47 (47%)	100 (100%)	

Table-II. Diastolic dysfunction and length of DM

BMI	Diastolic Dysfunction		Total	P-Value
	Yes	No		
> 30	40 (70.17%)	17 (29.83%)	57 (100%)	> 30
<30	13 (30.23%)	30 (69.77%)	43 (100%)	<30
Total	53(53%)	47 (47%)	100 (100%)	Total

Table-III. Diastolic dysfunction and BMI

DISCUSSION

Type II Diabetes Mellitus is caused by the resistance of the tissue to the produced insulin and lead to chronic hyper glycaemia and decreased uptake of the glucose by the cells. This persistent hyper

glycaemia lead to wide range of complications in the cardiovascular system due to atherosclerosis and cardiomyopathies.[9,10]

In the present study Diastolic dysfunction (DD) was seen in 53% of cases having type II DM. This results were close the previous studies carried out on cases of DM. Sharanavan et al, carried out a similar study and it was seen that this dysfunction was seen in 66 (55%) cases in their study.[10] The study by Patil et al also strengthened the results of the present study, where they found54.33% of their cases having DM to be affected by Diastolic dysfunction.[11]

In the present study DD was seen significantly high in cases that had BMI more than 30 where it was seen in 70.17% of cases with p= 0.001.The data from the previous studies have also shown that the high BMI is an independent risk factor to develop diastolic dysfunction.[12,13] Germing A et al carried out a case control trial to look for DD in cases with and without DM and it was seen that this was significantly high in cases that had DM ($p<0.05$).[14] Russo, et al in another study also found this to be significantly associated with not only DM but also found a positive correlation between the length of DM and diastolic dysfunction.[15]

Diastolic dysfunction was also seen significantly in cases that had duration of DM more than 3 years affecting 70.58% cases with p= 0.001. This finding was consistent with the study by Kumar et al; although they did not use the same cut off value, but it was seen that the cases with longer duration of DM has significantly high diastolic dysfunction with p value of 0.03.[16]

There were few limitations of this study as this study did not look for other confounding variables like HTN, Dyslipidemias and family history of cardiac disorders.

CONCLUSION

Diastolic dysfunction seen in half of the cases suffering from type II DM and it is significantly high in cases that had duration of DM more than 3 years and BMI more than 30.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Munir Ahmed Channa	Data collcetion and retionable setting, Plagiarism setting.	
2	Abdul Hayee	Data collection and Methodology setting.	
3	Shahla Afsheen	Discussion writing.	
4	Ismail Salim Memon	References setting, searching of literature and review of manuscript.	
5	Abdul Qayoom Memon	Introeudtion writing and Abstract writing.