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Research Article

**DIASTOLIC DYSFUNCTION IN CASES OF DM**<sup>1</sup>Waleed Muhammad Ayoub, <sup>2</sup>Muhammad Nabeel Ahmad, <sup>3</sup>Muhammad Usman.

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**Abstract****Objective:**

To determine the frequency of diastolic dysfunction in cases of diabetes mellitus.

**Methodology:** This was a descriptive case series conducted at PIMS hospital, Islamabad during January 2019 to June 2019. In the present study the cases of either gender with age range of 30 years or more with history of DM of at least 1 years were included. The cases with ischemic heart disease, end stage renal or liver disease were excluded. Diastolic dysfunction was labelled as yes when on trans thoracic echocardiography the E/A ratio was less than 0.8. **Results:** In the present study there were total 100 cases of DM. Out of these 53 (53%) were males and 47 (47%) were females. The mean age of the cases was  $51.35 \pm 8.67$  and mean duration of DM was  $5.15 \pm 2.23$  years. Diastolic dysfunction was seen in 54 (54%) of the cases. Diastolic dysfunction was seen in 22 (73.33%) of cases with  $p=0.01$ . This was also seen significantly high in cases that had BMI more than 30 where it was seen in 26 (68.42%) of cases with  $p=0.04$ .

**Conclusion:** Diastolic dysfunction is common in cases of DM and it is significantly associated with HTN and obesity.

**Key words:** DM, Diastolic dysfunction

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**INTRODUCTION:**

Diabetes Mellitus (DM) is one of the chronic diseases and its number is increasing specially in the developing countries in the recent times. It is defined as syndrome of metabolic disorders resulting in the phenotype of hyperglycemia. It has two sub types i.e. Type I and type II DM. [1]

The underlying pathophysiology to lead towards various complications especially the cardiac is diverse and it includes chronic hyperglycemia, atherosclerosis and ongoing narrowing to the coronary vessels leading to ischemia. The data has shown that there is increased risk of congestive heart failure in such cases which can either be systolic or diastolic. According to a study more than 70% of the cases with diabetes mellitus due to a cardiovascular disease. [2-3]

Echocardiography is considered as the diagnostic modality which is most widely used and is the investigation of choice to label systolic and diastolic dysfunction. [4-5]

According to a study by Sharavanan TKV et al the diastolic dysfunction in cases of DM was seen in only 55% of cases. [6] According to another study by Dikshit NM et al the diastolic dysfunction in cases of DM was seen in 66% of the cases. [7] While study by Sridevi et al the left ventricular diastolic dysfunction was seen in as high as 79% of the cases. [5]

**Objective:**

To determine the frequency of diastolic dysfunction in cases of DM.

**MATERIALS AND METHODS:****Study settings;**

Cross sectional study

**Study place;**

PIMS hospital, Islamabad

**Study duration;**

January 2019 to June 2019

**Sampling technique;**

Non probability consecutive sampling

In the present study the cases of either gender with age range of 30 years or more with history of DM of at least 1 years were included. The cases with ischemic heart disease, end stage renal or liver disease were excluded. Diastolic dysfunction was labeled as yes when on trans thoracic echocardiography the E/A ratio was less than 0.8.

**Statistical analysis;**

The data was entered and analysed by using SPSS version 22. Effect modifiers were controlled through stratification and Post stratification chi square test was applied taking p value < 0.05 as significant.

**RESULTS:**

In the present study there were total 100 cases of DM. Out of these 53 (53%) were males and 47 (47%) were females. The mean age of the cases was  $51.35 \pm 8.67$  and mean duration of DM was  $5.15 \pm 2.23$  years. Diastolic dysfunction was seen in 54 (54%) of the cases. Diastolic dysfunction was seen in 22 (73.33%) of cases with  $p=0.01$  as in table 1. This was also seen significantly high in cases that had BMI more than 30 where it was seen in 26 (68.42%) of cases with  $p=0.04$  as in table 02.

**Table 1. Diastolic dysfunction with respect to HTN**

HTN	Diastolic dysfunction		Total	p value
	Yes	No		
Yes	22 (73.33%)	08 (26.67%)	30 (100%)	0.01
No	32 (45.71%)	38 (54.29%)	70 (100%)	
<b>Total</b>	<b>54 (54%)</b>	<b>46 (46%)</b>	<b>100 (100%)</b>	

**Table 2. Diastolic dysfunction with respect to obesity**

BMI	Diastolic dysfunction		Total	p value
	Yes	No		
> 30	26 (68.42%)	12 (31.58%)	38 (100%)	0.04
30 or less	28 (45.16%)	24 (54.86%)	62 (100%)	
<b>Total</b>	<b>54 (54%)</b>	<b>46 (46%)</b>	<b>100 (100%)</b>	

**DISCUSSION:**

Diabetes mellitus is a clinical syndrome and can result in various cardiovascular diseases. A part from the systolic dysfunctions, diastolic dysfunctions are under extensive discussion in the recent times and have shown variable correlation with DM.

In the present study the diastolic dysfunction was observed in 54 (54%) of cases. In a study by Sharanavan et al this dysfunction was seen in 66 (55%) of the cases. [6] While in another study done by Patil et al, this finding was seen in 54.33% of the cases in their study. [8]

Diastolic dysfunction was seen significantly high in cases that had BMI more than 30 where it was seen in 26 (68.42%) of cases with  $p=0.04$ . This result was similar to the previous studies where it was seen that the obesity was single independent variable to prone for diastolic dysfunction as compared to non diabetics. According to a study done by Alfried et al, the diastolic dysfunction was significantly high in cases that were observed with p value less than 0.05 [9-10]

In another study by Russo, et al, they checked the association of obesity and left ventricular diastolic dysfunction and it was seen that there was a strong correlation between these two. [10]

Diastolic dysfunction was seen in 22 (73.33%) of cases with  $p=0.01$ . These findings were similar to the studies done in the past, according to a study done by Abhay Kumar et al there was significant association of HTN with diastolic dysfunction with p value of 0.03. [11]

**CONCLUSION:**

Diastolic dysfunction is common in cases of DM and it is significantly associated with HTN and obesity.

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