



## TYPE II DIABETES MELLITUS AND DIASTOLIC DYSFUNCTION; 100 CASES

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### ABSTRACT

**Objective;** Frequency of diastolic dysfunction in patients having type II DM **Methodology;** This was a cross sectional study that was conducted at Medical department of Sheikh Zayed Hospital, Rahim Yar Khan during May to October 2017. In this study 100 cases were selected via non probability consecutive sampling irrespective of gender and having age group of 35 to 70 years with history of type II DM lasting for at least 2 years. Diastolic dysfunction was labeled on echocardiography and where E/A ratio of less than 0.8 was labelled as yes. **Results;** In this study, there were 100 cases of type II DM. The mean age of the participants was  $54.12 \pm 7.56$  years. There were total 56 (56%) males and mean duration of DM was  $7.78 \pm 2.23$  years. Diastolic dysfunction was seen in 50 (50%) of the cases. there was no significant difference in terms of gender and different age groups with p values of 0.92 and 0.51 respectively. Diastolic dysfunction was seen significantly high in cases that had Type II DM for more than 5 years affecting 39 (54.92%) cases as compared to 11 (37.93%) cases with duration less than this with p value of 0.02. **Conclusion;** Diastolic dysfunction is very common and is seen in every other cases of Type II DM and is significantly high in cases with duration of DM for more than 5 years.

**KEYWORDS:** Type II DM, Diastolic dysfunction, Echocardiography.

### INTRODUCTION

Life style changes are on the rise in the developing countries and western life style had led to emergence of the new complications like Diabetes Mellitus (DM) which is a spectrum of clinical signs and symptoms and virtually can damage any organ of the body if uncontrolled. There are two sub-types i.e. Type I and Type II DM where former is by birth or of adolescence age due to lack of insulin while the latter due to resistance of the body or receptors to the insulin.<sup>[1]</sup>

There are a number of changes that are seen in the body over the years due to DM and none of the organ is spare from this. Atherosclerotic changes of the vessels and high viscosity of the fluid due to increased glucose levels are amongst the major underlying pathophysiological changes that are seen in such cases to lead micro and macro vascular changes.<sup>[2-3]</sup>

Cardiovascular system can be affected in many ways as well. Atherosclerosis and vessel narrowing leading to ischemia and heart failure is one entity and the diastolic dysfunction (DD) is the other common but under rated complication. A survey had shown that > 70% of the cardiac diseases are due to atherosclerosis. Electrocardiography is done initially to rule out the other possible complications while echocardiography is

considered as choice of investigation.<sup>[4-5]</sup> The data has revealed its prevalence of around 30-80% in cases of type II DM. According to a study by Sharavanan TKV et al, this was seen in 55% of cases while in another it was noted in 66-79% of the cases.<sup>[5]</sup>

### OBJECTIVE

Frequency of diastolic dysfunction in patients having type II DM.

### MATERIALS AND METHODS

This was a cross sectional study that was conducted at Medical department of Sheikh Zayed Hospital, Rahim Yar Khan during May to October 2017. In this study 100 cases were selected via non probability consecutive sampling irrespective of gender and having age group of 35 to 70 years with history of type II DM lasting for at least 2 years. The cases having prior history of ischemic heart disease and those with dyslipidemia and end stage liver or renal failure were excluded from this study. Diastolic dysfunction was labeled on echocardiography and where E/A ratio of less than 0.8 was labelled as yes.

### Statistical analysis

The data was entered and analyzed by the help of SPSS-23. Post stratification chi square test was applied taking p value less than 0.05 as significant.

## RESULTS

In this study, there were 100 cases of type II DM. The mean age of the participants was  $54.12 \pm 7.56$  years as in table I. There were total 56 (56%) males and mean duration of DM was  $7.78 \pm 2.23$  years. Diastolic dysfunction was seen in 50 (50%) of the cases. there was no significant difference in terms of gender and different age groups with p values of 0.92 and 0.51 as shown in tables II & III respectively. Diastolic dysfunction was seen significantly high in cases that had Type II DM for

more than 5 years affecting 39 (54.92%) cases as compared to 11 (37.93%) cases with duration less than this with p value of 0.02 as in table IV.

**Table I: Study demographics.**

Demographics	Mean $\pm$ SD	Range
Age (years)	$54.12 \pm 7.56$	35-70
BMI ( $\text{kg}/\text{m}^2$ )	$29.67 \pm 4.19$	26-41
Duration of DM (years)	$7.78 \pm 2.23$	2-22

**Table II: Diastolic dysfunction & Gender**

Gender	Diastolic dysfunction		Total	p value
	Yes	No		
Male	27 (48.21%)	29 (51.79%)	56 (100%)	0.92
Female	23 (52.27%)	21 (47.73%)	44 (100%)	
<b>Total</b>	<b>50 (50%)</b>	<b>50 (50%)</b>	<b>100 (100%)</b>	

**Table III: Diastolic dysfunction & age.**

Age	Diastolic dysfunction		Total	p value
	Yes	No		
35-50	31 (46.26%)	36 (53.74%)	67 (100%)	0.51
>50	18 (54.54%)	15 (45.46%)	33 (100%)	
<b>Total</b>	<b>50 (50%)</b>	<b>50 (50%)</b>	<b>100 (100%)</b>	

**Table IV: Diastolic dysfunction & duration of type II DM.**

Duration of type II DM	Diastolic dysfunction		Total	p value
	Yes	No		
>5 Yrs	39 (54.92%)	32 (45.08%)	71 (100%)	0.02
5 yrs or less	11 (37.93%)	18 (62.07%)	29 (100%)	
<b>Total</b>	<b>50 (50%)</b>	<b>50 (50%)</b>	<b>100 (100%)</b>	

## DISCUSSION

Cardiac dysfunctions are posing a great health care burden and diastolic dysfunctions were highly under rated but now under extensive discussion as these are to impact the heart greatly along with systolic dysfunction. On the other hand DM is also increasing immensely and affecting the heart in various ways.

Out of the 100 cases of type II DM, diastolic dysfunction was observed in 50 (50%) of the cases. The results were close to the data analyzed in the past. In a study done by Sharanavan et al, DD was found in 66 (55%) of cases having type II DM.<sup>[6]</sup> Patil et al, also enforced the results of the previous and the present studies and their prevalence of DD was seen in 54.33% of the cases having DM.<sup>[8]</sup>

Diastolic dysfunction was seen significantly high in cases that had Type II DM for more than 5 years affecting 39 (54.92%) cases as compared to 11 (37.93%) cases with duration less than this with p value of 0.02. The data has also shown a positive correlation in terms of length of the DM and development of the diastolic dysfunction. A case control study was done by Alfried et al, and they compared the cases of DM and non DM and

DD was seen significantly high in cases having DM and furthermore they noted that the cases that had longer the duration of DM and high chances of diastolic dysfunction was noted with  $p < 0.05$ .<sup>[9-10]</sup> In another study Russo, et al, found a positive correlation of diastolic dysfunction and length of DM and there was a liner correlation with  $p < 0.05$ .<sup>[10]</sup> Kumar et al also revealed a significant association of length of DM and development of diastolic dysfunction with  $p = 0.001$ .<sup>[11]</sup>

## CONCLUSION

Diastolic dysfunction is very common and is seen in every other cases of Type II DM and is significantly high in cases with duration of DM for more than 5 years.

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