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Research Article

**STUDY TO KNOW THE ASYMPTOMATIC DIASTOLIC  
DYSFUNCTION FREQUENCY IN PATIENTS HAVING TYPE II  
DIABETES WITH NORMAL SYSTOLIC FUNCTION**<sup>1</sup>Sheikh Moazzam Waheed, <sup>2</sup>Dr Hira Khurram<sup>1</sup>University of Lahore<sup>2</sup>Women Medical Officer Basic Health Unit Ahdhian, Muridke, Sheikhpura**Abstract:**

*The incidence of ischemic heart disease (IHD) in diabetic patients is more as compared to general population. Diabetes is most commonly associated with an increase in cardiovascular complications with IHD and left ventricular dysfunction. Diastolic dysfunction is defined as an early manifestation of this diabetic cardiovascular disease in front of systolic damage.*

***Objective:** The aim of this study was to know the asymptomatic diastolic dysfunction frequency in type II diabetic patients with normal systolic function.*

***Materials and methods:** A definite study was conducted in the Cardiology department of Chaudhry Pervaiz Elahi Institute of Cardiology for a period of six months. We studied 200 patients with long-standing type II diabetes mellitus for four years. Echocardiography was performed to evaluate the diastolic dysfunction of the left ventricle.*

***Results:** In our study, 15.50% (n = 31) were aged between 40-45, 31.5% (n = 63) were between 46-50 and 53% (n = 106) were between 51-55 years. age. The mean age was  $49.84 \pm 4.232$  years, 55% (n = 110) and 45% (n = 90), respectively. Diastolic dysfunction was higher in patients with long-term diabetes mellitus. Type II like (78,40%).*

***Conclusions:** In this study, high diastolic dysfunction was observed in diabetic patients. Echocardiography should be performed for the early diagnosis and treatment institution. This will reduce morbidity and improve the outcome and prevent future heart failure.*

**Keywords:** left ventricular dysfunction, ischemic heart disease, diastolic dysfunction, type II diabetes mellitus.

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**INTRODUCTION:**

Diabetes is emerging as a worldwide epidemic. Untreated is one of life-threatening metabolic disorders that can lead to long-term complications and premature deaths. In developing countries, there is an increase of 170% in the incidence of diabetes and 47% in developed countries. The prevalence of diabetes in Pakistan is 13.14%. Diastolic dysfunction is a common feature of type II diabetes mellitus without symptoms and symptoms of heart disease, and is probably an early feature of diabetic cardiomyopathy. Left ventricular diastolic function is affected before systolic function of asymptomatic type 2 diabetes mellitus. It has been reported that diastolic dysfunction remains an independent predictor of heart failure risk and that each increase in  $E/e'$  is associated with an increase of 15%.

Heart failure is 3% more likely to develop in the future. In symptomatic disease asymptomatic diastolic dysfunction is more common. When present, diastolic dysfunction is indistinguishable from systolic dysfunction. These include: decreased exercise capacity, edema development; Paroxysmal nocturnal dyspnea; and orthopa Due to the greater stiffness in the chamber, exercise does not increase left ventricular diastolic volume (LVEDV), patients with diastolic dysfunction, which prevents the necessary increase in stroke volume. For this reason, intolerance to exercise is usually an early symptom. Diastolic dysfunction can be assessed by the use of Doppler echocardiography. Asymptomatic patients with diabetes and preserved left ventricular ejection (LVEF) may have diastolic dysfunction assessed by echocardiography. Doppler echocardiography is a valuable, simple and noninvasive tool for diagnosing diastolic dysfunction. Before developing cardiac symptoms in diabetics, it should be done routinely to assess cardiac function in every diabetic patient.

Diastolic dysfunction reported in 64% of patients having diabetes mellitus (DM) 7 in the literature. Another study reported a significant association between diabetes mellitus (DM) and diastolic dysfunction (DD). The incidence of asymptomatic diastolic dysfunction reported in DM patients was 54.33%.

**METHODS AND OBJECTIVES:**

Inclusion criteria: Type 2 diabetes mellitus Patients , 40-55 years of age in both cysts, and 3 patients with left ventricular systolic function (LVEF:  $\geq 50\%$ ) on echocardiography. Patients with hypertension (blood pressure  $> 140/90$  mmHg), chronic renal failure (serum creatinine  $> 1.2$ , blood urea  $> 50$  mg / dl), patients with evidence of chronic liver disease, cardiomyopathy, coronary artery (angina, chest pain , except for electrocardiographic changes) and patients with evidence of valve heart disease. Diagnostic criteria: Echocardiography will be marked when any of the following signs are observed:

- 1 Fast diastolic filling rate (E wave) and late filling atrial contraction (wave A) ( $E / A$  ratio)  $< 1$  or  $> 2$ . Stage 2 is distinguished by  $E / e' > 15$  ratio.
- 2 Deceleration time (DT)  $< 150$  or  $> 250$  ms.
- 3 Isovolumic relaxation time (IVRT)  $< 60$  or  $> 100$  ms.
- 4 Ejection fraction  $> 50\%$

**RESULTS:**

A total of 200 cases that met the inclusion / exclusion criteria to determine the frequency of asymptomatic diastolic dysfunction in type II diabetes mellitus normal LV systolic function. 55% (n = 110) male and 45% female (n = 90) of the cases by sex. (N = 31), 40-45 years, 31.50% (n = 63), 46-50 years and 53% (n = 106) according to age distribution of the patients. Between the ages of 51 and 55, the average age was  $49.84 \pm 4.23$ . (Table 1,2)

Table-1: Descriptive Characteristics

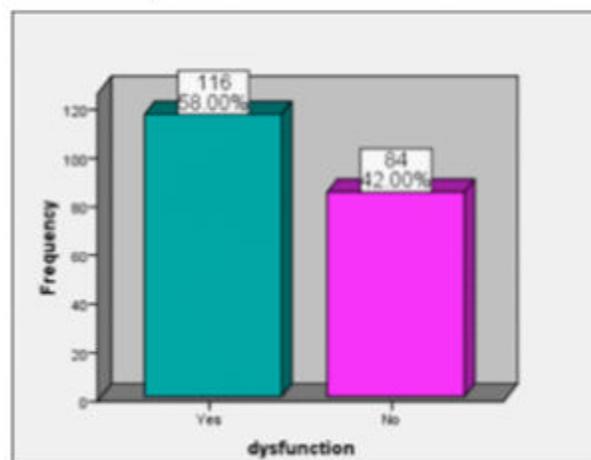
Variable		Frequency (%)
Gender	Male	90(45%)
	Females	110(55%)
Age		49.80±4.23
Duration of diabetes mellitus (years)	4-9 Years	126(63%)
	10-14 Years	74(37%)
BMI	≤ 30	137(68%)
	>30	63(31.5%)
Smoking		84(42%)

Table-2: Patient characteristics with respect to distribution of Diastolic dysfunction

Variables		Diastolic Dysfunction		P-value
		YES 116(58.0%)	NO 84(42.0%)	
Gender	Male	64(58.2%)	46 (41.8%)	0.920
	Female	52(57.8%)	38(42.2%)	
Age	40-45	14(45.2%)	17(54.8%)	0.394
	46-50	33(52.4%)	30(47.6%)	0.297
	51-55	69(65.1%)	37(34.9%)	0.041
Duration of diabetes	4-9 Years	58(46%)	68(54%)	0.001
	10-14 Years	58(78.4%)	16(21.6%)	
BMI	≤30	73(62.9%)	64(76.2%)	0.066
	>30	43(37.1%)	20(23.8%)	
Smoker		63(75.0%)	21(25.0%)	0.001

According to the duration of diabetes mellitus distribution, 63% (n = 126) patients had diabetes mellitus between 4 and 9 years and 37% (n = 74) (Table 1) The frequency of diastolic dysfunction was 58% (n = 116) while 42% (n = 84) did not show diastolic dysfunction. (Fig. 1).

Figure-1: Graphical distribution according to diastolic dysfunction.



In the classification of diastolic dysfunction by sex, 64 were male, 52 female, and p value was 0.92. (Table 2) were in the layer for 116 cases of diastolic dysfunction, 14 between 40-45 years, 33 between 46-50 years, and 69 between 51-55 years. (Table 2) Diabetes mellitus in 116 of diastolic dysfunction, diabetes mellitus in 4-9 years in 58 and duration of diabetes mellitus in 58 was 10-14 years, p value was 0.001. . (Table 2)

### DISCUSSION:

Cardiovascular disease (CVD) now accounts for almost half of noncommunicable diseases (NCD). NCDs continue to be the leading cause of death as a global burden of infectious diseases and CVD remains the cause of death, with 17.3 million deaths per year and 2030.8 worldwide expected to rise to more than 23.6 million deaths Diastolic heart failure (DHF), symptoms of patients and heart failure (HF) is a clinical syndrome with normal or normal left ventricular ejection fraction (LV), LV volume. (HF-PEF) and diastolic heart failure (DHF) This study

was conducted to investigate the relationship between type II diabetes mellitus (HF) and diastolic dysfunction we plan to see the prevalence of asymptomatic diastolic dysfunction with ventricular systolic function in patients with mellitus Second, it may be helpful to find high-risk patients requiring early intervention and more aggressive treatment, morbidity and mortality. Diastolic dysfunction is the most prominent feature of diabetic cardiomyopathy. The Framingham study firmly established the epidemiological link between diabetes and heart failure<sup>10</sup>. Our Findings Patil *et al*. Diastolic

dysfunction was 54.33% and the prevalence of diastolic dysfunction was higher in patients with longer diabetes mellitus. Another study by Poirier P et al. In this study, diastolic dysfunction was found in 60% of diabetic patients. Patil MB et al. higher diastolic dysfunction in patients with diabetes mellitus (64%) 7 Indirectly, these showed different results due to the small sample size. Asymptomatic diastolic dysfunction is more common in symptomatic diastolic heart failure. Our results showed that the tendency to diastolic dysfunction was 51 to 55 years (65.1%) in the age groups. The prevalence and severity of diastolic dysfunction increases with age, and the development or worsening of diastolic dysfunction is associated with increased HF11 risk. Unfortunately, limited work has been done in Pakistan. Our study is one of these types in Pakistan to assess the frequency of asymptomatic diastolic dysfunction in type II diabetic patients. In our study, the prevalence of asymptomatic diastolic dysfunction was higher in type II diabetes mellitus. More studies should be done to investigate the relationship between asymptomatic diastolic dysfunction and type II diabetes mellitus, which may help improve the management of patients with diastolic dysfunction in the future.

### CONCLUSION:

The overall diastolic dysfunction prevalence is high in patients having Type II diabetes mellitus. Asymptomatic diastolic dysfunction is more common in patients with long duration of diabetes mellitus. Early diagnosis and treatment of diastolic dysfunction should be applied to reduce morbidity and improve the outcome of diastolic heart failure.

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