

ORIGINAL RESEARCH

Echocardiographic tissue doppler imaging in diastolic dysfunction

Dr. Lovekesh

Associate Professor, Department of Radio Diagnosis, Gouri Devi Institute of Medical Sciences & Hospital, Durgapur, West Bengal, India

Corresponding author

Dr. Lovekesh

Associate Professor, Department of Radio Diagnosis, Gouri Devi Institute of Medical Sciences & Hospital, Durgapur, West Bengal, India

Received: 11 August, 2022

Accepted: 15 September, 2022

ABSTRACT:

Background: Diastolic dysfunction is one of the most widely documented cardiovascular issue. The present study was conducted to evaluate echocardiography in left ventricular diastolic dysfunction among diabetics.

Materials & Methods: 70 patients with diastolic dysfunction of both genders were selected. Echocardiography was performed with convex transducer. Grading of left ventricular systolic and left ventricular diastolic dysfunction was done. Blood investigation such as fasting and random blood sugar and glycated hemoglobin level was estimated to detect underlying diabetes. **Results:** Out of 70 patients, males were 40 and females were 35. Left ventricular systolic dysfunction (LVSD) was seen in 35 subjects, in which 11 were non-diabetic and 24 were diabetics. Grading found to be 0 seen in 0 and 4, 1 seen in 2 and 6, 2 seen in 4 and 8, 3 in 5 and 6 subjects with non-diabetes and diabetes respectively. Left ventricular diastolic dysfunction (LVDD) was found in 35 subjects. In LVDD, 19 were diabetics and 16 were non-diabetic. In LVDD, 19 were diabetics and 16 were non-diabetics. Grading in LVDD found to be 0 seen in 2 in non-diabetics, 1 seen in 6 and 6, 2 seen in 5 and 9, 3 in 3 and 4 subjects with non-diabetes and diabetes respectively. The difference was significant ($P < 0.05$). **Conclusion:** Authors found that diastolic dysfunction can be assessed with echocardiography. Diabetes mellitus had independent positive impact on left ventricular diastolic dysfunction.

Key words: Diabetes mellitus, Echocardiography, LVDD

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INTRODUCTION

Diastolic dysfunction is one of the most widely documented cardiovascular issue which prompts clinical crisis, the mass of left ventricle is thickened with insufficient filling of ventricles raising the weight inclination of blood in the aspiratory vessels which brings about the transudate liquid spillage into the lung alveoli causing pneumonic oedema which lessens the degree of oxygen in blood creating brevity of breath and even passing if not identified and treated promptly.¹ Diastole is the period during which the myocardium does not have its capacity to deliver power and continues to an unstressed measurement and quality bringing about deficiency of these courses causing diastolic dysfunction and the progressions in diastolic capacity can be available without cardiovascular breakdown with or without systolic function.²

Left ventricular wall thickness and mass at transthoracic echocardiography are often increased in master athletes, a growing population of trained subjects observed in sports medicine.³ These modifications induced by intense physical training

(athlete's heart) result from cardiac remodelling which is characterized by normal left ventricular performance and normal or increased capillary density with little or no fibrosis. Increase in left ventricular mass may also be the consequence of a constant pressure overload, typical of the hypertensive state that is often present in this middle-aged population.⁴ Aging, corpulence, diabetes mellitus, cardiovascular ischemia, hypertension, aortic stenosis, myocardial illnesses, endomyocardial clutters, pericardial emission and constrictive pericarditis are different normal reasons for left ventricular diastolic dysfunction.⁵ The present study was conducted to evaluate echocardiography in left ventricular diastolic dysfunction among diabetics.

MATERIALS & METHODS

The present study consisted of 70 patients with diastolic dysfunction of both genders. All were informed regarding the study and their written consent was obtained.

Data such as name, age, gender etc. was recorded. Echocardiography was performed with

convextransducer. Grading of left ventricular systolic and left ventricular diastolic dysfunction was done. Blood investigation such as fasting and random blood sugar and glycated hemoglobin level was estimated to

detect underlying diabetes. Results of the study was subjected to statistical analysis. P value less than 0.05 was considered significant.

RESULTS

Table I: Distribution of patients

Total- 70		
Gender	Males	Females
Number	40	30

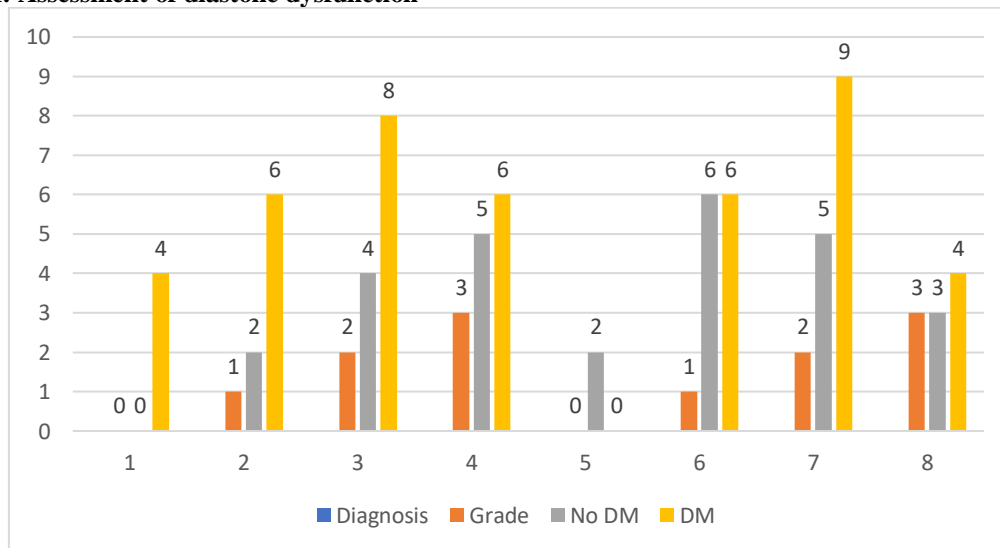
Table I shows that out of 70 patients, males were 40 and females were 35.

Table II: Assessment of diastolic dysfunction

Diagnosis	Grade	No DM	DM	P value
LVSD	0	0	4	0.04
	1	2	6	
	2	4	8	
	3	5	6	
LVDD	0	2	0	0.05
	1	6	6	
	2	5	9	
	3	3	4	

Table II, graph I shows that left ventricular systolic dysfunction (LVSD) was seen in 35 subjects, in which 11 were non- diabetic and 24 were diabetics. Grading found to be 0 seen in 0 and 4, 1 seen in 2 and 6, 2 seen in 4 and 8, 3 in 5 and 6 subjects with non- diabetes and diabetes respectively. Left ventricular diastolic dysfunction (LVDD) was found in 35 subjects. In LVDD, 19 were diabetics and 16 were non- diabetic. In LVDD, 19 were diabetics and 16 were non- diabetics. Grading in LVDD found to be 0 seen in 2 in non- diabetics, 1 seen in 6 and 6, 2 seen in 5 and 9, 3 in 3 and 4 subjects with non- diabetes and diabetes respectively. The difference was significant (P< 0.05).

Graph I: Assessment of diastolic dysfunction



DISCUSSION

Heart failure is a complex clinical syndrome arising from any structural or functional cardiac condition that impairs left ventricular (LV) filling or ejection.⁶ The principal symptoms of heart failure are dyspnea, fatigue and fluid retention, which may lead to pulmonary congestion and peripheral edema.⁷ In the United States, approximately 5 million patients have heart failure, and over 550,000 individuals are newly diagnosed with heart failure each year. The estimated

total direct and indirect cost of heart failure in the United States is close to 30 billion dollars per year.⁸The present study was conducted to evaluate echocardiography in left ventricular diastolic dysfunction among diabetics.

We found that out of 70 patients, males were 40 and females were 35. The Strong Heart Study indicated that the mix of hypertension and diabetes was related with more noteworthy weakness of diastolic

unwinding subsequent to changing for covariates, for example, age and LVM.⁹

We found that left ventricular systolic dysfunction (LVSD) was seen in 35 subjects, in which 11 were non-diabetic and 24 were diabetics. Grading found to be 0 seen in 0 and 4, 1 seen in 2 and 6, 2 seen in 4 and 8, 3 in 5 and 6 subjects with non-diabetes and diabetes respectively. Left ventricular diastolic dysfunction (LVDD) was found in 35 subjects. In LVDD, 19 were diabetics and 16 were non-diabetic. In LVDD, 19 were diabetics and 16 were non-diabetics. Grading in LVDD found to be 0 seen in 2 in non-diabetics, 1 seen in 6 and 6, 2 seen in 5 and 9, 3 in 3 and 4 subjects with non-diabetes and diabetes respectively. Galanti G et al¹⁰ evaluated the role of pulsed wave tissue doppler imaging in differentiating pathological from physiological LVH in 80 master athletes, a group of 80 sedentary subjects with essential hypertension and an apparent normal diastolic function at standard PW Doppler analysis. The two groups were comparable for increased left ventricular wall thickness and mass index (134.4 ± 19.7 vs 134.5 ± 22.1 gr/m²; $p > .05$). Diastolic function indexes using the PW technique were in the normal range for both. Pulsed Wave TDI study of diastolic function immediately distinguished the two groups. While in master athletes the diastolic TDI-derived parameters remained within normal range ($E' 9.4 \pm 3.1$ cm/sec; $E/E' 7.8 \pm 2.1$), in the hypertensive group these parameters were found to be constantly altered, with mean values and variation ranges always outside normal validated limits ($E' 7.2 \pm 2.4$ cm/sec; $E/E' 10.6 \pm 3.2$), and with E' and E/E' statistically different in the two groups. Results showed that the TDI technique can be an easy and validated method to assess diastolic function in differentiating normal from pseudonormal diastolic patterns and it can distinguish physiological from pathological LVH.

Nishimura et al¹¹ in their study a total 149 patients were taken a crack at the investigation, in which out of 149 patients 53(35.6%) were female and 96(64.5%) were male. 37 patients were analyzed ordinary, 86 were analyzed as grade 1, 22 patients were analyzed as grade 2, and 4 were analyzed as grade 3. Out 149 patients 141 were hypertensive. 86 were finding LVDD, 26 patients were determination LVSD and 37 were conclusion ordinary. 82 patients were not diabetic and 67 were diabetic. The mean of the age of the patients was 54 years and Std. deviation was 10.64%. Left ventricular diastolic dysfunction is a hazard factor for the improvement of congestive cardiovascular breakdown.¹² The higher predominance of diastolic dysfunction and cardiovascular breakdown with saved discharge part (HFpEF) in type-2 diabetes patients appears to show the effect of diabetes in the improvement of these conditions and is related with changes in heart digestion, structure, work and the instruments adding to myocardial dysfunction in diabetes incorporate hyperglycemia,

lipotoxicity, insulin obstruction and weight is a high hazard marker, an increment in weight, moreover associate with diabetes, hypertension, hyperlipidemia and impacts heart capacity and structure with developing age.¹³

CONCLUSION

Authors found that diastolic dysfunction can be assessed with echocardiography. Diabetes mellitus had independent positive impact on left ventricular diastolic dysfunction.

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