

ORIGINAL RESEARCH

## Prevalence of left ventricular hypertrophy in type 2 diabetics: A hospital-based study

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**Introduction:** In the general population, left ventricular hypertrophy affects 15–20% of adults. Patients with cardiovascular disease frequently have LVH. Compared to the general population, patients with DM have an increased rate of LVH. Many studies indicate a connection between diabetes mellitus and left ventricular dysfunction.

**Aim:** The aim was to study the prevalence of LVH among DM patients in a hospital-based setting in south India.

**Methods:** In a hospital-based population in south India, we looked at the relationship between diabetes mellitus and left ventricular failure. The study comprised 133 diabetic patients from our institution who met the inclusion requirements. ECG and ECHO were used to assess the subjects for the presence of LVH. Diabetes patients had a 25.6% prevalence of left ventricular hypertrophy. We found significant differences in the older age, hypertension, duration, duration of type 2 diabetes mellitus, mean fasting blood sugar (FBS), and HbA1c ( $P = 0.0020$ ) when we compared both groups of participants with DM. However, neither the gender nor the body mass index (BMI) showed any significant results ( $P = 0.3112$ ).

**Conclusion:** LVH is more common in diabetics than in non-diabetics by a large margin. In diabetic patients with systemic hypertension, older age groups, those who have had diabetes and hypertension for a longer period of time, as well as those with higher FBS and HbA1c values, LVH prevalence rises even more.

**Keywords:** diabetes mellitus, left ventricular hypertrophy

### Introduction

Diabetes mellitus is a disorder brought on by a lack of insulin secretion, insulin action, or both (1). There are two types of diabetes mellitus. A complicated group of illnesses known as type 2 diabetes mellitus (T2DM) is characterized by varying degrees of resistance to insulin action, insufficient production, and excessive or incorrect glucagon secretion. Complete or nearly total insulin insufficiency is the root cause of type 1 diabetes mellitus. Diabetes's effect continues to grow significantly on a global scale (2). Hyperglycemia, which can manifest itself in a variety of ways, causes metabolic dysfunctions involving proteins, lipids, and carbs. The majority of microvascular and macrovascular

diabetic complications, which are commonly brought on by chronic hyperglycemia, are the cause of diabetes-related morbidity and mortality (3). Organ system vasculature structural and functional disorders lead to microvascular and macrovascular issues. These conditions have an effect on the body's organs, particularly the eyes, kidneys, heart, and nerves, which can lead to organ damage, dysfunction, and eventually organ failure (4).

The cardiac complication most commonly seen in a person with diabetes is thickening of the arteries of the heart, also known as atherosclerosis, which is a piling-up of cholesterol in the vessels that supply the heart with oxygen and nutrition.

Heart failure (HF) is a common adverse effect of diabetes, with prevalence rates as much as 22% and increasing

occurrences. Diabetes patients can develop HF even without any other comorbidity. It may also be the initial indication of cardiovascular disease. The prevalence of diabetes has increased by 30% globally over the preceding ten years, and the burden of HF on the healthcare system has also increased (and is predicted to continue to rise).

Diabetes-related cardiomyopathy is known to be influenced by a number of factors. Heart failure is more common after myocardial infarction in people. Deterioration of the left ventricular systolic and diastolic functions results in heart failure.

It is not proven that is linked to an increase in left ventricular mass. Patients with T2DM frequently have left ventricular hypertrophy (LVH), which is an indicator of poor cardiovascular outcomes including heart failure. The hyperglycemia-related cellular changes do not entirely account for the LVH. In these at-risk patients, the identification of asymptomatic LVH is important.

## Materials and methods

For the study, 133 participants from Sri Gokulam Medical College were chosen. The research was cross-sectional in nature. Patients who had previously experienced a cardiac event or a stroke were excluded. The study did not include known LVH cases.

Blood pressure (BP) was measured. T2DM was determined by the patient's self-report of such a history. Every person who had undergone angioplasty or bypass surgery or experienced a myocardial infarction was deemed to have coronary artery disease.

An ordinary 12-lead supine resting ECG was employed in this experiment to identify LVH. The foundation for LVH diagnostic standards is laid by QRS height. A 2D ECHO was performed after an ECG to confirm the diagnosis of LVH.

Information regarding the duration of diabetes and hypertension, fasting blood sugar (FBS) and HbA1c values, use of antihypertensive medications, blood sugar, and ECGs was collected from patients.

## Results

A total of 133 patients were recruited, of them 45.9 were men and 54.1 were women. The means for age (years), BMI,

**TABLE 1** | Comparison between various characteristics of patients with and without LVH.

Characteristics	LVH(26.3%)	No LVH(73.7%)
Age	56.3 ± 6	54 ± 6
FBS	222	185
HbA1c	8.5	7.6
Duration of diabetes	21 years	17 years
Duration of hypertension	19 years	14 years

duration of HTN (years), duration of type 2 diabetes (years), and FBS were 55 years, 145 mm Hg, 85 mm Hg, 28.3, 15 years, and 17 years, respectively. The various patient characteristics are mentioned in [Table 1](#).

## Discussion

In their study titled "Left Ventricular Mass in Diabetes Hypertension," Grossman et al. (1) hypothesize that, regardless of arterial blood pressure, DM increases LVH. In our investigation, the prevalence of LVH was 26.3% in the studied population. Patients with LVH had a higher prevalence of LVH.

## Conclusion

The prevalence of ECG- and ECHO-confirmed LVH in diabetics was 26.3% in our study. The percentage of patients with hypertension was more in the LVH subgroup compared to the non-LVH subgroup.

## References

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