

# A cross sectional study of asymptomatic cardiac findings in non insulin dependent diabetes mellitus

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## Abstract:

**Introduction:** Diabetes mellitus, is an ever progressive, disease . It is also considered as coronary artery disease equivalent. People with type 2 diabetes mellitus (T2DM) have a higher cardiovascular morbidity and mortality, and are disproportionately affected by CVD compared with non-diabetic subjects<sup>1,8</sup>. Diabetic vascular disease is responsible for two to four-fold rise in the occurrence of coronary artery disease (CAD) and stroke, and two-eight-fold improve in the risk of heart failure<sup>2</sup>. It affects roughly one-third of all acute myocardial infarction patients. According to the global burden of disease assessment, India is expected to have significant increase in diabetes prevalence and subsequently coronary artery disease.

**Materials and Methods:** This cross-sectional study was done at Venkateshwara institute of medical sciences, Gajraula among 50 patients who attended the institute (both in and out patient between January 2022 and august 2022. Initial step consisted of consent for study followed by medical history, physical and systemic examinations. After the preliminaries, routine and detailed investigations were done. All those who were asymptomatic with regard to cardiac symptoms such as dyspnea, chest pain etc and were having non-insulin dependent diabetes mellitus for one year or more duration were included. Investigations done included CBC, Renal function test, lipid profile, fasting and post prandial blood sugar, fundus examination to assess end organ damage, ECG, echocardiography and treadmill stress test or dobutamine stress test.

**Results:** This study included 50 NIDDM patients. There was a little difference among males (n=28) and females (n=22) in the study which correlates with other studies that there is no sex difference in the incidence of Diabetes. With regard to age group 30 patients (60%) belong to 5th decade. 40 % patients In this study (20 out of 50) had diabetes less than 5 years, 20 patients (40 %) had diabetes of 5-10-year duration and 10 patients (20%) had diabetes more than 10 years. 14 (28%) patients showed silent myocardial ischemia on TMT or Stress echo. 2 patients (4%) developed minor angina on stress test but were able to complete the test. 3 (6% ) patient showed baseline regional wall motion abnormality with/or LV systolic dysfunction.

**Conclusion:** There was only minor difference in gender distribution in favor of males . As per age distribution the majority of the patients were in 5<sup>th</sup> decade. Our study showed lipid abnormalities included Hypertriglyceridemia as most prevalent 25 (50%), however LDL level was more than 130mg/dl in 20 (40%) of patients as well. With stress tests , 28% (14 out of 50) of patients had asymptomatic inducible ischemia and 2 patients (4%) developed minor angina on stress test but were able to complete the test. 3 (6% ) patient showed baseline regional wall motion abnormality with/or LV systolic dysfunction.

**Key Words:** asymptomatic inducible ischemia, NIDDM, ECG, dyslipidemia, serum triglycerides.

## INTRODUCTION

Diabetes mellitus, is an ever progressive, disease . It is also considered as coronary artery disease equivalent. People with type 2 diabetes mellitus (T2DM) have a higher cardiovascular morbidity and mortality, and are disproportionately affected by cardiovascular disease compared with non-diabetic subjects<sup>1</sup>. Diabetic vascular disease is responsible for two to four-fold rise in the occurrence of coronary artery disease (CAD) and stroke, and two-eight-fold improve in the risk of heart failure<sup>2</sup>. It affects roughly one-third of all acute myocardial infarction patients. According to the global burden of disease assessment, India is expected to have significant increase in diabetes prevalence and subsequently coronary artery disease.<sup>3</sup> Because the diabetes is essentially a disease significantly affecting both cardiac and vascular components, MI, heart failure, and end organ damage is a pathologic sequel.<sup>1</sup>

early identification and better control of diabetes mellitus is essential for prevention of development of cardiovascular complications and end organ damage , cardiovascular disease, hear failure, diastolic dysfunction of left ventricle , Diabetic retinopathy, peripheral arterial disease, cerebrovascular disease are due to vascular and microvascular involvement due to diabetes.<sup>4</sup>

this study was intended to study asymptomatic diabetic patients , with regard to identify silent involvement of cardiovascular system, in patients with non insulin dependent diabetic patients utilizing routine tests, and specific tests including a Resting ECG, Stress tests| ( TMT/Stress echo/dobutamine stress echo) and a Echocardiogram.

## MATERIALS AND METHODS

**Study design:** A cross-sectional study.

**Study location:** VIMS, Gajraula.

**Study Duration:** January to August 2022.

**Sample Size:** 50 patients.

This cross-sectional study was done at Venkateshwara institute of medical sciences, Gajraula among 50 patients who attended the institute (both in and out patient between January 2022 and august 2022. Initial step consisted of consent for study followed by medical history, physical and systemic examinations. After the preliminaries, routine and detailed investigations were done. All those who were asymptomatic with regard to cardiac symptoms such as dyspnea, chest pain ,palpitation, syncope and were having non-insulin dependent diabetes mellitus for one year or more duration were included. Investigations done included CBC, Renal function test, lipid profile, fasting and post prandial blood sugar, HbA1c, fundus examination to assess end organ damage, ECG, echocardiography and treadmill stress test or dobutamine stress test.

### Inclusion Criteria

1. Non-Insulin dependent Diabetes Mellitus (atleast 1 year duration since diagnosis)
2. Asymptomatic with regard to cardiovascular symptoms
3. Age 25-75 years.

### Exclusion Criteria

1. Symptomatic with regard to cardiovascular symptoms (classical angina, dyspnea, significant palpitation, syncope, presyncope)

2. Prior or recent history of chest pain, myocardial infarction, Heart failure, Arrhythmias, Cerebrovascular disease, PTCA or CABG.
3. History of hospitalization in past for uncontrolled diabetes (needing Insulin)
4. History of accelerated hypertension.
5. History of any cardiomyopathy
6. Previously identified severe valvular disease (stenotic or regurgitant)
7. Patients with >1 mm ST segment depression or pathological Q-waves on resting ECG.

## RESULTS

This study included 50 NIDDM patients. With regard to age group 30 patients(60%) belong to 5th decade. 40 % patients In this study (20 out of 50) had diabetes less than 5 years, 20 patients (40 %) had diabetes of 5-10-year duration and 10 patients (20%) had diabetes more than 10 years. There was a little difference among males (n=28) and females (n=22) in the study which correlates with other studies that there is no significant sex difference in the prevalence of Diabetes. However slight difference in male to female ratio may be due to less awareness among females due to social reasons. 14 (28%) patients showed silent myocardial ischemia on TMT or Stress echo. 2 patients (4%) developed minor angina on stress test but were able to complete the test. 3 (6% ) patient showed baseline regional wall motion abnormality with/or LV systolic dysfunction.

S.No	Duration in years	Number of patients	Percentage
1	<5 years	20	40%
2	5-10 years	20	40%
3	>10 years	10	20%

**Table 1:Distribution of Age Group in the Present Study**

S.No	SEX	Number of patients	Percentage
1	Male	28	56%
2	Female	22	44%
3	Total	50	100

**Table 2: sex distribution**

S.No	Duration in years	Number of patients	Percentage
1	<5 years	20	40%
2	5-10 years	20	40%
3	>10 years	10	20%

**Table 3: Age Distribution of Study Group in the Present Study**

S.No	HbA1c	Number of patients	Percentage
1	<6.5	7	14%
2	6.5-7	14	28%
3	7-8	10	20%
4	>8	19	38%
6	Total	50	100%

Table 4: Relative HbA1c levels in Study

S.No	Stress test / Stress echocardiography	Number of patients	Percentage
1	Asymptomatic positive	14	28%
2	Symptomatic positive	2	4%
3	negative	31	62%
4	Baseline RWMA/ LV systolic dysfunction	3	6%

TABLE 5: RESULT OF CARDIAC EVALUATION

## DISCUSSION

14 (28%) patients showed silent myocardial ischemia on TMT or Stress echo. 2 patients (4%) developed minor angina on stress test but were able to complete the test. 3 (6%) patient showed baseline regional wall motion abnormality with/or LV systolic dysfunction. This study reports slightly more incidence of involvement of cardiovascular system in asymptomatic NIDDM patients compared to few previous studies. The study done by Pasupathy S. et al showed inducible ischemia in 17% of cases (11 out of 63 cases) by TMT.<sup>5</sup> Of those having HbA1c levels higher than 8 (19 patients), 3 (6%) had baseline RWMA on echocardiography or lv systolic dysfunction, and this group also comprised of 8 out of 16 stress test positive patients, supporting theory of poor diabetic control leading to worse cardiovascular outcomes. Similarly none of the 7 patients who had good diabetic control (HA1c <6.5) had any positive stress test, or baseline echocardiographic changes. In another study conducted by Madhur et al, prevalence of asymptomatic CAD in diabetic patients was 26.66%. Asymptomatic CAD was significantly associated with the duration of diabetes, glycemic control and deranged lipid profile.<sup>6</sup> Dyslipidemia alone can be detrimental as it can in isolation be responsible for coronary artery disease, and significantly more so with CAD equivalent such as diabetes mellitus. Our study showed lipid abnormalities included Hypertriglyceridemia as most prevalent 25 (50%), however LDL level was more than 130mg/dl in 20 (40%) of patients as well which is similar to other studies in past.<sup>7,8</sup> What this shows is that a good diabetes control may very well be the best thing that can be done to prevent cardiovascular complications.

## CONCLUSION

This study included 50 NIDDM patients. Most of the patients belonged to 5th decade. Most of the diabetics were less than 10 years in duration. There was a little difference among males and females in the study which correlates with other studies that there is no significant sex difference in the prevalence of Diabetes. However slight difference in male to female ratio may be due to less awareness among females due to social reasons. One third patients showed silent myocardial ischemia or symptoms or baseline echocardiography findings on TMT or Stress echo

suggesting significant involvement of cardiovascular system in diabetes, more in less diabetic control group. This study emphasize role of good diabetes control.

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