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Prevalence of Newly Diagnosed Diabetes Mellitus Type 2 (T2DM) Among Rural Population: A Hospital Based Study

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ABSTRACT

Introduction: Diabetes Mellitus is a common metabolic syndrome in India, with a history dating back to 1500 BC. It affects carbohydrate, protein, and fat metabolism, affecting insulin production or its respond against glucose. The International Diabetes Federation reports an 8.8% prevalence, with 463 million cases. Glycated Haemoglobin (HbA1c) and Fasting Blood Sugar (FBS) levels are used to detect diabetes.
Aims & Objectives: The study aimed to estimate the prevalence of Newly Diagnosed Diabetes Mellitus type 2 in rural populations by assessing Glycated Hemoglobin (HbA1c) and Fasting Blood Sugar (FBS) levels.
Materials & Methods: A study was conducted on 200 individuals aged 35-60 years, excluding those with pancreatic cancer, surgical removal of pancreas, pregnant women, and those under 30 years old. Blood samples were collected from the Department of Medicine and tests were performed in the Department of Biochemistry at Index Medical College, Indore. Methods used included Trinder's (1969) method and Nathan D M et al. (2008) method.
Results: Out of 200 individuals diagnosed with type 2 diabetes, 117 are male and 83 are female, with a higher prevalence of male patients. The prevalence is highest between ages 36-40, with the minimum number of patients being between 56-60. The HbA1c value for newly diagnosed type 2 diabetes is 6.86±0.21%, while the control group's HbA1c is 5.215±0.33%. The mean fasting blood sugar (FBS) values for newly diagnosed T2DM and control groups are 130.36±2.69 mg/dl and 102.45±9.39 mg/dl, respectively.
Discussion: The study found a higher prevalence of Newly Diagnosed Diabetes Mellitus type 2 in male patients (58.5%) than female patients (41.5%). The highest prevalence was found in the young age group (36-40 years old) and the lowest in the older age group (46-50 years old). The mean glycated hemoglobin and fasting blood sugar levels of newly diagnosed diabetes mellitus type 2 patients and the control group were 6.68±0.21% and 5.215±0.33 mg/dl, respectively.
Conclusion & Summary: A study at Index Medical College in Indore found that 58.5% of newly diagnosed Type 2 Diabetes Mellitus patients were male, with the highest prevalence in the 36–40-year age group. The mean HbA1c level and fasting blood sugar levels were significantly higher in diabetic patients, indicating impaired glucose regulation. This suggests increased vulnerability in midlife due to lifestyle and genetic factors.

Keywords: Diabetes Mellitus type 2, Fasting Blood Sugar, Glycated Haemoglobin, Male, Female

INTRODUCTION

Diabetes Mellitus is one of the common metabolic syndromes in both rural and urban part of India. India is capital of Diabetes Mellitus. History of Diabetes Mellitus was found in Egyptian manuscripts which was backed to 1500 BC.[(1)] Diabetes Mellitus is the disorder of carbohydrate, protein and fat metabolism in which the either the production of insulin or respond of insulin against glucose are affected or both.[(2)] The prevalence of Diabetes Mellitus type 2 was 8.8% by International Diabetes Federation and current scenario shows 463 million.[(3)] Glycated Haemoglobin (HbA1c) is the parameter for the detection of Diabetes Mellitus with normal level below 5.6% and between 5.7 to 6.4% is Pre-Diabetic and above 6.5% is Diabetic. Also, the Fasting Blood Sugar (FBS) with ≥126 mg/dl comes under Diabetic. [(4)]In this present study the prevalence of Newly Diagnosed Diabetes Mellitus type 2 (T2DM) has to be estimated with the help of parameters such as Glycated Haemoglobin (HbA1c) and Fasting Blood Sugar (FBS) level.

Aims & Objectives:

Aim: To estimate the prevalence of Newly Diagnosed Diabetes Mellitus type 2 among Rural population.

Objectives:

- To estimate the Glycated Hemoglobin (HbA1c) level.
- To estimate the Fasting Blood Sugar (FBS) level.
- To correlate the HbA1c and FBS level with Newly Diagnosed Diabetes Mellitus type 2.

MATERIALS & METHODS

A total of 200 individuals of both the gender with aged group between 35 to 60 years was selected. Patients with Pancreatic cancer, Surgical Removal of Pancreas, Pregnant women, Patients with aged grouped below 30 years were excluded. Also, individuals who were not willing to participate for the study were excluded. Blood samples were collected from the Department of Medicine and tests were performed in Department of Biochemistry, Index Medical College, Hospital and Research Centre, Indore.

METHODS

S. No.	Parameter	Method
1.	Fasting Blood Sugar	Trinder's (1969) Method [(5)]
2.	HbA1c	Nathan D M et al. (2008) method [(6)]

OBSERVATIONS & RESULTS

Table 1: Prevalence of Newly Diagnosed Diabetes Mellitus type 2

Gender	Number of Patients	Percentage
Male	117	58.5
Female	83	41.5
Total	200	100

In table 1, out of 200 individuals with newly diagnosed diabetes mellitus type 2, 117 are male and 83 are female, according to data on the prevalence of the condition. Therefore, the percentages for male and female patients are 58.5% and 41.5%, respectively. As a result, we discovered that male patients had a higher prevalence than female patients.

Table 2: Prevalence of Newly Diagnosed T2DM among Different Aged Group

Aged Group (in Years)	Number of Patients	Percentage
36-40	60	30
41-45	30	15
46-50	37	18.5
51-55	59	29.5
56-60	14	7
Total	200	100

In table 2,the prevalence by age group was shown and we found that there are 60 patients (between the ages of 36 and 40), 30 patients (between the ages of 41 and 45), 37 patients (between the ages of 46 and 50), 59 patients (between the ages of 51 and 55), and 7 patients (between the ages of 56 and 60) who have recently been diagnosed with diabetes mellitus type 2. Prevalence rates are 30% for patients aged 36–40, 15% for those aged 41–45, 18.5% for those aged 46–50, 29.5% for those aged 51–55, and 7% for those aged 56–60. Therefore, the prevalence is highest between the ages of 36 and 40, 51 and 55, 46 and 50, 41 and 45, and the minimum number of patients is between the ages of 56 and 60.

Table 3: Mean ± SD of HbA1c and FBS in Newly Diagnosed Diabetes Mellitus type and Control Group

	Patient Group	Control Group
HbA1c (%)	6.86±0.21	5.215±0.33
FBS (mg/dl)	130.36±2.69	102.45±9.39

In table 3, the HbA1c value for patients with newly diagnosed type 2 diabetes is 6.86±0.21%, as indicated by the Mean ± SD. The HbA1c mean ± SD for the control group is 5.215±0.33%. Therefore, the value of glycated haemoglobin rises in cases of newly diagnosed type 2 diabetes. Additionally, the newly diagnosed T2DM and control groups' mean ± SD fasting blood sugar (FBS) values are 130.36±2.69 mg/dl and 102.45±9.39 mg/dl, respectively.

DISCUSSION

The study revealed a higher prevalence of Newly Diagnosed Diabetes Mellitus type 2 in male patients (58.5%) than female patients (41.5%). Our study resembles with Mohan R et al. (2020) [7], Partha Pratim Dey (2025) [8] and Bogdan Stancu et al. (2022) [9]. Also, the prevalence of Newly Diagnosed Diabetes Mellitus type 2 patients is highest in the young age group (36-40 years old), followed by those aged 51-55 years old. The lowest number of cases is found in the older age group (46-50 years old), with a percentage of 30% (36-40 years old), 29.5% (51-55 years old), 18.5% (46-50 years old), 15% (41-45 years old), and 7% (56-60 years old).Our present study resemble with the study conducted by Ganesh S. Anusuya et al.(2018)[10] and doesn't resemble with Ankit Grover et al. (2019)[11], Varaprasad Kalapureddy et al. (2024)[12]. The mean glycated hemoglobin (HbA1c) and fasting blood sugar (FBS) of newly diagnosed diabetes mellitus type 2 patients and the control group are 6.68±0.21% and 5.215±0.33 mg/dl, respectively. These results differ from previous studies, which found FBS and HbA1c levels to be 312mg/dl and 14.9%, respectively. Other studies, such as those by Jagnnath Dixit et al. (2022) [13], Gulam Saidunnisa Begaum et al. (2018) [14], Dr. Bhaskar Bala Sundaram and Dr. Ravi Kumer V.N. (2023) [15], and Faith R.Jersuha and Vandana Raghunath (2023) [16] also found similar results.

CONCLUSION & SUMMARY

A hospital-based study was conducted at Index Medical College, Hospital & Research Centre, Indore involving 200 newly diagnosed Type 2 Diabetes Mellitus patients and 200 healthy controls. The study found that 58.5% of the patients were male and 41.5% were female, with the highest prevalence observed in the 36-40 years age group (30%). The study also revealed that the

mean HbA1c level and fasting blood sugar (FBS) levels were significantly higher in diabetic patients, indicating impaired glucose regulation.

- A total of 200 newly diagnosed Type 2 Diabetes Mellitus (T2DM) patients were compared with 200 healthy controls.
- Gender Distribution: 58.5% were males (117) and 41.5% were females (83), indicating higher prevalence in males.
- Age Distribution: Most common in the 36–40 years (30%) and 51–55 years (29.5%) age groups, suggesting increased vulnerability in midlife possibly due to lifestyle and genetic factors.
- HbA1c was significantly elevated in T2DM patients (6.86 ± 0.21%) compared to controls (5.215 ± 0.33%).
- Fasting Blood Sugar (FBS) also showed a marked increase (130.36 ± 2.69 mg/dL in diabetics vs. 102.45 ± 9.39 mg/dL in controls).

Declaration by Authors

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