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Investigating the predisposing factors for type 2 diabetes: An institutional study

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Abstract

Introduction: Type 2 Diabetes Mellitus (T2DM) is a significant public health concern with multifaceted etiology. This study aimed to uncover the predisposing factors for T2DM within an institutional setting at Mamata Medical College, Khammam.

Material and Methods: A cross-sectional observational design was employed, encompassing 100 patients from the outpatient Department of General Medicine, Mamata Medical College. Participants were assessed for demographic details, lifestyle habits, clinical measurements, treatment patterns, and associated complications. Data were statistically analyzed using descriptive and inferential methods.

Results: The mean age of participants was 52 years, with a male predominance (60%). Key findings included an average BMI of 28.4, indicating an overweight status, and 55% of participants reporting physical inactivity. Dietary habits revealed 25% regular soft drink consumption and 40% weekly fast food intake. Clinically, the mean fasting blood glucose level was 126 mg/dL, and the average HbA1c was 6.8%. About 45% had a family history of T2DM. Treatment modalities varied, with 50% on oral hypoglycemic agents. Complications observed were diabetic retinopathy (10%) and neuropathy (25%), with 35% having associated cardiovascular disease.

Conclusion: The study emphasizes the interplay of lifestyle, genetic predisposition, and clinical factors in the context of T2DM. Findings underscore the need for targeted interventions, encompassing lifestyle modifications and patient education, within institutional settings.

Keywords: Type 2 Diabetes Mellitus, Risk Factors, Institutional Study, Lifestyle Habits, Treatment Patterns, Complications

Introduction

Type 2 diabetes mellitus (T2DM) is a global health concern, affecting millions of individuals across varied age groups, ethnicities, and socioeconomic backgrounds. As of the early 21st century, the World Health Organization estimated that nearly half a billion people worldwide were living with diabetes, with T2DM accounting for around 90% of these cases [1]. The burden of this disease is not just limited to its direct impacts on health but extends to economic, social, and healthcare system repercussions.

The etiology of T2DM is multifactorial. It is characterized by insulin resistance, where the body does not effectively utilize the insulin it produces, leading to elevated blood sugar levels. Numerous risk factors, both modifiable and non-modifiable, have been identified in the onset and progression of T2DM. Modifiable risk factors include obesity, physical inactivity, poor diet, and smoking, while non-modifiable risks encompass age, genetics, ethnicity, and a history of gestational diabetes [2].

Institutional settings, such as university campuses, workplaces, or healthcare facilities, present unique environments where lifestyle behaviors and health determinants might differ from the general population. These settings can influence the dietary habits, physical activity levels, stress factors, and health-seeking behaviors of individuals [3]. Investigating the predisposing factors for T2DM within an institutional context can provide crucial insights into targeted interventions and preventive measures tailored to such environments.

The importance of understanding the disease's risk factors in specific settings cannot be overstated. For instance, an institution may have its food service, physical activity facilities, or health programs, each of which could play a significant role in either exacerbating or mitigating T2DM risks. Moreover, the demographic makeup of an institution, such as age distribution, ethnicity, and socioeconomic status, can further influence the prevalence and risk factors associated with T2DM [4].

This study aims to delve into the predisposing factors for T2DM within our institution, offering a detailed analysis that might shed light on potential interventions and preventive strategies. By focusing on an institutional setting, we hope to uncover unique patterns and associations that could provide a blueprint for other similar institutions aiming to reduce the incidence of T2DM and promote overall health and well-being.

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Materials and Methods

This was a cross-sectional observational study conducted at the Department of General Medicine, Mamata Medical College, Khammam. A total of 100 patients attending the outpatient department (OPD) of General Medicine at Mamata Medical College, who were either diagnosed with type 2 diabetes mellitus (T2DM) or were at high risk of developing the condition, were included in the study.

Inclusion Criteria

- Patients aged between 30 to 70 years.
- Patients diagnosed with T2DM or presenting with symptoms suggestive of T2DM.
- Patients willing to participate and provide informed consent.

Exclusion Criteria

- Patients with type 1 diabetes or secondary diabetes.
- Pregnant women.
- Patients with serious comorbid conditions that could interfere with the study results.

Data Collection

A structured questionnaire was administered to each participant. The questionnaire comprised sections on:

Demographics: Age, gender, occupation, educational level, and socioeconomic status.

Clinical History: Duration of diabetes, current treatments, any known complications, and family history of diabetes.

Lifestyle Factors: Dietary habits, physical activity levels, smoking, and alcohol consumption.

Anthropometric Measurements: Height, weight, body mass index (BMI), and waist-to-hip ratio.

Blood samples were also collected from the participants after an overnight fast to assess fasting blood glucose levels and HbA1c values.

Statistical Analysis: A p-value of less than 0.05 was considered statistically significant. All statistical analyses were conducted using SPSS software.

Results

Table 1 presents the demographic characteristics of the study participants. The mean age of the patients was 52 years, and there was a higher representation of males (60%) compared to females (40%).

Table 1: Demographic and Clinical Characteristics

Parameters	Results
Mean Age (years)	52
Gender (Male: Female)	60:40

Table 2: Lifestyle and Anthropometric Measurements

Parameters	Results
Mean BMI	28.4
Smokers (%)	20
Alcohol Consumption (%)	30
Physical Inactivity (%)	55

Table 2 showcases the lifestyle habits and anthropometric measurements of the study population. The average BMI indicates that participants are generally overweight. Additionally, 20% of participants reported smoking, 30% consumed alcohol, and over half (55%) admitted to leading a physically inactive lifestyle.

Table 3 delves into the clinical measurements and family predispositions of the participants. A significant 45% of participants reported a family history of type 2 diabetes. The average fasting blood glucose level was 126 mg/dL, which is indicative of diabetes. The mean HbA1c level was 6.8%, further suggesting poor glycemic control among the participants.

Table 3: Clinical Measurements and Family History

Parameters	Results
Family History of T2DM (%)	45
Mean Fasting Blood Glucose (mg/dL)	126
Mean HbA1c (%)	6.8

Table 4: Dietary Habits of Participants

Parameters	Results
Regular Soft Drink Consumption (%)	23
Consumes Fast Food Weekly (%)	41
Vegetarian Diet (%)	16

Table 4 illustrates the dietary habits of the study participants. A quarter of the participants reported regular soft drink consumption, while 41% consumed fast food on a weekly basis. Only 16% followed a vegetarian diet.

Table 5: Medication and Treatment Patterns

Parameters	Results
On Oral Hypoglycemic Agents (%)	52
On Insulin Therapy (%)	16
On Combined Therapy (%)	32

Table 5 provides insights into the treatment patterns of the participants. More than half of them were on oral hypoglycemic agents, 16% were on insulin therapy, and 32% were on a combination of both.

Table 6: Complications and Comorbidities

Parameters	Results
Presence of Diabetic Retinopathy (%)	11
Presence of Diabetic Neuropathy (%)	24
Has Cardiovascular Disease (%)	35

Table 6 highlights the complications and comorbidities among the study participants. 10% had diabetic retinopathy, 24% presented with diabetic neuropathy, and 35% had associated cardiovascular disease.

Discussion

The current study, conducted at Mamata Medical College, Khammam, aimed to uncover the predisposing factors for Type 2 Diabetes Mellitus (T2DM) within an institutional setting. The findings provide critical insights into the demographic, lifestyle, clinical, and treatment patterns associated with T2DM, emphasizing the multifaceted nature of this chronic condition.

Our study revealed a mean age of 52 years among participants, aligning with previous research indicating that T2DM is more prevalent in middle-aged and older adults (5). The gender

distribution showed a higher representation of males. This contrasts with some global data suggesting a roughly equal distribution between genders, though regional variations are noted [6].

The observed mean BMI of 28.4 classifies the average participant as overweight. Obesity and overweight status are well-established risk factors for T2DM due to their association with insulin resistance [7]. The consumption patterns, with 25% reporting regular soft drink intake and 41% consuming fast food weekly, are concerning. High sugar and calorie-dense foods have been linked to increased T2DM risk [8]. Additionally, the reported physical inactivity among 55% of participants is alarming, given that regular physical activity can enhance insulin sensitivity and aid in glycemic control [9].

The fact that 45% of participants had a family history of T2DM underscores the genetic predisposition often seen in T2DM patients [10]. The recorded mean fasting blood glucose level and HbA1c value pointed towards poor glycemic control, emphasizing the need for robust intervention strategies.

Treatment modalities varied among participants. While half were on oral hypoglycemic agents, substantial proportions were on combined therapy. This might indicate the progressive nature of T2DM, where monotherapy becomes insufficient over time [11].

The prevalence of diabetic complications, such as retinopathy and neuropathy, reiterates the importance of early diagnosis and management to prevent these debilitating consequences [12]. Moreover, the high incidence of cardiovascular disease among participants is consistent with literature citing cardiovascular diseases as leading comorbidities with T2DM [13].

To conclude, our study at Mamata Medical College sheds light on the intricate interplay of various factors contributing to T2DM. It underscores the importance of targeted interventions, encompassing lifestyle modifications, regular screenings, and patient education, to tackle this burgeoning health challenge. Further longitudinal studies across diverse settings would augment our understanding and aid in devising comprehensive diabetes management strategies.

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