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Evaluation of Treatment Patterns and Complication Profile among Type 2 Diabetes Mellitus Patients in a Hospital Setting

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KEYWORDS
Diabetes Mellitus, Treatment pattern, Complications, Drug utilization

ABSTRACT:

Background:

Type 2 Diabetes Mellitus (T2DM) is a rapidly increasing chronic metabolic disorder associated with significant morbidity and mortality due to its complications and co-morbid conditions. Understanding patient characteristics, treatment patterns, and complications is essential for effective disease management.

Objective:

To evaluate the socio-demographic profile, co-morbidities, treatment patterns, and complications among patients with Type 2 Diabetes Mellitus in a tertiary care hospital.

Methods:

A cross-sectional study was conducted among 469 patients diagnosed with T2DM. Data regarding demographic characteristics, duration of diabetes, co-morbidities, drug utilization, treatment approaches, and complications were collected and analyzed using descriptive statistics.

Results:

The majority of patients belonged to the 61–70 years age group (37.31%), with a male predominance (54.79%). Most patients had secondary education (47.97%) and were from rural areas (61.41%). A significant proportion had diabetes for 5–10 years (48.40%).

Co-morbidities were common, with hypertension (33.42%), dyslipidemia (23.79%), and thyroid disorders (20.11%) being the most prevalent.

Metformin (28.3%) was the most frequently prescribed drug, followed by sulfonylureas (27.2%) and insulin (17.5%). Combination therapy was more commonly used than monotherapy.

The most common complications observed were slow wound healing (14.68%), neuropathy (14.12%), and diabetic foot (11.99%), with most complications showing a slight male predominance.

Conclusion:

T2DM is highly prevalent among the elderly population and is frequently associated with multiple co-morbidities and complications. The study highlights the importance of early detection, rational pharmacotherapy, and regular monitoring to prevent complications and improve patient outcomes. Strengthening awareness and healthcare access, especially in rural areas, is crucial for better disease management.

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INTRODUCTION

Diabetes Mellitus is a chronic metabolic disorder characterized by persistent hyperglycemia resulting from defects in insulin secretion, insulin action, or both[1]. Among its various types, Type 2 Diabetes Mellitus (T2DM) is the most prevalent, accounting for the majority of cases worldwide[2]. It has emerged as a major public health concern due to its rapidly increasing prevalence, particularly in developing countries such as India[3].

The rising burden of T2DM is largely attributed to urbanization, sedentary lifestyle, unhealthy dietary habits, obesity, and population aging[2,4]. India is often referred to as the "diabetes capital of the world," with a significant proportion of the population affected by the disease[6]. The condition imposes a substantial economic burden on individuals and healthcare systems and contributes to increased morbidity and mortality due to its long-term complications[8].

T2DM is commonly associated with several co-morbid conditions, including hypertension, dyslipidemia, and thyroid disorders, which further complicate disease management[9,10]. In addition, prolonged uncontrolled diabetes can lead to microvascular complications such as neuropathy, nephropathy, and retinopathy, as well as macrovascular complications like coronary artery disease and stroke[11,12]. Early identification and effective management of these conditions are essential to prevent disease progression and improve patient outcomes[15].

Management of T2DM involves a combination of lifestyle modification and pharmacological therapy13. A wide range of antidiabetic drugs, including biguanides, sulfonylureas, insulin, and newer agents such as SGLT2 inhibitors and DPP-4 inhibitors, are available for glycemic control[5,14]. The choice of therapy often depends on patient-specific factors, disease duration, presence of co-morbidities, and risk of complications[13,14]. Evaluating prescribing patterns and treatment approaches is therefore crucial for promoting rational drug use16.

Understanding the socio-demographic profile, clinical characteristics, treatment patterns, and complication status of diabetic patients is essential for developing targeted interventions and improving healthcare delivery[6]. Hospital-based studies provide valuable insights into real-world practices and patient outcomes[17]. Hence, the present study was undertaken to assess the demographic distribution, co-morbidities, drug utilization patterns, and complications among patients with Type 2 Diabetes Mellitus in a tertiary care hospital setting.

The aim of the study to evaluate the prescription pattern and complications in type II diabetic patients.The objectives of this study are Study the relationship between social factors and complications in diabetes population. Examine types of medications used for diabetes. Analyze the Lab Parameters approaches.Analyze the frequency and simultaneous occurrence of comorbid conditions in individuals with T2DM.

METHODOLOGY

The study was conducted in a 450-bedded multispecialty tertiary care teaching hospital located in Chalakudy, Thrissur, Kerala. It was a prospective Interventional study.The study was conducted in the General medicine, Cardiology, orthopedics, Surgery and Gynecology departments for 36 months in 469 patiemts Tools used Data entry form**,** Informed patient consent form,Patient information leaflet, counselling Aids**.**Patients who are admitted in General medicine, Cardiology, Orthopedics, Surgery and Gynecology departments and diagnosed with T2DM for not less than 6 months and age not less than 20 year of either sex were included in this study. Pediatrics and Psychiatry patients., Patients with Type 1DM and those who are not willing to participate in the study were excluded from this study.

RESULTS AND DISCUSSION

The age-wise distribution of diabetic patients in this study (n = 469) revealed that the highest proportion of cases was observed in the 61–70 years age group (37.31%), followed by the 51–60 years group (23.88%). The lowest proportions were noted among patients aged >80 years (7.88%) and <40 years (9.59%). Gender-wise distribution showed a slight male predominance, with males accounting for 54.79% of cases and females comprising 45.20%. Analysis of educational status indicated that the majority of patients had completed secondary school education (47.97%), followed by diploma holders (23.24%) and those with primary education (17.48%), while the least proportion had a degree or higher qualification (11.30%). With regard to

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marital status, most patients were married (72.92%), whereas 27.08% were unmarried. Department-wise distribution demonstrated that the highest number of cases were reported in General Medicine (45.41%), followed by Surgery (21.74%) and Orthopedics (20.89%), while Cardiology (9.38%) and Gynecology (2.55%) accounted for the lowest proportions.

Distribution based on social habits showed that 39.23% of patients had no such habits, while 23.88% consumed alcohol, 16.41% were smokers, and 20.46% reported both habits. Regarding the duration of diabetes, the majority of patients had the condition for 5–10 years (48.40%), followed by less than 5 years (36.25%), while only 15.35% had diabetes for more than 10 years. In terms of place of residence, 61.41% of patients were from rural areas and 38.59% from urban areas.

Lifestyle assessment revealed that most patients had a non-sedentary lifestyle (66.52%), whereas 33.47% were sedentary. Employment status indicated that 52.66% of patients were employed, while 47.34% were unemployed. Finally, with respect to comorbidities, the majority of patients had more than two comorbid conditions (40.51%), followed by those with one comorbidity (34.75%), while 24.73% had no comorbidities.

The study analysed different types of comorbidities among diabetic patients. The most common co-morbidity was hypertension (33.42%), followed by dyslipidemia (23.79%) and thyroid disorders (20.11%), while periarthritis (1.98%) and ulcers/CTS (2.54% each) were the least common followed by stroke and UTI(9% each)

DISTRIBUTION BASED ON ANTI DIABETIC DRUGS

Table 1: Distribution based on antidiabetic drugs

DRUG CLASS	DRUG NAME	NUMBER OF DRUGS	PERCENT (%)
SGLT2 Inhibitors	Dapagliflozin	74	8.0
Insulin		162	17.5
Biguanides	Metformin	262	28.3
Sulfonylureas	Glimepiride	234	25.3
	Gliclazide	13	1.4
	Glibenclamide	5	0.5
DPP-4 Inhibitors	Vildagliptin	76	8.2
	Sitagliptin	43	4.6
	Teneligliptin	9	1.0
	Linagliptin	10	1.1
Alpha- glucosidase Inhibitors	Voglibose	33	3.6
Thiazolidinediones	Pioglitazone	5	0.5

Table 1 shows distribution based on antidiabetic drugs, Metformin (28.3%) was the most frequently prescribed drug, followed by Sulfonylureas (27.2%), including Glimepiride (25.3%), Gliclazide (1.4%), and Glibenclamide (0.5%). Insulin usage accounted for 17.5%, while SGLT2 inhibitors like Dapagliflozin contributed 8.0%. Among DPP-4 inhibitors (14.9%), Vildagliptin (8.2%) was the most used, followed by

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Sitagliptin (4.6%), Teneligliptin (1.0%), and Linagliptin (1.1%). Alpha-glucosidase inhibitors, such as Voglibose, accounted for 3.6%, while Thiazolidinediones (Pioglitazone) had the lowest usage at 0.5%.

DISTRIBUTION BASED ON TREATMENT APPROACH OF ANTIDIABETIC MEDICATION

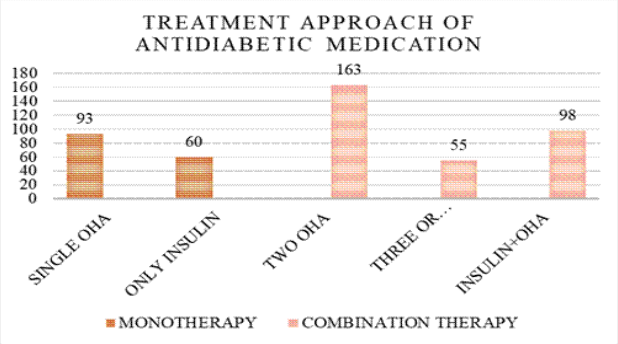

Figure 1: Distribution based on treatment approach of antidiabetic medication

Figure 1 shows treatment approach of antidiabetic medication. Monotherapy was used in 153 cases, with Single OHA being more common (59.3%) than insulin alone (40.7%). Combination therapy was used in 316 cases, with Two OHA (51.2%) being the most frequent, followed by Insulin + OHA (31.3%) and Three or More OHA (17.4%).

DISTRIBUTION BASED ON COMPLICATIONS

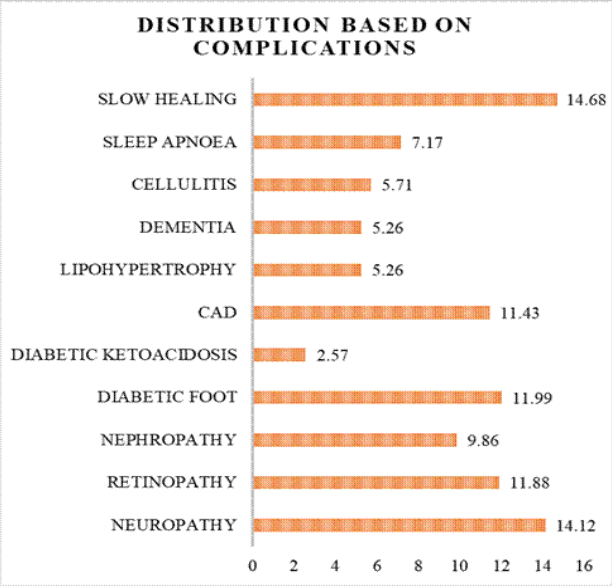

Figure 2: Distribution based on complications

Figure 2 shows pattern of complications. The most common complication was slow healing (14.68%), followed by neuropathy (14.12%) and diabetic foot (11.99%). Retinopathy (11.88%) and coronary artery disease (CAD) (11.43%) were also prevalent. Nephropathy accounted for 9.86%, while sleep apnea (7.17%), cellulitis (5.71%), lipohypertrophy (5.26%), and dementia (5.26%) were less common. The least reported complication was diabetic ketoacidosis (2.57%).

DISTRIBUTION OF COMPLICATION BASED ONGENDER

Table 2: Distribution based on complications based on gender

COMPLICATION	FEMALE	MALE
NEUROPATHY	48	78
RETINOPATHY	49	57
NEPHROPAHY	39	49
DIABETIC FOOT	50	57
DIABETIC KETOACIDOSIS	11	12
CAD	53	49
LIPOHYPERTROPHY	21	26
CELLULITIS	20	27
DEMENTIA	20	31
SLEEP APNOEA	31	33
SLOW HEALING	62	69

Table 2 shows distribution of complications based on gender. Neuropathy was more common in males (78) than females (48), as was retinopathy (57 vs. 49) and nephropathy (49 vs. 39). Diabetic foot cases were slightly higher in males (57) than females (50), while diabetic ketoacidosis was nearly equal (12 vs. 11). Coronary artery disease (CAD) was more frequent in females (53) than males (49). Other complications, such as lipohypertrophy (26 vs. 21), cellulitis (27 vs. 20), dementia (31 vs. 20), sleep apnea (33 vs. 31), and slow

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healing (69 vs. 62), were all slightly more common in males.

SUMMARY

This cross-sectional study was conducted among 469 patients with Type 2 Diabetes Mellitus to evaluate their socio-demographic characteristics, clinical profile, treatment patterns, and associated complications[1].

The majority of patients belonged to the 61–70 years age group, indicating a higher prevalence of diabetes in the elderly population[8]. A male predominance was observed9. Most patients had secondary level education, and a significant proportion were married. The majority were from rural areas, with a higher proportion leading a non-sedentary lifestyle and being employed[6].

Regarding clinical characteristics, most patients had a duration of diabetes between 5–10 years. A considerable number of patients presented with multiple co-morbidities, with hypertension, dyslipidemia, and thyroid disorders being the most common [9,10].

In terms of drug utilization, metformin was the most frequently prescribed antidiabetic agent, followed by sulfonylureas and insulin therapy[1],[19]. Among newer drug classes, SGLT2 inhibitors and DPP-4 inhibitors were also utilized, though to a lesser extent[5]. Combination therapy was more commonly employed than monotherapy, with two-drug regimens being the most frequent [17].

The study also highlighted a significant burden of complications, with slow wound healing, neuropathy, and diabetic foot being the most common [11,20] Other notable complications included retinopathy, coronary artery disease, and nephropathy [12,21]. Most complications showed a slight male predominance, except for coronary artery disease, which was more frequent in females.

CONCLUSION

The present study demonstrates that Type 2 Diabetes Mellitus predominantly affects the elderly population and is commonly associated with multiple co-morbid conditions, particularly hypertension and dyslipidemia [18,9]. The findings emphasize the widespread use of metformin-based combination therapy as the cornerstone of diabetes management[1],[19].

The high prevalence of chronic complications, especially those related to poor glycemic control such as neuropathy and delayed wound healing, underscores the need for early diagnosis, regular monitoring, and effective management strategies[15].

Furthermore, the notable proportion of patients from rural areas highlights the importance of improving healthcare accessibility and awareness programs in these regions[6].

Overall, a comprehensive, patient-centered approach focusing on lifestyle modification, rational drug therapy, and timely screening for complications is essential to reduce the disease burden and improve the quality of life among diabetic patients[13].

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