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Research Article

An Observational Study to Evaluate Demographic Variables, Clinical Characteristics of Type 2 Diabetes Mellitus Patients Reporting to a Healthcare Facility in Iraq

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Abstract

Type 2 diabetes mellitus (T2DM) accounts for approximately 90% of all types of diabetes, making it very common. The objective of the study was to assess the effects of demographic variables, clinical characteristics on glycaemic control amongst patients of T2DM in Iraq. We conducted an open-label, multi-centric observational study to evaluate the demographic variables and clinical characteristics of T2DM patients reporting to a healthcare facility in Iraq and on oral anti-diabetes medications, such as metformin, DPP-4 inhibitor, SGLT-2 inhibitor, insulin, and/or sulfonylurea therapy. Both newly diagnosed and previously diagnosed T2DM Iraqi patients were included. The demographic and anthropometric data, including age, weight, height, gender, and smoking habits, clinical characteristics (duration of diabetes, HbA1c, FBG, PPBG), associated comorbidities, and anti-diabetes medications, were recorded through a Case Record Form at a single time point. Statistical analysis was done by t test analysis, and a p value of ≤ 0.05 was considered statistically significant. A total of 1164 adults were included. The mean HbA1c in patients without comorbidities was lower than in those with comorbidities. There was a statistically significant difference in mean HbA1c between patients with and without hypertension (P=0.005), dyslipidaemia (P=0.005), renal disease (P<0.0001), and diabetic foot ulcer (P<0.0001). The glucose-lowering effects of medications lowered with increment in duration since diabetes onset. There was a significant difference in mean HbA1c of patients with diabetes duration of <6 months and >6 months (P=0.000). The glycaemic control in patients with smoking habits was poor. We can conclude the presence of comorbidities and smoking leads to poor glycaemic control. In addition, the duration of diabetes affects the efficacy of the treatment, and those with recent onset have better glycaemic control. Therefore, these factors need consideration while treating T2DM patients.

Keywords: Dipeptidyl peptidase-4 inhibitors, Type 2 diabetes mellitus, Sodium-glucose cotransporter-2 inhibitors, Smoking, Dyslipidaemia, Sulfonylureas.

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Contents

1. Introduction

Type 2 diabetes mellitus (T2DM) accounts for approximately 90% of all types of diabetes, making it very common [1]. Globally, about 537 million adults aged 20 to 79 years are living with diabetes, out of which 1.4 million are Iraqis [1, 2]. The global prevalence of diabetes is projected to rise to 643 million by 2030, as per the 2021 reports by the International Diabetes Federation [1]. The World Health Organization (WHO) data indicates that diabetes was among the top ten causes of death in 2019 [2].In the Middle East and North African (MENA)region (21 countries and territories, including Iraq), diabetes is estimated to cause 3,73,557 deaths, out of which about 51.8% are due to those under 60 years of age. This makes the MENA region the second highest among IDF regions. Although the prevalence of diabetes is high in the MENA regions, there is a dearth of data on the progression and complications associated with diabetes in these populations. Only 2.9% of global diabetes expenses are invested in the MENA region [3].Due to the lack of adequate epidemiological studies and randomised controlled trials on T2DM in Iraqi patients, it is difficult to understand the prevalence of T2DM and the effective therapies for its management in Iraq [3].This highlights the need for greater research, data analysis and awareness in the MENA regions.

Various well-established factors increase the risk of T2DM. These are prediabetes, obesity, smoking, family history of type 2 diabetes, lack of physical activity (less than 3 times a week) and gestational diabetes [4]. Smoking is a factor that can increase the risk of T2DM by 30% to 40%. It can also lead to insulin resistance and interfere with glycaemic control [5]. Nicotine in cigarettes reduces the effectiveness of insulin, creating a need for more insulin to regulate blood glucose levels [5, 6]. As compared to the general population, smoking causes much higher morbidity and mortality in those with T2DM. As is well-known, poor glycaemic control can increase the risk of cardiovascular disease, stroke, lower limb amputation, blindness, and renal failure [5, 6].Spreading awareness regarding quitting smoking to prevent and manage T2DM is therefore essential.

Numerous complications are associated with poorly controlled T2DM, including cardiovascular disease and diabetic nephropathy, retinopathy, and neuropathy. Previously undiagnosed diabetes patients had a higher rate of complications than non-diabetes patients. About 25% of diabetes patients have retinopathy at the time of diagnosis; published literature demonstrated 15% to 55% of diabetes patients have diabetic retinopathy, macular oedema and/or proliferative retinopathy [7].

Metformin and sulfonylureas are the most used oral medications for T2DM [1]. Dipeptidyl peptidase-4 (DPP-4) inhibitors and sodium-glucose cotransporter-2 (SGLT-2) inhibitors are other currently available therapies for managing diabetes; they can be used as monotherapy or dual or triple combination therapies [8].Guidelines recommend DPP-4 inhibitors as add-on to metformin or other glucose-lowering agents in dual or triple therapy [9].DPP-4 inhibitors have increasingly replaced sulfonylureas as second line therapy after metformin failure and many metformin/DPP-4 inhibitor fixed dose combinations are available. In later stages of type 2 diabetes, DPP-4 inhibitors are also recommended in the guidelines in triple therapies with metformin and SGLT-2 inhibitors or with metformin and insulin [10].

As per the published Standards of Medical Care in Diabetes – 2022 by the American Diabetes Association (ADA) recommends metformin as the treatment of choice for managing diabetes. The guideline also recommends SGLT-2 inhibitors and GLP-1 RA along with or instead of metformin. These medicines can also be prescribed to people with comorbidities such as heart failure, chronic renal disease, high risk of atherosclerosis and cardiovascular diseases [11]. The European Society of Cardiology (ESC) 2019, guideline recommends metformin as first-line therapy for diabetes. It recommends

considering metformin in overweight diabetes patients without cardiovascular disease or those at moderate risk of cardiovascular disease. In addition, the ESC guidelines recommended SGLT2 inhibitors (canagliflozin, empagliflozin or dapagliflozin) to lower the risk of hospitalisation due to cardiac failure. Empagliflozin, canagliflozin, dapagliflozin, liraglutide, semaglutide, or dulaglutide are recommended in patients with T2DM and cardiovascular disease or at high or very high cardiovascular risk to reduce cardiovascular events; empagliflozin or liraglutide are recommended in patients with T2DM and cardiovascular disease to reduce the risk of death.

DPP4 inhibitors like sitagliptin and linagliptin have neutral effects on heart failure and can be considered for treatment. However, saxagliptin is not recommended in patients with T2DM and a high risk of cardiac failure [12]. DPP-4 inhibitors significantly improve total cholesterol and low-density lipoprotein cholesterol (LDL-C), whereas SGLT-2 inhibitors significantly increase high-density lipoprotein cholesterol (HDL-C) and apolipoprotein A. As dyslipidaemia is known to increase the risk of cardiovascular disease in patients with T2DM, DPP-4 inhibitors and SGLT-2 inhibitors may benefit patients with T2DM for cardiovascular disease [8].

There is a high prevalence of T2DM in Iraq. However, there is a lack of data from adequate epidemiological studies and randomised controlled trials in Iraqi patients [3].Therefore, we conducted an open-label, multi-centric study to assess the effects of commonly prescribed anti-diabetes medications in Iraq and the changes in their glycaemic control based on smoking status of patients, their comorbidities, and duration since onset of T2DM.To our knowledge, this is the first study to investigate this effect in Iraqi patients.

2. Methodology

We conducted an open-label, mult-centric, prospective observational study to evaluate the demographic variables and clinical characteristics of T2DM patients reporting to a healthcare facility in Iraq and on oral anti-diabetes medications, such as metformin, DPP-4 inhibitor, SGLT-2 inhibitor, insulin, and/or sulfonylureatherapy. The study included both newly diagnosed and previously diagnosed T2DM patients attending the department of diabetology/ endocrinology or in hospitals or clinics in Iraq.

All doctors conducted the study in compliance with the rules and regulations enforced in Iraq. Patients were evaluated for detailed history, examination, and laboratory investigations. The demographic and anthropometric characteristics and other relevant data of the patients were recorded through a Case Record Form (CRF) at a single time point. Variables recorded in the study were age, weight, height, gender, smoking habits, clinical characteristics such as duration of diabetes, glycated hemoglobin A1C (HbA1c), fasting blood glucose (FBG), postprandial blood glucose (PPBG) and associated comorbidities, and ongoing anti-diabetes medications.

The initial drug prescribed for managing diabetes and the percentage of previously diagnosed T2DM patients with uncontrolled diabetes at the first visit were captured. Patients with and without comorbidities were included. Comorbidities acceptable in the inclusion criteria were hypertension, dyslipidaemia, diabetic foot ulcer, and renal disease. Any other complications of the patients were noted, and the patient was considered for the study based on the physician's discretion. Pregnant women, lactating mothers, patients on dialysis, and patients with type 1 diabetes were excluded from this observational study.

Smoking habits were captured as non-smokers (not smoked since a year minimum), regular (daily minimum one cigarette), or occasional (2-3 cigarettes in a week). Hypertension was defined as systolic blood pressure of ≥140 mmHg, diastolic blood pressure ≥90 mmHg or the current use of antihypertensive medications [8]. Dyslipidaemia was defined as an imbalance of lipids such as low-density cholesterol, high-density cholesterol, triglycerides, and cholesterol [13]. The evaluation for the presence or absence of diabetic foot ulcer and renal disease was based on the physician's discretion. Statistical analysis was done by t-test analysis, and a p-value of ≤0.05 was considered statistically significant.

Table 1: Baseline Demographics

Baseline Demographics	Mean (Standard Deviation) (N=1164)
Weight (kg)	86.39 (23.402)
Height (cm)	165.78 (12.879)
Age (years)	57.26 (13.577)

N: Total number of patients in the study.

3. Results

A total of 1164 adult patients [547 (47%) women and 617 (53%) men] were included in this observational study. Mean age of patients was 57 years. The patient demographics were as seen in Table 1.The duration from diabetes onset, smoking status, and presence/absence of comorbidities was recorded, and the details are provided in Tables2, 3, and 4, respectively. The duration of diabetes in a majority of patients was 6 months to 5 years [N= 529 (45.45%)], followed by 5-10 years, <6 months, 10-20 years, and >20 years (Table 2). Most patients were non-smokers, followed by regular and occasional smokers (Table 3). Hypertension was the most common comorbidity observed amongst the T2DM patients. Fewer patients suffered from renal disease and diabetic foot ulcers in comparison to hypertension.

Table 2: Duration from Diabetes Onset

Duration from the onset of diabetes	Number of patients (N=1164), n (%)
<6 months	169 (14.52)
6 months to 5 years	529 (45.45)
5 to 10 years	291 (25.00)
10 to 20 years	135 (11.60)
>20 years	40 (3.44)

N: Total number of patients in the study.

Table 3: Smoking status of the patients

Smoking status	Number of patients (N=1164), n (%)
Non-smoker	751 (64.52)
Occasional smoker	186 (15.98)
Regular smoker	227 (19.50)

N: Total number of patients in the study

As demonstrated in Figure 1, the anti-diabetes treatments ongoing in the patient population during data collection in this study included metformin, DPP-4 inhibitors, sulfonylureas, SGLT-2 inhibitors, and/or insulin. Analysis shows that most patients received metformin followed by DDP-4 inhibitors and sulfonylureas. The least common medication used were SGLT-2 inhibitors.

Table 4: Presence or Absence of Comorbidity/Comorbidities.

Comorbidities		Number of patients (N=1164), n (%)
Hypertension	Yes	752 (64.60)
	No	412 (35.40)
Dyslipidaemia	Yes	586 (50.34)
	No	578 (49.66)
Renal disease	Yes	162 (13.92)
	No	1002 (86.08)
Diabetic foot ulcer	Yes	82 (7.04)
	No	1082 (92.96)

N: Total number of patients in the study.

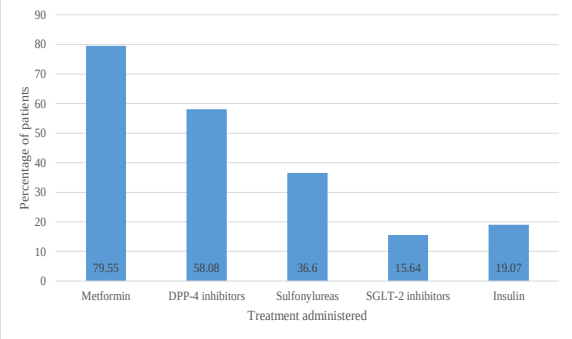


Figure 1: Antidiabetes Therapy Administered – Percentage of Patients (N=1164)

The percentage of patients receiving a particular antidiabetes medication.

DPP-4: Dipeptidyl peptidase-4; **N:** Total number of patients in the study; **SGLT-2:** Sodium-glucose cotransporter-2. There was no significant difference in mean values of HbA1c (8.43% versus 8.66%), FBG(175.31 mg/dL versus 177.02 mg/dL) and PPBG (235.96 mg/dL versus 231.34 mg/dL) between men and women (P>0.05). The effects of various factors, including smoking status, presence or absence of comorbidities, and duration from onset of diabetes, on T2DM, are indicated in Tables 5, 6 and 7, respectively.

Table 5: Effects of Smoking Status on Glycaemic Parameters.

Glycaemic parameters	Smoking Status	N (N=1164)	Mean (SD)	SE	P-value
HbA1c (%)	Regular	227	8.70 (2.45)	0.16	0.333
	Occasional	186	8.37 (2.24)	0.16	
	Non-smoker	751	8.53 (2.27)	0.08	
FBG (mg/dL)	Regular	227	188.20 (80.71)	5.36	0.020
	Occasional	186	171.22 (65.41)	4.80	
	Non-smoker	751	173.67 (72.80)	2.66	
PPBG (mg/dL)	Regular	227	239.37 (88.52)	5.88	0.534
	Occasional	186	230.38 (85.76)	6.29	
	Non-smoker	751	239.94 (88.78)	3.24	

FBG: Fasting blood glucose; **HbA1c:** Glycosylated haemoglobin; **N:** Total number of patients in the study; **PPBG:** Postprandial blood glucose; **SD:** Standard Deviation; **SE:** Standard Error.

The glycaemic control in patients with regular and occasional smoking habits was poor as compared to non-smokers. Although there was no statistically significant difference in mean HbA1c (P=0.333) and PPBG (P=0.534) values of regular smokers, occasional smokers and non-smokers, a statistically significant difference in improvement was noted in their FBG (P=0.020) values. Comorbidities in T2DM impacted the glycaemic control of

anti-diabetes therapies. As indicated in Figure 2, the mean HbA1c values in T2DM patients without comorbidities were lower than those with comorbidities. Mean HbA1c values were 8.68% versus 8.28%, 8.73% versus 8.35%, 9.58% versus 8.37% and 10.08% versus 8.42% in patients with and without hypertension, dyslipidaemia, renal disease, and diabetic foot ulcer, respectively. In addition, there was a statistically significant difference in mean HbA1c values between patients without hypertension (P=0.005), dyslipidaemia (P=0.005), renal disease (P<0.0001), and diabetic foot ulcer (P<0.0001) and those with these conditions.

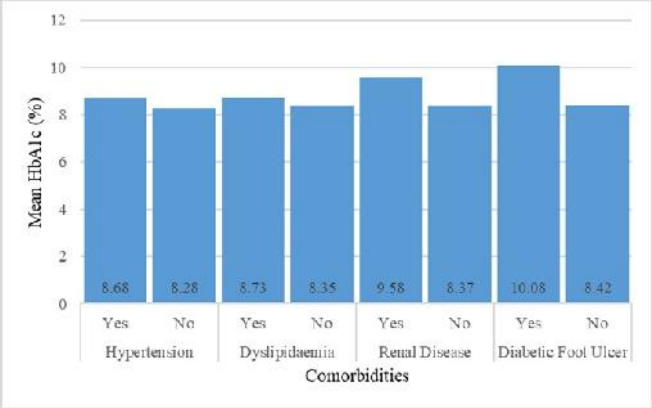
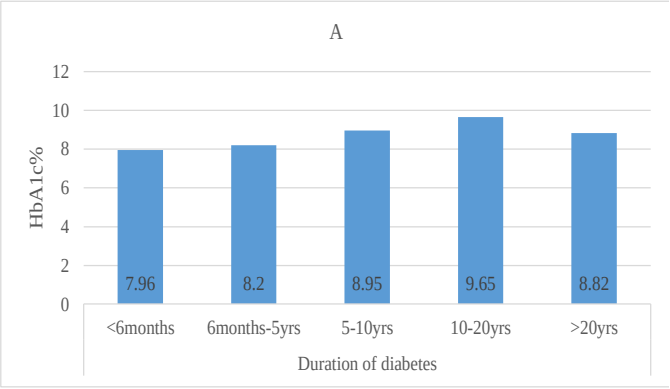


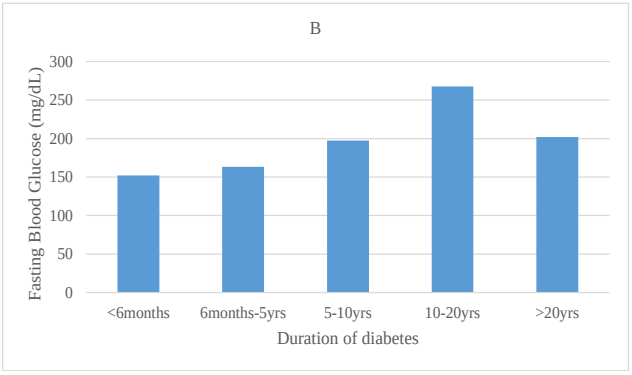
Figure 2: Presence of Comorbidities And their Effects on Glycosylated Haemoglobin (HbA1c) (%).

The effect of comorbidities (hypertension, dyslipidaemia, renal disease, or diabetic foot ulcer) on the glycosylated haemoglobin (HbA1c) values.

HbA1c: Glycosylated haemoglobin

The duration from the onset of diabetes and glycaemic control with anti-diabetes therapies showed an inverse relationship. The glycaemic parameters showed a lower value in patients with diabetes for <6 months than those with >6 months. As the duration since onset increased, the effectiveness of anti-diabetes medicines reduced, as indicated in Figure 3 and Table 7.There was a statistically significant difference in mean HbA1c values of patients with diabetes duration of <6 months, 6 months to 5 years, 5 to 10 years, 10 to 20 years, and >20 years (all P values=0.0000).





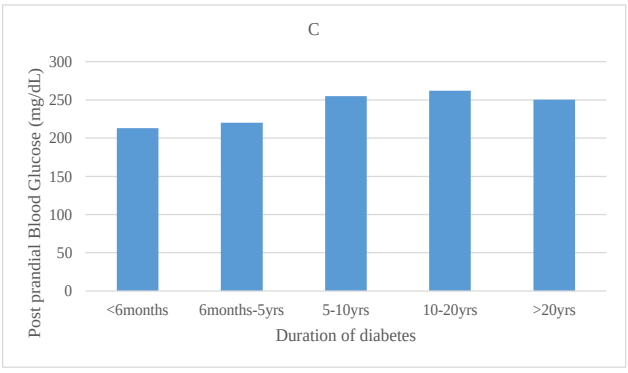


Figure 3: Duration from Onset of Diabetes and Effect of Treatment on Glycaemic Parameters (A = HbA1c, B = Fasting blood glucose and C =Postprandial blood glucose).

The duration from onset of diabetes and level of glycaemic control with anti-diabetes medications: mean HbA1c (A), FBG (B), and PPBG (C) values. mapped against the duration of diabetes.

FBG: Fasting blood glucose; **HbA1c:** Glycosylated haemoglobin; **N:** Total number of patients in the study; **PPBG:** Post-prandial blood glucose; **SD:** Standard deviation.

Discussion

In our study we evaluated the effect of factors like gender, age, weight, height and smoking habits and presence of comorbidities like hypertension, dyslipidaemia, diabetic foot ulcer and renal disorders on glycaemic control in type 2 diabetes. Our observational study found that smoking habits negatively impacted glycaemic control. Mean HbA1c values were 8.70% and 8.37% in regular and occasional smokers, respectively, whereas they were 8.53% in non-smokers. In addition, the presence of comorbidities such as hypertension, renal disease, and diabetic foot ulcer also had a significant correlation with poor HbA1c control. Mean HbA1c values were 8.68% versus 8.28%, 8.73% versus 8.35%, 9.58% versus 8.37% and 10.08% versus 8.42% in patients with and without hypertension, dyslipidaemia, renal disease, and diabetic foot ulcer, respectively. The duration of diabetes also plays a role in the effectiveness of anti-diabetes therapies; those with recent onset had better glycaemic control than others. A retrospective longitudinal analysis of data from 969,531 diabetes patients with comorbidities such as hypertension,

obesity, or chronic kidney disease (CKD) was performed by Urina-Jassir M. et al., 2021.

Multivariate model estimation in this study demonstrated that patients with T2DM have significantly higher odds of poor glycaemic control if they have comorbid conditions such as CKD or obesity. About 78% higher odds of having poor glycaemic control were observed in diabetes patients with CKD than those without CKD; the odds of having poor glycaemic control were 52% higher in diabetes patients with obesity than those without obesity. However, non-significant odds were found between hypertension and poor glycaemic control [14].

Peng K. et al., 2018, conducted a cross-sectional study on 25,848 patients (10,551 men and 15,297 women) with T2DM to assess the effects of active smoking and cessation of smoking on glycaemic control. The results indicated poor glycaemic control in smokers. Compared to non-smokers, smokers had higher levels of HbA1c, FBG, PPBG, total cholesterol, and triglycerides and lower levels of HDL-C (all P values < 0.05).Compared to non-smokers, patients with a smoking history who quit smoking for <10 years were also at higher risk of poor glycaemic control. This risk levelled off only after 10 years of quitting smoking. The study indicated that smoking habits and comorbidities, such as hypertension, overweight, obesity and dyslipidaemia, were significantly associated with poor glycaemic control [15]. It aligns with our results describing the negative correlation of smoking and presence of comorbidities on glycaemic control. Another study by Hayashino Y. et al., 2017 analysed data from 5,844 patients with T2DM and evaluated the relation between the duration of diabetes and the type of anti-diabetes therapies used.

The median diabetes duration was 3, 7, 12, and 21 years for the first to fourth quartiles. Compared with the first quartile of diabetes duration, the multivariable-adjusted odds of any anti-diabetes treatment (insulin or oral hypoglycaemic agents) for the second, third, and fourth quartiles were 2.17 (95% confidence interval [CI] 1.68-2.80), 3.39 (95% CI 2.53-4.54), 4.99, (95% CI 3.64-6.84), respectively (P for trend<0.001). Adjustment of confounders attenuated these associations. The study demonstrated that longer diabetes duration required complex diabetes therapies in patients with T2DM [16]. Our observational study corroborates these findings and indicates that since the length of duration of onset affects the effectiveness of anti-diabetes therapies, as the duration increases, a more complex treatment regimen is needed for glycaemic control.

Chaudhary DMG et al., 2019, analysed the demographic and clinical characteristics of 4556 patients with T2DM at a tertiary care hospital in Southern Punjab. About 55.9% of patients were women, and 44.1% were men. Obesity (BMI>27 kg/m^2) was found in 41.5% of patients, and central obesity was found in 80.7% and 94.7% of T2DM patients as per the waist circumference (WC) and waist hip ratio (WHR)cut-off, respectively. This study concluded that women were more prone to be obese in all parameters of obesity than men, and central obesity was more prevalent in women with T2DM than in men with T2DM. Diabetes was found to be more prevalent in women than men, especially affecting the middle age population. Hypertension and obesity are two important comorbid conditions associated with T2DM [17].

Another open-label, observational, real-life study by Selim S. et al., 2021, was conducted in numerous locations in Bangladesh in an outdoor setting in 250 drug-naive Type 2 diabetes mellitus patients. A pre-designed questionnaire was used to collect data; data were processed, analysed and disseminated. There were more men in the study than women, and the men-women ratio was 1.4:1. About 41% of the participants fell in the overweight (BMI: 25 - 30 kg/m^2) category. The majority (65%) of the patients in this study had diabetes for ≤5 years.

The mean ± SD systolic and diastolic blood pressure of participants were 137.25±17.50 and 85.16±13.39 mmHg, respectively. The mean ± SD values of FBG (mg/dL), PPBG (mg/dL), total cholesterol (mg/dL), triglycerides (mg/dL), HDL-C (mg/dL), LDL-C (mg/dL), very LDL cholesterol (VLDL-C) (mg/dL) were 251.51±112.08, 349.72±128.68, 219.59±68.25, 196.44±94.34, 35.14±11.85, 145.72±64.33, 40.88±18.12, respectively. The results suggested the requirement of greater attention from dialectologists in diagnosing and treating patients or suspected diabetes patients with obesity or hypertension. The vulnerability of getting diabetes increases with age, and those aged 50 years or older are the most vulnerable population. In addition, smoking, hypertension, family history, alcohol consumption and presence of nitrites in the urine can be considered as potential comorbidities for T2DM patients. Therefore, evaluation of demographic, clinical as well as biochemical characteristics in treatment-naïve patients with T2DM can be vital in selecting the appropriate treatment [18].

Borah M. et al., 2017, evaluated the clinical and sociodemographic characteristics of T2DM patients at a tertiary care hospital in Assam (Dibrugarh). Poor glycaemic control, irregular intake of medication, sedentary lifestyle, dyslipidaemia, obesity and hypertension were common in the patients with T2DM. Researchers concluded that a more comprehensive approach is required to manage T2DM [19]. All these published studies corroborate with the findings of our currently conducted observational study describing the negative impact of smoking status and comorbidities on glycaemic control and the requirement of

a more complex diabetes treatment regimen as the duration of diabetes increases.

Table 6: Presence of Comorbidities and its Effects on Glycaemic Parameters

Comorbidities	Glycaemic parameter	Yes/No	n (N=1164)	Mean (SD)	SE	t-value	P-value
Hypertension	HbA1c (%)	Yes	752	8.68 (2.27)	0.08	2.82	0.005
		No	412	8.28 (2.34)	0.12		
	FBG (mg/dL)	Yes	752	180.54 (71.97)	2.62	2.78	0.005
		No	412	168.04 (75.60)	3.72		
	PPBG (mg/dL)	Yes	752	239.02 (85.86)	3.13	2.75	0.006
		No	412	224.22 (91.73)	4.52		
Dyslipidaemia	HbA1c (%)	Yes	586	8.73 (2.30)	0.09	2.82	0.005
		No	578	8.35 (2.30)	0.10		
	FBG (mg/dL)	Yes	586	188.21 (74.47)	3.08	5.73	<0.0001
		No	578	163.85 (70.45)	2.93		
	PPBG (mg/dL)	Yes	586	239.29 (86.17)	3.56	2.15	0.032
		No	578	228.20 (89.99)	3.74		
Renal Disease	HbA1c (%)	Yes	162	9.58 (2.60)	0.20	5.60	<0.0001
		No	1002	8.37 (2.21)	0.07		
	FBG (mg/dL)	Yes	162	227.37 (94.64)	7.44	7.71	<0.0001
		No	1002	167.82 (65.88)	2.08		
	PPBG (mg/dL)	Yes	162	278.14 (99.57)	7.82	6.24	<0.0001
		No	1002	226.61 (84.14)	2.66		
Diabetic Foot Ulcer	HbA1c (%)	Yes	82	10.08 (2.41)	0.27	6.39	<0.0001
		No	1082	8.42 (2.25)	0.07		
	FBG (mg/dL)	Yes	82	220.92 (78.45)	8.66	5.81	<0.0001
		No	1082	172.72 (72.01)	2.19		
	PPBG (mg/dL)	Yes	82	268.09 (87.52)	9.66	3.67	<0.0001
		No	1082	231.18 (87.77)	2.67		

FBG: Fasting blood glucose; **HbA1c:** Glycosylated haemoglobin; **N:** Total number of patients in the study; **PPBG:** Postprandial blood glucose; **SD:** Standard deviation; **SE:** Standard Error.

Table 7: Duration from Diabetes Onset and Treatment Effects on Glycaemic Parameters.

Glycaemic Parameters	Duration from Diabetes Onset	N (N=1164)	Mean (SD)	Standard Error	P-value
HbA1c (%)	<6 months	169	7.96 (2.46)	0.19	0.0000
	6 months - 5 years	529	8.20 (2.16)	0.09	
	5-10 years	291	8.95 (2.28)	0.13	
	10-20 years	135	9.65 (2.30)	0.20	
	>20 years	40	8.82 (1.90)	0.30	
FBG (mg/dL)	<6 months	169	152.24 (68.41)	5.26	0.0000
	6 months - 5 years	529	163.37 (66.24)	2.88	
	5-10 years	291	197.50 (78.88)	4.62	
	10-20 years	135	267.55 (108.51)	6.37	
	>20 years	40	201.60 (74.02)	11.46	
PPBG (mg/dL)	<6 months	169	213.09 (87.80)	6.75	0.0000
	6 months - 5 years	529	220.14 (80.89)	3.52	
	5-10 years	291	255.23 (92.17)	5.40	
	10-20 years	135	262.02 (92.03)	7.92	
	>20 years	40	250.40 (84.78)	13.40	

FBG: Fasting blood glucose; **HbA1c:** Glycosylated haemoglobin; **N:** Total number of patients in the study; **PPBG:** Postprandial blood glucose; **SD:** Standard deviation.

4. Conclusion

We can conclude that greater the smoking, poorer is the glycaemic control. In addition, comorbidities such as hypertension, renal disease, dyslipidaemia and diabetic foot ulcer are all associated with poor glycaemic control and poor HbA1c control. The duration of diabetes also plays a role in the effectiveness of anti-diabetes therapies; those with recent onset have better glycaemic control than others. Therefore, all these factors should be considered while prescribing the treatment regimen to patients with T2DM.

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Conflict of interest

The authors have no potential conflicts of interests.

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