https://doi.org/10.48047/AFJBS.7.2.2025.176-185

African Journal of Biological Sciences

Journal homepage: http://www.afjbs.com

Research Paper Open Access

Clinical features of Diabetes mellitus; a comparative analysis of type I and II diabetes mellitus patients

Umair Tariq[1], Salman Mansoor[2], Reshmi Roy[3], Bakhtawar Farooq[4]
Hamsa Maryam[5], Mehak Razzaque[6], Hajra Taimur[7]

[1] MBBS, Respiratory Medicine, Calderdale Royal Hospital, Trust Grade SHO
[2] MBBS, MRCP, Registrar, Acute Medicine, Calderdale Royal Hospital
[3] MBBS, Acute Medicine, Calderdale Royal Hospital, Trust Grade SHO
[4] MBBS, Acute Medicine, Calderdale Royal Hospital, Trust Grade SHO
[5] MBBS, Resident Emergency Medicine, Ziauddin Hospital
[6] MBBS Medical Student, Medicine, Hamdard University
[7] MBBS, Medical Officer, Emergency, Patel hospital
Corresponding author: Dr. Hajra Taimur hajrataimur123@gmail.com

Volume 7, Issue 2, Feb 2025

Received: 15 Dec 2024

Accepted: 05 Jan 2025

Published: 10 Feb 2025

doi:10.48047/AFJBS.7.2.2025.176-185

Abstract

Objective: It is important to recognize the broad range of clinical signs and symptoms associated with diabetes, as people with type 1 and type 2 diabetes are frequently misdiagnosed, ill-treated, or mismanaged. Therefore, the purpose of this study was to assess the prevalence of overall clinical presentation in patients with type 1 and type 2 diabetes.

Methodology: This was a multicenter, cross-sectional study that was conducted using a non-probability sampling technique. The duration of the study was about six months, from January 1st, 2022, to June 30th, 2022. A total of 280 type 1 and type 2 diabetes patients, between the ages of 40 and 65 years, were included in the study. The socio-demographic parameters, such as age, gender, and socioeconomic status, health condition, comorbidities, and clinical symptoms associated with both types of diabetes, were documented. A chi square test was applied to evaluate the association between overall symptoms associated with both types. An independent t-test was applied to find out the association between means of demographic parameters.

Results: The study findings showed that the mean ages of type 1 and type 2 diabetics were 52.80±14.75 and 52.96±15.98 years, respectively.

The presence of renal and respiratory manifestations in type 1 and type 2 diabetes patients revealed a significant association in terms of frequent urination, nocturia, dyspnea grading, dyspnea severity, chest tightness, and severity of chest pain ($p<0.05$). Similarly, dermatological manifestations in diabetic patients revealed that the majority of type 2 diabetic patients, 113(80.7%) had dry, cracked skin; compared with type 1 diabetic patients, 71(50.7%), with a significant association observed between them ($p<0.001$).

Conclusion: This study concluded that the majority of the dermatological, renal, respiratory, and neurological manifestations were highly prevalent in type 2 diabetes patients as compared to type 1 diabetes patients. Additionally, an individual's chance of getting type 1 and type 2 diabetes was increased by having comorbidities like dyslipidemia, hypertension, and obesity.

Keywords: Frequent urination, nocturia, dyspnea, type 1 diabetes, type 2 diabetes.

Introduction

Diabetes mellitus (DM) is a long-termendocrine disease that is characterized bypersistently high levels of blood glucose, leading to develop some minor and major complications like weakening of the immune system, periodontal disorders, retinopathy, nephropathy, retinopathy, neuropathy, and cardiovascular diseases [1].

In Pakistan, the incidence of diabetes was 11.77% in 2016 [2] and 16.98% in 2018 [3]. This number is enormously high and continues to rise up after every year. There is additional evidence indicating that most of the people remain undetected, which would significantly increase the prevalence of mistreated illnesses as well as the risk of consequences. The main causes of diabetes in people, especially in adults, are genetics and modifications in lifestyle. These include leading a lifestyle of inactivity, consuming more packaged foods with sugar additives, and obesity. Measurements based on the WHO Asia-Pacific cutoffs show that Pakistan had a central obesity rate of 73.1% (37.3% accounts for malesand 62.7% accounts forfemales), and an overall prevalence of general overweight and obesity of 57.9% (42% for malesand 58% for females[4].

DM can be broadly divided into three types based on their etiological factors and clinicalconsequences:

1. Type 1 diabetes mellitus
2. Type 2 diabete mellitus
3. Gestational diabetes (GDM).

There are a few other, infrequent forms of diabetes, including monogenic and secondary [5].

T1DM is defined by a depletion ofbeta cells of pancreas that produces insulin, which causes an insulin insufficiency. T1DM usually occurs in youngsters and adolescents, and it is partially inherited due to a number of genes, including specific HLA genotypes known to affect diabetes risk [6]. One or more environmental factors may cause diabetes to develop in a genetically predisposed person such as people's eating habits. Repeated urination, excessive thirst, increased appetite, loss of weight, mouth dryness, GIT disturbances, and nausea, tiredness, blurred vision, heavy strenuous breathing, frequent skin infections, urinary tract, or vaginal infection, irritability or mood swings, bedwetting in a kid who has been dry at night are the clinical manifestations of T1DM [7].

The most prevalent form of diabetes is T2DM. Insulin resistance and possibly a slightly decreased insulin secretion are two characteristics of T2DM. The indications of type 2 diabetes include extreme dehydration, increased urination, blurry vision, irritability, exhaustion, burning or numbness in the feet and hands, delayed wound healing, yeast infections, increased hunger, weight loss, and an increase in infections. Genetics and lifestyle habits are the primary reasons linked withtype 2 diabetes [8].

Obesity, lacking of physical exercise, a poor diet, anxiety, and urbanization are some lifestyle factors linked with the occurenceof type 2 diabetes. Dietary elements like drinks with added sugar are linked to a higher chance to develop type 2 diabetes [9].

The treatment of DM depends on accurate diagnosis. People with hyperglycemia frequently have DM identified. Blood glucose readings were necessary as part of the diabetes mellitus diagnosis requirements. Diabetes is characterized by certain clinicalsigns. According to American Diabetes Association (ADA), if the blood sugar level is <126mg/dl and the after 2 hours of glucose tolerance test,the level of glucose in plasma is <200mg/dl,diabetes is diagnosed[10]. The non-enzymatic glycation of hemoglobin is measured by the commonly used chronic glycaemia marker hemoglobin A1c (HbA1c), which also represents the mean blood glucose levels over a two to three months' time period. With an upper limit of 6.5% (corresponding to a calculated typical glucose of 140 mg/dl), it can be utilized for diagnosing diabetes [10].

The longer the time between hyperglycemia and DM detection, the higher the risk of microvascular and macrovascular complications after DM diagnosis. Due to this, it is critical that DM in patients with hyperglycemia is identified and treated as soon as possible [11]. Functional capabilities and quality of life are negatively impacted by diabetes, which raises mortality rates and causes premature death. Concerns have lately been raised because more than one-third of adult deaths from diabetes occur before the age of 60 [12]. Rising levels of poor diet consumption and inactivity have been linked to these rises in body mass index (BMI) and fasting plasma glucose. Particularly among those with greater BMIs, type 2 diabetes is more frequent. The aging of the populace is another factor because diabetes typically strikes older people [13].

There is less evident data available based on prevalence of clinical manifestationof DMDM. Additionally, in order to timely diagnose diabetes mellitus (DM), it is imperative to comprehend the initial clinical manifestations of the disease in the general population. This significance of this study was to find out and compare the clinical features of the type 1 diabetes mellitus and type 2 diabetes mellitus.

Methodology

This study I a cross sectional survey in which non probability sampling technique I used. The Ethical Review Board of the hospital has given the permission from theconcerned hospital. This study took 6 months to be completed from January 1st, 2022, to June 30th, 2022.

A sample size of 280 diabetic patients(including type 1 and type 2 diabetes) were includedin this study of age group 40 to 65 years. This study excluded those individuals with extreme weight loss,individuals in which there were lower fasting sugar level,low glucose tolerance,individuals who have gone

through any surgical procedures,and those who had chemotherapy.

The latest HbA1c, an evaluation of glycemic control, was utilized to identify patients with T1DM and T2DM. Age, gender, economic status, state of health, co-morbidities, and symptoms of diabetes were recorded. Additionally, BMI was measured by the measurements of height and weight. The presence of stress, anxiety, and depressive symptoms was also assessed. Researchers took assessments of pulse rate, breathing rate, and blood pressure. The average of the three readings' pulse rates was determined along with the maximum blood pressure following three measurements. A questionnaire was used to collect information on previous sleep disturbances (insomnia, strange movements while sleeping, and difficulty falling asleep at the desired time). A past history of eye pain, including discomfort, a grainy feeling, itchiness, and inflammatory conditions, along with blurred vision that got better with blinking and lots of tears, considered as dry eyes. Some other investigations were also done to check the levels of random blood sugar,total cholesterol,triglycerides,Low density lipoproteins(LDL C),high density lipoproteins(HDL C)

Data was entered and analyzed using SSPS version 20.0,the sociodemographic variables and the variable of signs and symptoms related totype 1 and 2 diabetes were reported infrequencies and percentages. The quantitative variables were expressed as mean and standard deviations. Achi-square was used to assess the association of clinical symptoms between type 1 and 2 Diabetes Mellitus . Furthermore, an independent t-test was applied to find out the association between the means of the demographic variables. A p value of less than 0.05 was considered as statistically significant.

Results

Out of 280 participants,140 were type 1 diabetic patients.,81(57.9%) males were included and 59(42.1%) females were included, and another 140 were type 2 diabetic patients,59(42.1%) were males and 81(57.9%) were females with type 2 DM, with a difference significantly observed between both types of diabetes, (p=0.009). The mean ages of type 1 diabetic patients were 52.80±14.75 and of type 2 the mean ages were 52.96±15.98 years, with no significant difference between them (p=0.929). The mean weights of type 1 and type 2 diabetics were 66.62±13.7981 and 64.64±14.41 kg, respectively, with no significant differenceinsignificant between them (p=0.242). The mean heights of type 1 and type 2 diabetics were70.73±9.17 and 65.01±9.63 inches, respectively, showing the significant association between the two(p <0.001). The mean BMI of type 1 and type 2 diabetics were found to be 21.35±6.20 and 25.33±9.94 kg/m2, respectively, showing the significant association between the two types of diabetes(p <0.001). The mean respiratory rates of type 1 and type 2 diabetics were reporte to be 18.29±5.91 and 17.82±5.33 breaths/min , with an no significant association between the two (p =0.485). The mean temperatures of type 1 and type 2 diabetics were 73.47±25.14 and 66.86±26.18 oF respectively, with an association insignificantobserved between them (p=0.032). The mean systolic blood pressure of type 1 and type 2 diabetics were162.14±44.69 and 167.46±41.01mm Hg, respectively, with ano significant relationship between them (p=0.300), and the mean hypertension duration was reported to be 4.45±3.95 and 4.07±3.95 years, with no statistically significant difference between them (p= 0.433). The mean heart rates of type 1 and type 2 diabetics were reported to be 85.47±11.75 and 82.47±11.06 beats/min, with a significant differencefound between them (p=0.028). The mean of using cigarettes per day for type 1 and type 2 diabetics was reported to be 4.35±6.01and 1.57±4.15. The mean RBS of type 1 and type 2 diabetics were 229.71±73.02 and 294.87±123.29, with an association statically significant observed between them (p<0.001), as presented in Table I.

The majority of type 1 diabetes patients 66(47.1%) and type 2 diabetes patients 70(50.0%) belonged to the middle-class, with a difference statistically significant found among them (p<0.001). Most of the type 1 diabetic patients 99(70.7%) and type 2

diabetic patients 92(65.7%) were hypertensive; though, an association insignificantwas observed between them (p =0.369). The dyslipidemia reported was significantly associated between type 1 and type 2 diabetic patients (p=0.039),there was sginificant association reported in terms of smoking (p< 0.001) and (p=0.039), and physical activity (p < 0.001), as observed in Table II.

The presence of renal manifestations in type 1 diabetes and type 2 diabetes reported that only 11(7.9%) type 1 diabetic patients and 33(23.6%) type 2 diabetic patients urinates repeatedly, , with a statistical association significant between the two types of diabetes (p<0.001). Most of the type 1 diabetes 130(92.9%) and type 2 diabetes 105(75.0%) urinate three times at night, with a statistically significant relationship found between them (p<0.001). Additionally, thestatistically significant association observed in control of blood pressure between the two types of diabetes (p<0.001), as shown in Table III.

The incidence of ocular features in type 1 and type 2 diabetes patients revealed that flashes were observed only in type 2 diabetes patients38(27.1%), with a statistical association significant found between both types (p <0.001). Furthermore, blind spots were detected in 30(21.4%) type 1 and 50(35.7%) type 2 diabetes patients, with a seen between both types, (p= 0.008). Furthermore, distorted vision was observed in 5(3.6%) type 1 and 30(21.4%) type 2 diabetics, with a significant associationfound between both types (p <0.001). Additionally, in terms of night blindness,a significant association was observed between the two types of diabetes mellitus (p <0.001), eye floaters (p <0.001), difficulty in reading or seeing the distant objects(p<0.001), and visual disturbances (p =0.014). Respiratory manifestations while climbing the stairs reported in type 1 and type 2 diabetes patients were 48(34.3%) type1 and58(41.4%) type 2 diabetes patients showed dyspnea when climbing stairs, with significantly different p valuebetween them (p < 0.001). Moreover, a significant association was observed between both types with respect to dyspnea severity (p < 0.001), chest tightness (p < 0.001), and severity of chest pain (p <0.001), as presented in Table IV.

In type 1 and type 2 diabetic patients the incidence of oral manifestations showed a significant relationship between both types in terms of dry mouth (p =0.009), red, inflamed, and painful gums (p <0.001), burning feeling (p=0.009), and sweet-smelling breath (p=0.010). Likewise, dermatological clinical features in diabetic patients showed that most of the type 2 diabetic patients 113(80.7%) had dry, cracked skin; compared to the type 1 diabetic patients 71(50.7%), with a relationship significant noticed between them (p<0.001). Furthermore, an association significant was observed between both types with regard to scaly patches of light brown color (p<0.001), the blotches of yellowish orred or brown color on skin (p<0.001), rigid, thick skin (p<0.001), and velvet-like dark skin blisters (p=0.006), as mentioned in Table V.

The incidence of gastrointestinal and psychological manifestations in type 1 and type 2 diabetes patients showed a statistically significant relationship in terms ofincreased thirst (p <0.001), increased hunger (p <0.001), unexplained weight loss (p = 0.046), delayed wound healing (p<0.001), loss of appetite duration(p = 0.013), increased incidences and infection severity(p<0.001), cold sweats (p<0.001), changes in mood(p <0.001), edema of eyes,hands,ankles and feets(p=0.013), confused or poor concentration(p=0.024), too sensitive to touch feet (p <0.001), pain in muscles or legs or feet spasm (p <0.001), and insomnia (p<0.001), as mentioned in Table VI.

Table I: Demographic details of type 1 and 2 diabetes patients. (n=280).

Variable	Type 1 diabetes mellitus Mean ± SD	Type 2 diabetes mellitus Mean ± SD	p-value
Age (years)	52.80±14.75	52.96±15.98	0.929

Weight (kg)	66.62±13.7981	64.64±14.41	0.242
Height (Inch)	70.73±9.17	65.01±9.63	<0.001
BMI (kg/m^2)	21.35±6.20	25.33±9.94	<0.001
Respiratory Rate (breath/min)	18.29±5.91	17.82±5.33	0.485
Temperature (ºF)	73.47±25.14	66.86±26.18	0.032
Systolic Blood pressure (mmHg)	162.14±44.69	167.46±41.01	0.300
If yes Duration (Years)	4.45±3.95	4.07±3.95	0.433
Heart rate (beats/min)	85.47±11.75	82.47±11.06	0.028
Smoking (number of cigarettes per day)	4.35±6.01	1.57±4.15	---
Random blood sugar (RBS)	229.71±73.02	294.87±123.29	<0.001

Table II: The prevalence of gender, comorbidities, and socioeconomic status.

Variable		Type 1 diabetes mellitus n(%)	Type 2 diabetes mellitus n(%)	p-value
Gender	**Male**	81(57.9%)	59(42.1%)	0.009
	Female	59(42.1%)	81(57.9%)	
Socioeconomic Status	**Low**	17(12.1%)	39(27.9%)	<0.001
	Middle	66(47.1%)	70(50.0%)	
	High	57(40.7%)	31(22.1%)	
History of Hypertension	**Yes**	99(70.7%)	92(65.7%)	0.369
	No	41(29.3%)	48(34.3%)	
History of Dyslipidemia	**Yes**	112(80.0 %)	97(69.3%)	0.039
	No	28(20.0%)	43(30.7%)	
History of Depression	**Yes**	35(25.0%)	42(30.0%)	0.349
	No	105(75.0 %)	98(70.0%)	
History of Smoking	**Yes**	75(53.6%)	30(21.4%)	<0.001
	No	65(46.4%)	110(78.6%)	
Physical Activity	**Yes**	36(25.7%)	83(59.3%)	<0.001
	No	104(74.3 %)	57(40.7%)	

Table III: The distribution of renal manifestations in type 1 and 2 diabetes patients.

Variables	Type 1 diabetes mellitus n (%)	Type 2 diabetes mellitus n (%)	p -value
Frequent urination	**Yes**	11(7.9%)	33(23.6%)	<0.001
	No	129(92.1%)	107(76.4%)	
Urination at night	**3 times at night**	130(92.9%)	105(75.0%)	<0.001
	at every two hour	10(7.1%)	33(23.6%)	
	at every hour	0(0.0%)	2(1.4%)	
Color of urine	**Light-colored urine**	119(85.0%)	113(80.7%)	0.120
	Dark yellow urine	21(15.0%)	23(16.4%)	
	Very dark or bloody urine	0(0.0%)	4(2.9%)	
BP control becomes worst	**Yes**	21(15.0%)	93(66.4%)	<0.001
	No	119(85.0%)	47(33.6%)	

Table IV: The distribution of ocular and respiratory manifestations in type 1 and 2 diabetes patients.

Variables		Type 1 diabetes mellitus n(%)	Type 2 diabetes mellitus n(%)	P-value
Flashes	**Yes**	0(0.0%)	38(27.1%)	<0.001
	No	140(100.0%)	102(72.9%)	
Blind spots	**Yes**	30(21.4%)	50(35.7%)	0.008
	No	110(78.6%)	90(64.3%)	
Distortion	**Yes**	5(3.6%)	30(21.4%)	<0.001
	No	135(96.4%)	110(78.6%)	
Poor night vision/night blindness	**Yes**	5(3.6%)	54(38.6%)	<0.001
	No	135(96.4%)	86(61.4%)	
Small dark spots eye floaters or streaks in vision	**Yes**	10(7.1%)	45(32.1%)	<0.001
	No	130(92.9%)	95(67.9%)	
Trouble in reading or seeing faraway objects	**Yes**	78(55.7%)	39(27.9%)	<0.001
	No	62(44.3%)	101(72.1%)	

Visual Disturbances	**Yes**	45(32.1%)	65(46.4%)	0.014
	No	95(67.9%)	75(53.6%)	
Blurry vision	**Yes**	46(32.9%)	60(42.9%)	0.085
	No	94(67.1%)	80(57.1%)	
Vision loss	**Yes**	45(32.1%)	53(37.9%)	0.316
	No	95(67.9%)	87(62.1%)	
Shortness of breath	**Yes**	57(40.7%)	56(40.0%)	0.903
	No	83(59.3%)	84(60.0%)	
Dyspnea grading	**While climbing stairs**	48(34.3%)	58(41.4%)	<0.001
	While walking for more than 6 hours in a day	30(21.4%)	65(46.4%)	
	While walking for less than 6 hours in a day"	37(26.4%)	12(8.6%)	
	While at rest	25(17.9%)	5(3.6%)	
Dyspnea severity, If Yes	**Mild**	36(25.7%)	63(45.0%)	<0.001
	Moderate	94(67.1%)	56(40.0%)	
	Severe	10(7.1%)	21(15.0%)	
chest tightness	**Yes**	31(22.1%)	83(59.3%)	<0.001
	No	109(77.9%)	57(40.7%)	
Severity of chest pain	**Improves with rest**	92(65.7%)	97(69.3%)	<0.001
	Need pain relieving medication"	48(34.3%)	22(15.7%)	
	Requires hospital visit	0(0.0%)	21(15.0%)	

Table V: The distribution of oral and dermatological manifestations in type 1 and 2 diabetes patients.

Variables		Type 1 diabetes mellitus n(%)	Type 2 diabetes mellitus n(%)	p -value
Red, painful and inflamed gums	**Yes**	20(14.3%)	56(40.0%)	<0.001
	No	120(85.7%)	84(60.0%)	
Dry mouth	**Yes**	26(18.6%)	45(32.1%)	0.009
	No	114(81.4%)	95(67.9%)	
Burning sensation in the mouth	**Yes**	51(36.4%)	31(22.1%)	0.009
	No	89(63.6%)	109(77.9%)	
Sweet Smell breath	**Yes**	42(30.0%)	63(45.0%)	0.010
	No	98(70.0%)	77(55.0%)	
Dry cracked skin	**Yes**	71(50.7%)	113(80.7%)	<0.001
	No	69(49.3%)	27(19.3%)	
Light brown scaly patches	**Yes**	16(11.4%)	58(41.4%)	<0.001
	No	124(88.6%)	82(58.6%)	
Yellow reddish or brown areas on skin	**Yes**	11(7.9%)	55(39.3%)	<0.001
	No	129(92.1%)	85(60.7%)	
Darker areas of skin that feel like velvet	**Yes**	67(47.9%)	90(64.3%)	0.006
	No	73(52.1%)	50(35.7%)	
Hard thickened skin	**Yes**	0(0.0%)	25(17.9%)	<0.001
	No	140(100.0%)	115(82.1%)	
Blisters	**Yes**	35(25.0%)	38(27.1%)	0.683
	No	105(75.0%)	102(72.9%)	

Table VI: The distribution of gastrointestinal and psychological manifestations in type 1 and 2 diabetes patients.

Variables		Type 1 diabetes mellitus n(%)	Type 2 diabetes mellitus n(%)	p -value
Increased thirst	**Yes**	43(30.7%)	88(62.9%)	<0.001
	No	97(69.3%)	52(37.1%)	
Fatigue	**Yes**	114(81.4%)	113(80.7%)	0.879
	No	26(18.6%)	27(19.3%)	
Increased hunger	**Yes**	20(14.3%)	57(40.7%)	<0.001
	No	120(85.7%)	83(59.3%)	
Unexplained weight loss	**Yes**	82(58.6%)	98(70.0%)	0.046
	No	58(41.4%)	42(30.0%)	
Slow/delayed wound healing	**Yes**	77(55.0%)	113(80.7%)	<0.001
	No	63(45.0%)	27(19.3%)	

loss of appetite	**Yes**	78(55.7%)	74(52.9%)	0.631
	No	62(44.3%)	66(47.1%)	
If yes, time period of appetite loss	**Suddenly**	41(29.3%)	61(43.6%)	0.013
	More than one week	99(70.7%)	79(56.4%)	
Increased incidence and severity of infections	**Yes**	30(21.4%)	74(52.9%)	<0.001
	No	110(78.6%)	66(47.1%)	
cold sweating	**Yes**	35(25.0%)	109(77.9%)	<0.001
	No	105(75.0%)	31(22.1%)	
feeling fatigued and weak sometimes	**Yes**	109(77.9%)	103(73.6%)	0.403
	No	31(22.1%)	37(26.4%)	
Burning or numbness in the feet or hand	**Yes**	82(58.6%)	91(65.0%)	0.268
	No	58(41.4%)	49(35.0%)	
irritability or mood swings	**Yes**	72(51.4%)	104(74.3%)	<0.001
	No	68(48.6%)	36(25.7%)	
Edema of feet, ankles, hands or eyes	**Yes**	78(55.7%)	98(70.0%)	0.013
	No	62(44.3%)	42(30.0%)	
Difficulty in concentration or confusion	**Yes**	25(17.9%)	41(29.3%)	0.024
	No	115(82.1%)	99(70.7%)	
burning pain in legs or feet	**Yes**	80(57.1%)	89(63.6%)	0.272
	No	60(42.9%)	51(36.4%)	
too sensitive feet on touch	**Yes**	20(14.3%)	46(32.9%)	<0.001
	No	120(85.7%)	94(67.1%)	
muscular pain or discomfort in legs or feet	**Yes**	103(73.6%)	132(94.3%)	<0.001
	No	37(26.4%)	8(5.7%)	
symptoms worsening at night	**Yes**	63(45.0%)	72(51.4%)	0.282
	No	77(55.0%)	68(48.6%)	
Insomnia	**Yes**	36(25.7%)	69(49.3%)	<0.001
	No	104(74.3%)	71(50.7%)	

Discussion

Globally, diabetes is on the rise. Due to lifestyle changes and a rise in obesity, DM prevalence has increased worldwide [14]. Therefore, this study is based on the clinical oucomes observed intype 1 and type 2 diabetic patients at multi-center system.

One of the studies observed that the diabetic individuals' mean age at presentation was 50±11 years. Generally, patient with diabetes has had the disease for 8.5 years, and the majority of diabetic patients (37%) have had it for 10 years or longer [15]. Another study ofAhmed et al. reported that the average age of occurrence of diabetes reported to be 54 years old [16]. The current study was not evidently supporting the the study mentioned aboveand it has been shown that the mean age of the type 1 diabetics was 52.80±14.75 years and that of the type 2 diabetics was 52.96±15.98 years.

The overall incidence of hypertension among type 2 diabetics was reported to be 39.84% [17].This was in contrast to earlier research done in Pakistan (40.45%) [18], Bahrain (38%) [19], and Taiwan (39%) [20]. However, these results indicated a high occurrence of hypertension among type 2 diabetes patients as compared to those researches done in Turkey (29%) [21], and India (25.6%)[22]. Discrepancies in the results could be explained by differences in the socio-demographics, research design, and type of study group, sample size variation, and awareness. The present study was not in agreement with the above reported research and revealed a 99(70.7%) type 1 diabetes patients and 92(65.7%) type 2 diabetes patients had histories of hypertension which was too high in contrast to the above reported studies.

Similarly, a case series conducted in Uganda, assessed 103 newly diagnosed diabetes patients sequentially and observed that approximately all diabetes patients had two clinical manifestations: increased urination (100%) and excessive thirst (79%). The moderately common symptoms (25–50% of patients) included blurred vision, overeating, and frequent perspiration [23]. This is consistent with studies showing that diabetes signs appear later in low-income countries [24]. The present study showed dissimilarity with the previous study and found that 33(23.6%) type 2 diabetes patients reported frequent urination. Moreover, 190 (38.0%) people reported feeling more thirsty. While 60(42.9%) type 2 diabetes patients reported blurred vision, 57(40.7%), and 109(77.9%) reported increased appetite and cold sweating, respectively. On the other hand, these symptoms were reported with a lower frequency in type 1 diabetics than the type 2 diabetics.

One of the most typical dermatological manifestations in diabetic patients is xerosis, which has been estimated to be present in up to 40% of diabetes patients [25]. Xerosis is the medical term for abnormally dry epidermis. Skin that is affected may have scaling, cracks, or a rough appearance. Patients with diabetes typically have these skin changes on their ankles. Obese diabetic individuals have reportedly been shown to have more severe foot hypohidrosis [26]. Xerosis frequently happens in condition of microvascular complications in diabetic patients [27]. The present study was not in agreement with the above studies, 113(80.7%) type 2 diabetic patients reported dry, cracked skin, while 71(50.7%) type 1 diabetics reported dry skin. However, there was a statistically significant association observed between them ($p<0.001$).

Likewise, another Chinese research was intended to assess the occurrence of Cardiovascular Autonomic Neuropathy (CAN) among diabetes patients. Thus, 2,048 participants were randomly selected, with 73 participants diagnosed with T1DM and 1975 participants diagnosed with T2DM. Lethargy (28.6%), vertigo (23.4%), repetitive urination (19.6%), perspiration (18.3%), and urination at night (15.9%) were the most prevalent CAN symptoms [28]. The present study was not in agreement with the above-mentioned study and revealed that 140 patients had type 1 diabetes, while 140 patients had type 2 diabetes. The most common manifestations were muscular pain 132(94.3%), dry, cracked skin 113(80.7%), delayed wound healing 113(80.7%), cold sweating 109(77.9%) in type 2 diabetes patients. Additionally, the frequent clinical features in type 1 diabetes patients were urination at night 130(92.9%), fatigue 114(81.4%), feeling tired 109(77.9%), and muscular pain 103(73.6%).

Conclusion

This study concluded that the majority of the dermatological, renal, respiratory, and neurological manifestations were highly prevalent in patients with type 2 diabetes as compared to type 1 diabetes. Additionally, an individual's chance of getting type 1 and type 2 diabetes was increased by having comorbidities like dyslipidemia, hypertension, and obesity. Patient education and lifestyle modifications are essential to improve the health and standards of life of people with diabetes mellitus.

References

1. Roden M. Diabetes mellitus - Definition, Klassifikation und Diagnose [Diabetes mellitus: definition, classification and diagnosis]. Wien Klin Wochenschr. 2016 Apr;128 Suppl 2:S37-40. German. doi: 10.1007/s00508-015-0931-3.
2. Meo SA, Zia I, Bukhari IA, Arain SA. Type 2 diabetes mellitus in Pakistan: current prevalence and future forecast. J. Pakistan Med. Assoc. 2016 Dec;66(12):1637–1642.
3. Aamir AH, Ul-Haq Z, Mahar SA, Qureshi FM, Ahmad I, Jawa A, et al. Diabetes Prevalence Survey of Pakistan (DPS-PAK): prevalence of type 2 diabetes mellitus and prediabetes using HbA1c: a population-based survey from Pakistan. BMJ Open. 2019 Feb;9(2): e025300. doi:10.1136/ bmjopen-2018-025300.
4. Basit A, Askari S, Zafar J, Riaz M, Fawwad A. NDSP 06: prevalence and risk factors for obesity in urban and rural areas of Pakistan: a study from second National Diabetes Survey of Pakistan (NDSP), 2016-2017. Obes. Res. Clin. Pract. 2021;15(1):19–25.
5. Solis-Herrera C, Triplitt C, Reasner C, DeFronzo RA, Cersosimo E. Classification of Diabetes Mellitus. [Updated 2018 Feb 24]. In: Feingold KR, Anawalt B, Blackman MR, et al, editors. Endotext [Internet]. South Dartmouth (MA): MDText.com, Inc.; 2000-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK279119/
6. DiMeglio LA, Evans-Molina C, Oram RA. Type 1 diabetes. Lancet. 2018 Jun 16;391(10138):2449-2462. doi: 10.1016/S0140-6736(18)31320-5.

7. Zajec A, Trebušak Podkrajšek K, Tesovnik T, Šket R, Čugalj Kern B, Jenko Bizjan B, et al. Pathogenesis of Type 1 Diabetes: Established Facts and New Insights. Genes. 2022; 13(4):706. https://doi.org/10.3390/genes13040706.
8. Zheng Y, Ley SH, Hu FB. Global aetiology and epidemiology of type 2 diabetes mellitus and its complications. Nat Rev Endocrinol. 2018 Feb;14(2):88-98.
9. Sami W, Ansari T, Butt NS, Hamid MRA. Effect of diet on type 2 diabetes mellitus: A review. Int J Health Sci (Qassim). 2017 Apr-Jun;11(2):65-71.
10. American Diabetes Association. Classification and diagnosis of diabetes. Standard of Medical Care in Diabetes. Diabetes Care. 2016;39(suppl 1):S13–22.
11. Chawla A, Chawla R, Jaggi S. Microvasular and macrovascular complications in diabetes mellitus: Distinct or continuum? Indian J Endocrinol Metab. 2016 Jul-Aug;20(4):546-51. doi: 10.4103/2230-8210.183480.
12. Khan MAB, Hashim MJ, King JK, Govender RD, Mustafa H, Al Kaabi J. Epidemiology of Type 2 Diabetes - Global Burden of Disease and Forecasted Trends. J Epidemiol Glob Health. 2020 Mar;10(1):107-111. doi: 10.2991/jegh.k.191028.001.
13. Gupta S, Bansal S. Does a rise in BMI cause an increased risk of diabetes?: Evidence from India. PLoS One. 2020 Apr 1;15(4):e0229716. doi: 10.1371/journal.pone.0229716.
14. Carrillo-Larco RM, Barengo NC, Albitres-Flores L, Bernabe-Ortiz A. The risk of mortality among people with type 2 diabetes in Latin America: A systematic review and meta-analysis of population-based cohort studies. Diabetes Metab Res Rev. 2019 May;35(4):e3139.
15. Niaz F, Bashir F, Shams N, Shaikh Z, Ahmed I. Cutaneous manifestations of diabetes mellitus type 2: prevalence and association with glycemic control. Journal of Pakistan Association of Dermatologists. 2016;26 (1):4-11.
16. Ahmed K, Muhammad Z, Qayum I. Prevalence of cutaneous manifestations of diabetes mellitus. J Ayub Med Coll Abbottabad. 2009 Apr-Jun;21(2):76-9.
17. Rupasinghe CD, Shahbaz U, Huang E, Patel A, Mohammed Saeed Muthanna F, Basta M, et al. Determinants of Hypertension Among Patients With Type 2 Diabetes Mellitus in Karachi, Pakistan: A Cross-Sectional Study. Cureus. 2022 Feb 12;14(2):e22157. doi: 10.7759/cureus.22157.
18. Arshad AR. Control of blood pressure in hypertensive patients with diabetes mellitus type 2. Pak Heart J. 2014;47(2):78-83. Doi:10.13140/2.1.2283.5845
19. Al-Mahroos F, Al-Roomi K, McKeigue PM. Relation of high blood pressure to glucose intolerance, plasma lipids and educational status in an Arabian Gulf population. Int J Epidemiol. 2000 Feb;29(1):71-6. doi: 10.1093/ije/29.1.71.
20. Tseng CH. Higher risk of hypertension in indigenous type 2 diabetic patients in Taiwan. J Hypertens. 2006 Sep;24(9):1817-21. doi: 10.1097/01.hjh.0000242406.76085.c4.
21. Satman I, Yilmaz T, Sengül A, Salman S, Salman F, Uygur S, et al. Population-based study of diabetes and risk characteristics in Turkey: results of the Turkish Diabetes Epidemiology Study (TURDEP). Diabetes Care. 2002; 25(9):1551-6. doi: 10.2337/diacare.25.9.1551.
22. Venugopal K, Mohammed MZ: Prevalence of hypertension in type-2 diabetes mellitus. J Heal Res.

2014;1(4):223-7. DOI: 10.4103/2348-3334.142981

23. Mayega RW, Rutebemberwa E. Clinical presentation of newly diagnosed diabetes patients in a rural district hospital in Eastern Uganda. Afr Health Sci. 2018 Sep;18(3):707-719. doi: 10.4314/ahs.v18i3.29.
24. Ambady R, Chamukuttan S. Early diagnosis and prevention of diabetes in developing countries. Rev Endocr Metab Disord. 2008;9(3):193–201.
25. Goyal A, Raina S, Kaushal SS, Mahajan V, Sharma NL. Pattern of cutaneous manifestations in diabetes mellitus. Indian journal of dermatology. 2010;55(1):39.
26. Iacopi E, Riitano N, Dini V, Berta R, Pieruzzi L, Janowska A, et al. Using Skin Bioengineering to Highlight How Weight and Diabetes Mellitus Modify the Skin in the Lower Limbs of Super-Obese Patients. Diabetes Metab Syndr Obes. 2020 Mar 16;13:729-738. doi: 10.2147/DMSO.S229042.
27. Sawatkar G, Kanwar A, Dogra S, Bhadada S, Dayal D. Spectrum of cutaneous manifestations of type 1 diabetes mellitus in 500 south Asian patients. British Journal of Dermatology. 2014;171(6):1402–06.
28. Pan Q, Li Q, Deng W, Zhao D, Qi L, Huang W, et al. Prevalence and Diagnosis of Diabetic Cardiovascular Autonomic Neuropathy in Beijing, China: A Retrospective Multicenter Clinical Study. Front Neurosci. 2019 Oct 25;13:1144. doi: 10.3389/fnins.2019.01144.

.