

Skin Manifestations of Diabetes Mellitus

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Abstract

Background: To analyze skin manifestations in patients with diabetes mellitus

Methods: This cross sectional study was conducted on 100 consecutive patients of Diabetes Mellitus type 1 &2, either attending the out-patients departments of Dermatology and Medicine or admitted in medical wards of Cantonment General Hospital, Rawalpindi from 1st January 2017 to 30th June 2017. Both male and female patients aged between 15-80 years were included in the study.

Results: Out of hundred patients, skin changes were present in 64%. The common disorders were skin infections in 43 patients, pruritis in 17, and skin tags in 15 patients. Other manifestations were lichen planus in 5, diabetic foot in 5, acanthosis nigricans in 4, eruptive xanthomas in 3, eczema in 3, vitiligo in 2, diabetic dermopathy in 1, xerosis in 1 and psoriasis in 1 patient.

Conclusion: Skin involvement is quite common in diabetes. It can manifest as first sign or may manifest at any time during the course of disease so it is important to identify and appropriately treat these patients.

Key Words: Diabetes Mellitus, Skin manifestations, Skin disorders.

Introduction

Skin disorders are mostly neglected and frequently under-diagnosed in diabetic patients. Diabetes mellitus (DM) is a syndrome characterized by a high serum glucose level and disturbed carbohydrate and lipid metabolism due to relative insulin deficiency, insulin resistance or both.¹ This increase in the incidence of DM is due to population growth, aging, urbanization, and increasing prevalence of obesity and physical inactivity.² Type-2 diabetes mellitus (T2DM) is expanding at an epidemic rate and it is most common endocrine problem with serious health concerns.³⁻⁶

Diabetes can affect every organ of the body including the skin.^{7,8} Skin manifestations can develop in almost 30% of all diabetics.⁸ Dermatological problems can appear during the course of disease in already known diabetic patients or it may be the first presenting sign

in newly diagnosed patients. It can even precede the diagnosis by many years thus, giving a clue to clinicians.⁸ Both type-1 diabetes mellitus (T1DM) & T2DM patients can develop cutaneous disorders. Autoimmune disorders like acanthosis nigricans (AN), necrobiosis lipoidica (NL), diabetic dermopathy, scleredema, and granuloma annulare, or infectious in the form of erythrasma, necrotizing fasciitis, and mucormycosis are more common in T1DM while cutaneous infections are more common in T2DM.^{8,9} Female patients generally had increased frequency of acanthosis nigricans. Skin tags are also more commonly found in diabetics, probably due to hyperinsulinemia and higher glycated haemoglobin (HbA1c) levels.³ Diabetic dermopathy is considered as pathognomonic of diabetes.¹⁰ Pruritus can be an initial symptom of DM.¹¹

Eruptive xanthomas (EX) are the lesions, observed in patients with poor control of diabetes and hypertriglyceridemia, most commonly found over the buttocks, elbows and knees. NL is a dermatosis of unknown origin, characteristically occurring in patients with diabetes. Vitiligo is a chronic disease of autoimmune etiology that is characterized by an absence/malfunctioning of melanocytes resulting in hypo or achromic spots surrounded by normal skin seen in T1DM.¹³ Apart from these commonly described diabetic markers, a correlation has been found between psoriasis and T2DM.³ Although skin manifestations occur commonly in diabetes, there is marked variability in outcomes among different study populations due to difference in climate and hygienic conditions across the country which can affect the results.

Patients and Methods

This study was conducted at the out-patients departments of Dermatology and Medicine and on those patients admitted in medical wards of Cantonment General Hospital, Rawalpindi from January to June 2017. 100 consecutive patients of T1DM and T2DM already diagnosed according to the WHO diagnostic criteria were included in the study. Patients aged between 15-80 years were included.

Patients younger than 15 years or those suffering from vasculitis, hypercholesteremia, malignancies, gestational diabetes, and thyroid-related disorders or taking any drug affecting the skin were excluded. After taking informed consent, complete history and detailed examination was done. Data was collected on a proforma. Continuous variables like age were expressed as Mean \pm S.D and categorical variables like gender, types of skin lesions and skin infections etc. were presented in the form of frequencies and percentages.

Results

There were 32% males (M: F=1:2.1). The youngest patient was 28 years and the oldest was 80 years with a mean age of 57.44 ± 10.37 years. The duration of diabetes was < 10 years in 56 patients. 26 patients had 11-20 years of diabetes, and 10 had > 20 years of diabetes. 8 patients were newly diagnosed as diabetics. 6 patients have type 1 and 94 patients have type 2 diabetes mellitus (Table 1). Skin manifestations were found in 64 (64%) of patients. Out of these, 3 T1DM had skin manifestations and 61 patients of T2DM had skin lesions. Majority of patients (35%) had one type of lesion, two types of lesion were found in 23%, while 6% had three lesions (Table 1). The most frequent finding was skin infections found in 43 patients. Majority of patients had fungal infections i.e. 26 patients (Fig.1) while 9 patients had furuncles and carbuncles, 6 patients presented with cellulitis and only 2 had folliculitis. Second most common finding was pruritis in 17 patients. Skin tags were present in 15 and lichen planus was present in 5 patients. Diabetic foot was present in 5 patients along with numbness & paresthesias but none of them had amputation. Acanthosis nigricans was found in 4 patients (Fig.2). Eczema and eruptive xanthomas over upper eyelids were found in three patients each. Vitiligo was seen in two patients while diabetic dermopathy, xerosis and psoriasis were present in only one patient each (Table 2).

Table 1. General characteristics of diabetic patients (with or without cutaneous manifestations)

Characteristics	Specific cutaneous disorders	
	Present	Absent
Total		
Total patients (n=100)	64	36
Males (n=32)	15	17
Females (n= 68)	49	19
Type 1 Diabetes (n=6)	3	3
Type 2 Diabetes (n=94)	61	33

Table 2. Types of skin lesions in diabetes mellitus.

Type of skin lesions	Number of patients
Infections	43
Bacterial infection	17
Cellulitis	6
Furuncles & carbuncles	9
Folliculitis	2
Fungal infection	26
Candidal	12
Onychomycosis	10
Tinea corporis	4
Pruritis	17
Skin tags	15
Lichen planus	5
Diabetic foot	5
Acanthosis nigricans	4
Eruptive xanthomas	3
Eczema	3
Vitiligo	2
Diabetic dermopathy	1
Xerosis	1
Psoriasis	1



Fig. 1 Onychomycosis Fig.2 Acanthosis nigricans

Discussion

Diabetes mellitus (DM) is considered a modern epidemic disease that affects about 8.3% of the world's population and 46% cases are estimated to be still undiagnosed.¹³ DM has extensive impact on human body but skin, despite being the largest organ in the body has received minimum attention and dermatological complications remained relatively under explored.¹⁴

Skin manifestations has become more common with the increase in the prevalence of diabetes.⁷ An overall prevalence of skin disorders in DM varied from 51.1 to 97% in different regions of the world.¹⁵ In our study, 64% patients of DM had skin manifestations which is close to a study done at Lahore that found 58% patients with skin lesions¹⁶ but Koharo et al did a study at Mirpur Khas showing 80% skin involvement in diabetic patients which shows marked variation.¹⁷

Majority of our patients 35(35%) had single type of skin lesion which is in contrast to study done by Furqan et al which showed that most patients had more than one lesion i.e. 30%.⁵

The most frequent finding was skin infections in 43% of the patients. The prevalence of skin infections in other local studies was 30.9% and 72%.^{12,18} Fungal infections 26% were more common in our study than bacterial infections 17(17%) while Khoharo et al found more bacterial infections in 50% of the cases than fungal infections (16.6%).¹⁷ This variability in the incidence of various infections among patients of different regions of the country can be due to exposure to climatic and working conditions.

The second most common finding was pruritis found in 17% cases. In a study conducted in Iran, the most common noninfectious manifestation also was pruritus.¹⁵ Local studies showed incidence of only 1.1%.⁵ Skin tags, most commonly associated with hyperinsulinemia, were present in 15% cases. Kahana et al did a study on 216 patients with skin tags and found DM in 57(26.3%) of the patients and 17 patients (7.9%) had impaired glucose tolerance test. Another study by Thappa et al had found diabetes in 62.8% of the patients with skin tags.⁹

Lichen planus is an uncommon disorder affecting 2-4% patients with T1DM or T2DM.⁷ Lichen planus was found in 5% of cases in our study which is close to another local study which showed incidence of 3.3%.¹⁷ Diabetic foot was present in 5% patients. Similar incidence of 5.9% was found in other local study.⁵ Acanthosis nigricans, usually seen in situations of insulin resistance and can be predictive for developing T2DM⁷ was found in 4% patients in our study. Bhat *et al* found AN in 5.3%⁹ of the diabetic patients but our local studies showed variable results of 5.8%¹⁷ and 19%.⁵

Eruptive Xanthomas were found in 3% of the patients which is consistent with a local study done at Battagram showing incidence of 2.6%.¹⁸ These lesions can be the first sign of diabetes and occurs more in patients with poor control of T2DM.⁷ Eczema was found in 3(3%) of our patients. Sasmaz et al showed skin eczemas in 15.2 % patients of diabetes.¹⁵ Vitiligo is commonly associated with T1DM due to autoimmune nature of both diseases. It has a worldwide incidence of 0.3-0.5%.⁷ but we found in only 2% cases. A local study showed incidence of 5.7% which is higher than our study.¹⁸ The low incidence in our study might be due to only 6 patients with T1DM.

Xerosis was found in one patient, but study done at Mirpur Khas showed it in 5% patients.¹⁷ Xerosis

showed high heterogeneity and international studies showed a high incidence of xerosis 44 % as its prevalence may be affected not only by the type of DM but also by the regional changes in climate and humidity.¹⁵ Diabetic dermopathy was one found in one patient in present study. Its incidence may range from 7% to 70% in diabetics; more common in older, elderly patients with long standing DM.¹³ As we have only 20 patients with diabetes of more than 20 years duration in our study, so its incidence was low. In our study, psoriasis was seen in one patient. Psoriasis has been reported in 9% of people with diabetes. Psoriasis may increase the predisposition for developing DM later in life so clinicians should keep check on patients with psoriasis for the presence of DM.⁷

None of our patients were found to have necrobiosis lipoidica as it occurs in only 0.3% to 1.6% of diabetic patients, diabetic bullae and scleroderma diabetorum, yellow skin, or granuloma annulare.¹⁹ There were some limitations of our study. Although diabetic foot with gangrene is quite common in our population, but most of these patients are routinely admitted in surgical wards so we could not find these patients in large number. As the hospital caters patients with low socioeconomic group, so poor hygiene and lack of affordability of health services can be the reason behind higher incidence of skin infections in our study.

Conclusion

Early recognition of cutaneous markers not only helps in an earlier diagnosis of undiagnosed DM but also serves as a sign to recognize suboptimal management of known disease. In time identification of cutaneous manifestations should prompt clinicians to screen for pre-diabetes and diabetic states and better glycemic control results in a reduction of complications.

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