

Original Research Article

CUTANEOUS MANIFESTATIONS OF DIABETES MELLITUS -A CROSS SECTIONAL STUDY

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A B S T R A C T

Background: Diabetes mellitus is a metabolic disorder that can affect multiple organ systems. Skin involvement in diabetes mellitus (DM) is very common, and most of them have some form of cutaneous involvement during the course of their disease. The aim of our study was to evaluate the prevalence and pattern of cutaneous disorders among patients with diabetes mellitus.

Materials and Methods: Three hundred patients of diabetes mellitus above the age of 18 years with dermatological manifestations were enrolled in the study. A detailed physical and dermatological examination was done and findings recorded. Relevant investigations including complete haemogram, diabetic profile, KOH mount, culture & sensitivity, woods lamp examination, biopsy was done if indicated.

Results: In our study we included 300 patients of diabetes mellitus with cutaneous manifestations. Cutaneous infections were the most common manifestation seen in 43%(n=130) of the total study population followed by diabetic dermopathy in 9.3%(n=28) and xerosis in 6.7%(n=20). Males comprised of 59% and females accounted for 41% of the study population.

Conclusion: Patients with diabetes mellitus may present with variety of skin abnormalities. Recognition and management of these conditions is important in improving the quality of life and in avoiding serious adverse effects in patients with diabetes mellitus.

Keywords: Diabetes mellitus, Cutaneous manifestations, Xerosis, Diabetic dermopathy.

INTRODUCTION

Diabetes mellitus is a heterogeneous group of disorders associated with abnormal carbohydrate metabolism marked by impaired insulin action, insulin secretion, or both, leading to elevated blood glucose levels. It is a global health challenge, affecting millions of individuals and imposing a significant burden on healthcare system. Complications of diabetes are the result of metabolic, hormonal, environmental, and genetic factors, manifesting in every organ system.^[1] According to various studies, 30 to 91% of diabetic patients experience at least 1 cutaneous complication.^[2] Abnormalities of insulin and elevated blood glucose level lead to metabolic, neurological vascular. and immunological abnormalities. Affected organs include

cardiovascular, renal, nervous system, eyes and the skin. The skin is affected by both, acute metabolic derangements and the chronic degenerative complications of diabetes. Skin, the largest organ of the body is capable of reflecting these changes in a striking manner and some of the cutaneous markers have been labelled as cutaneous manifestations for this metabolic disorder.^[3] Patients with DM may present with different cutaneous manifestations, some of which are specific to DM, while others are non-specific or secondary to metabolic changes. Patients with T2 DM have an increased susceptibility to cutaneous infections (i.e., staphylococcal pyodermas, candidiasis, erythrasma and dermatophyte infections). At the same time, patients with T1DM have a tendency to develop autoimmune related cutaneous disorders.^[4] The importance of skin manifestations lies in fact, that they are often the first pointers to the diagnosis or deterioration of the disease. Our study was conducted to evaluate the prevalence and pattern of cutaneous disorders among patients with diabetes mellitus.

MATERIALS AND METHODS

This was a hospital based, cross sectional study. The study was undertaken from April 2024 to October 2024. Three hundred patients of diabetes mellitus above the age of 18 years with dermatological manifestation, attending Dermatology OPD at a Teritiary Hospital located in south India were enrolled in the study. Patients with other systemic diseases, pregnant and lactating women were excluded from the study.

A detailed clinical history including demographic details, family history, drug history, duration of diabetes mellitus, previous history of skin diseases, were recorded in a proforma after obtaining informed consent from each individual patient. A detailed physical examination and dermatological examination was done and findings recorded. Relevant investigations like complete haemogram, diabetic profile, KOH mount, culture & sensitivity, wood s lamp examination, biopsy was done when indicated.

Data was compiled in Microsoft Excel and analyzed with SPSS 21 version software. Qualitative data was represented by frequencies and proportions and analyzed.

RESULTS

In our study we included three hundred patients of diabetes mellitus with cutaneous manifestations. Males comprised of 59%(n=176) and females accounted for 41%(n=124) of the study population. Male to female ratio was 1.42:1. Mean age among the males was 56.5 ± 13.6 years and among females was 59.2 ± 14.5 years.

In our study, age group varied from 19 to 78 years. Minimum age was 19 years and maximum 78 years. Maximum number of patients were in the age group of 51-60 years(n=78), followed by age group of 41-50 years(n=69). (Table 1)

Table 1: Age distribution of Diabetic patients				
Age(Years)	No .of Patients	Percentage(%)		
18-30	17	5.7		
31-40	40	13.3		
41-50	69	23		
51-60	78	26		
61-70	61	20.3		
>70	35	11.7		

In the present study, type 2 diabetes mellitus (91%) was more common than type 1 diabetes mellitus (9%) (Figure 1).



Figure 1: Pie Diagram Showing Type of Diabetes Mellitus

Cutaneous infections were the most common manifestation seen in 43%(n=130) of the total study population followed by diabetic dermopathy in 9.3%(n=28) and xerosis in 6.7%(n=20) (Table 1). Acanthosis nigricans and acquired perforating dermatoses was seen in 6.3% of the study population, acrochordons (4%), eczema(3.3%), icthyosis (3.3%), psoriasis (2.5%), trophic ulcer (2.3%), prurigo nodularis (2%), vitiligo (2%), lichen planus (1.6%), granuloma annulare (1.6%) and others (Table 2).

Table 2: Pattern of Cutaneous Manifestations				
Cutaneous Manifestations	No of Patients (n=300)	Percentage(%)		
Diabetic dermopathy	28	9.3		
Acquired perforating dermatoses	19	6.3		
Necrobiosis lipoidica	4	1.3		
Acrochordan	12	4		
Xerosis	20	6.7		
Vitiligo	6	2		
Psoriasis	8	2.5		
Infections	130	43		
Lichen planus	5	1.6		
Bullous pemphigoid	3	1		
Acanthosis nigricans	19	6.3		
Icthyosis	10	3.3		
Diabetic bullae	4	1.3		

Prurigo nodularis	6	2
Hidradenitis suppurativa	2	0.6
Trophic ulcer	7	2.3
Eczema	10	3.3
Granuloma annulare	5	1.6
Scleredema diabeticorum	2	0.6

Among infections, fungal infection was most common seen in 76% (n=99) patients followed by bacterial in 20% (n=26) and viral infection in 3.8% (n=5) (Table 3).

Among the fungal infections, dermatatophytosis was most common seen in 49% of the study population. Candida infection (oral and skin) was seen in 27%. Bacterial infections was seen in 26% and herpes zoster in 3.8% patients.

Table 3: Pattern of Cutaneous Infections		
Cutaneous infections	No of Patients(n=130)	Percentage(%)
A. Bacterial infection	26	20
1.Folliculitis	10	7.7
2.Furunculosis	06	4.6
3.Cellulitis	05	3.8
4.Erysipelas	03	2.3
5.Erythrasma	02	1.5
B. Fungal infection	99	76
1.Dermatophytosis	64	49.2
2.Candidiasis		
-Vulvovaginal	08	6
-Oral	07	5.3
-Balanoposthitis	09	6.9
-Toewebspace Intertrigo	11	8.5
C. Viral infection	5	3.8
1.Herpes zoster	5	3.8



Figure 2: Herpes zoster in Diabetic patient



Figure 3: Candidal intertrigo



Figure 4: Acrochordans



Figure 5: Diabetic dermopathy



Figure 6: Dermatophytosis (Tinea corporis)



Figure 7: Reactive perforating collagenosis



Figure 8: Perforating folliculitis



Figure 9: Psoriasis in a diabetic patient

DISCUSSION

Diabetes mellitus (DM) is the most common endocrine disorder. Most of the cutaneous disorders are related to complications of diabetes like neuropathy (diabetic foot), microangiopathy (diabetic dermopathy), immunologic dysfunction (infections), insulin resistance (acanthosis nigricans) etc.^[5]

We included 300 patients with diabetes mellitus above the age of 18 years. Males constituted majority of our study group of about 59% and females constituted 41% with male to female ratio of 1.42:1. Similar observation was made by Nigam et al.^[6] Whereas females outnumbered males in studies by Timshina et al and Mahajan et al.^[7,8]

In the present study, type 2 diabetes mellitus (91%) was more common than type 1 diabetes mellitus (9%) which is in corcordance with the studies by Timshina et al, and Vahora et al.^[7,9]

In our study, maximum number of patients were in the age group of 51-60 years, followed by age group of 41-50 years, whereas in a study by Mahajan et al the most common age group was 41-50 years.

Cutaneous infections were the most common manifestation seen in 43% of the total study population followed by diabetic dermopathy in 9.3% and xerosis in 6.7%. Cutaneous infections was the most common dermatoses observed in studies by Nigam et al(26.5%) ,Mahajan et al(27.3%),Timshima et al(47%), Vahora et al (40%), Niaz et al(48%). 6-10Xerosis was the most common manifestation reported in a study by Goyal et al,^[11] whereas acrochordan was the most common manifestation in a study by Ragunatha et al.^[12]

Among infections, fungal infection was most common seen in76% of patients followed by bacterial in 20% and viral infection in 3.8%.Similar findings of increased fungal infection was observed in studies by George et al and Roslind et al.^[13,14] Increased rate of infections in DM patients can be to Impaired phagocytosis, delayed attributed neutrophil chemotaxis, reduced leukocyte and abnormal adherence. microcirculation peripheral Associated atherosclerosis and neuropathy also may contribute, by delaying wound healing.[15]

In our study diabetic dermopathy was observed in 9.3% of patients as compared to 6.3% by Timshina et al, 2.3% by Vahora et al and 9% by Niaz et al,^[7,9,10] Diabetic dermopathy also known as shin spot or pigmented pretibial papules are multiple, bilateral, annular or irregular, erythematous papules or plaques that gradually evolve into atrophic, hyperpigmented macules. The lesions often resemble posttraumatic hyperpigmentation, but there is no history of trauma. Though commonest on the shins, they may also occur on the thighs or forearms. Older lesions may persist or disappear while newer lesions appear.^[15]

Xerosis was observed in 6.7% of patients as compared to 18.8% by Timshina et al, 5.6% by Vahora et al.^[7,9] In diabetes xerosis is often linked to microvascular complications and can increase the risk of infections and diabetic foot ulcers.^[16]

Acquired perforating dermatoses was seen in 6.3% of patients and similar observations were found in other studies.^[7-11] In acquired perforating dermatoses keratotic papules, nodules, and occasionally vertucous plaques are noted on areas of friction, with the trunk and extremities most commonly involved. Pruritus is usually severe.^[15]

Acanthosis nigricans was present in 6.3% of patients and comparable results were described by Nigam et al and Vahora et al.^[6-9] The ocurrence of this hyperpigmented, velvety, flexural skin in DM may be related to insulin binding of insulin-like growth factor receptors on keratinocytes and dermal fibroblasts.^[17]

Trophic ulcers was seen in 2.3% of our patients as compared to 16% by Niaz et al and 3% by Nigam et al.^[6,10] These ulcers occur on the soles, especially at sites of pressure under the metatarsal heads, and may develop from calluses. Resultant osteomyelitis is common. Peripheral neuropathy, microangiopathy, or both, along with infection contribute to this problem.^[18]

Diabetic bullae reported in several studies by Nigam et al(1%), Vahora et al(0.6%), Niaz et al(2%) was seen in 1.3% of our study population. Diabetic bullae most commonly occur on the dorsa and sides of the lower legs and feet, although the forearms and hands may sometimes be affected. Ranging in size from a few millimeters to several centimeters, the bullae have a noninflamed base and contain clear sterile fluid. The blisters are usually painless and nonpruritic.^[5]

Among other dermatoses icthyosis, acrochordan, eczema, vitiligo, psoriasis, lichenplanus and vitiligo were observed in our study population. Similar dermatoses were observed in other studies.^[6-8]

CONCLUSION

Patients with diabetes mellitus may present with a variety of skin abnormalities and the most common being cutaneous infection, diabetic dermopathy and xerosis as seen in our study and previous studies. Diabetes mellitus remains a complex and multifaceted disorder. Early diagnosis, effective glycemic control, and prevention of complications are paramount in providing optimal care to individuals with diabetes. Some prophylactic and remedial measures can prevent or decrease some of the adverse changes. Long follow up is needed to reduce the morbidity associated with dermatoses. An inter-disciplinary approach involving

dermatologists and physicians is essential to improve the quality of life of patients with diabetes mellitus.

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