

# A Clinical Study about Cutaneous Manifestations of Diabetes Mellitus in a Tertiary Care Hospital.

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## ABSTRACT

**Background:** Diabetes mellitus (DM) is the most common endocrine disorder. Mucocutaneous manifestations of DM are many and vary from trivial to life-threatening and often herald the onset of diabetes. Aims: To study the incidence of mucocutaneous manifestations in diabetes mellitus with respect to demographic data such as age, sex and duration of diabetes mellitus. **Methods:** This is cross-sectional observational study of 200 diabetic patients with cutaneous manifestations attending skin and diabetic clinic OPD. Detailed history, clinical examination and relevant investigations were done to diagnose the mucocutaneous disorders and complications of diabetes. **Results:** Demographic profile showed majority of cases belonging to 5th decade (33%) and 4th decade(27%) with male preponderance. Cutaneous infections were most common (62%) followed by the dermatoses more commonly associated with diabetes (58%). Some patient had more than one cutaneous manifestation. **Conclusion:** Proper skin care and long-term control of blood glucose may reduce the risk of complications and is immensely beneficial to patient in long run.

**Keywords:** Cutaneous manifestation, Diabetes Mellitus.

## INTRODUCTION

Diabetes mellitus (DM) has emerged as major public health problem of our country, and our country has its distinction of having the largest number of diabetics in the world.<sup>[1]</sup> Skin is affected by both acute metabolic derangements and the chronic degenerative complications of diabetes.<sup>[2]</sup> The pathogenesis of complications of DM is due to chronic hyperglycemia resulting in production of advanced glycosylation end products (AGE).<sup>[3]</sup> Only a few epidemiologic studies have been done on the prevalence of skin disorders in patients with diabetes mellitus. This study is an attempt to analyse the pattern of cutaneous manifestations of diabetes mellitus in view of its increasing prevalence in general population.

## MATERIALS AND METHODS

The present study was a cross-sectional observational study conducted in out patient departments of Diabetes clinic and Dermatology Venereology and Leprology of Governmental General Hospital, Anantapur, between November

2014 and October, 2015. Institutional clearance was obtained before the start of the study. Two hundred diabetics with cutaneous manifestations irrespective of age, sex and duration of disease were enrolled in the study. Those not willing to participate were excluded. Pre-designed and pretested proforma was filled after taking informed consent. Confidentiality was maintained. Detailed histories regarding skin complications, demographic data, DM and its treatment, family history of DM were taken. Medical Records were reviewed for information of duration, medications and complications of diabetes. All cases were subjected to through cutaneous and mucosal examination to observe for the presence of specific and non-specific dermatoses associated with DM

All cases were subjected to baseline investigations such as complete blood count. Urine examination, fasting and random blood sugar. Scraping and direct KOH examination and culture for fungus in Sabourauds agar and Gram staining and culture of pus to identify bacteria were done wherever indicated. Histopathological investigations were carried out in selected case.

## RESULTS

The epidemiological profile revealed increased incidence in males (69%) compared to females(31%) with male to female ratio of 2.2:1. The age the patient ranged from 13 years with peak prevalence in the age group of 51-60 years (33%). The duration of DM was 1-5 years in 80 cases (40%) and 6-10 years

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in 52 cases (26%). Among 200 patients 192 (96%) cases had type II DM and 8 (4%) cases had Type I DM. Random blood sugar was 140-200 mg/dl in 49%, and >200 mg/dl in 295 of patients. 118 (59%) patients showed associated systemic diseases. Hypertension was the commonest (51%) systemic disease followed by ischemic heart disease (17%). Some had more than one associated systemic disease.

Pattern of cutaneous manifestations in DM listed in Table 1. Cutaneous infections formed the largest group of dermatoses (62%) among which fungal infections were predominant (37%), followed by bacterial (21%) and viral infections (4%). Among the fungal infections Tinea cruris was common (13.5%). Followed by Tinea corporis (11.5%). 3% each of candidalintertrigo. Tineaunguim. Pityriasis versicolor and 1% each of candidial balanoposthitis, chronic paronychia. Among the bacteria infections, furuncles were present in 11% folliculitis and cellulitis each in 3%, abscess in 2%, erysipelas and carbuncle each in 1% of patients. Verruca vulgaris and herpes zoster each found in 2% of patients.

**Table 1: Pattern of cutaneous manifestations.**

Dermatoses	No. of cases	Percentage (%)
Cutaneous infections	124	62
Bacterial	42	21
Fungal	74	37
Viral	8	4
Dermatoses associated with microangiopathy	16	8
Diabetic dermopathy	14	7
Necrobiosis lipoidica	2	1
Neuropathic and ischemic diabetics skin disease	26	13
Diabetic foot ulcer	14	7
Gangrene of foot	12	6
Metabolic complications	4	2
Xanthelesmapalpebrum	4	2
Dermatoses most commonly associated with Diabetes	116	58
Generalised pruritus	46	23
Acrochordons	16	8
Psoriasis	14	7
Vitiligo	8	4
Progressive pigmented Purpura	6	3
Kyrles disease	6	3
Lichen planus	4	2
Cutaneous reactions to therapy with insulin	2	1
Non-specific manifestations of DM	40	20
Eczema	26	13
Xerosis	12	6
Seborrheic keratosis	4	2
Pemphigus	4	2
Drug reactions	4	2
Scabies	4	2
Lethyosis	4	2
Disorders of collagen	4	2
Seleredema diabeticorum	4	2

**Table 2: Cutaneous manifestations of DM in seven Categories.**

Dermatoses	No. of Cases	Percentage (%)
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Cutaneous infections	124	62
Dermatoses associated with	16	8
Neuropathic and ischemic Diabetic skin disease	26	13
Metabolic complications	4	2
Dermatoses most commonly Associated with DM	116	58
Cutaneous reactions to therapy for diabetes mellitus	2	1
Non-specific manifestations	82	41
Disorders of collagen	4	2



**Figure 1: Candidal Intertrigo over foot**



**Figure 2: Insulin site Lipodystrophy on Arm.**

In the group of dermatoses commonly associated with DM, generalised pruritus was predominant (23%), followed by acrochordons (8%), psoriasis(7%), vitiligo and acanthosis nigricans (4%), progressive pigmented purpura and kyrles(3%), lichen planus and cherry angiomas (2%), and macular amyloidosis (1%).

In the category of non-specific manifestations of DM eczema (40%) was predominant. Followed by xerosis (26%), seborrheic keratosis (12%), and pemphigus, drug reactions, scabies, and ichthyosis

(4%). Among dermatoses associated with microangiopathy, 14(7%) cases had diabetic dermopathy and 2(1%) cases presented with necrobiosis lipoidica.



Figure 3: Xerosis over both legs.

Among neuropathic and ischemic diabetic skin disease diabetic foot ulcers were found in 14(7%) case and gangrene of foot in 12(6%) cases. Xanthelesma-palpebrum was found in 2% of cases. Out of 200 patients, 164 were on anti-diabetic treatment. 2(1%) cases being treated with insulin developed insulin site reaction.

## DISCUSSION

The cutaneous manifestations of DM are extremely valuable to the clinician because of their numerous and complicated repercussions. They generally appear after the primary disease has developed but may signal or appear coincidentally with its onset or even precede diabetes by many years. In our study we have placed cutaneous manifestations of DM in seven categories as listed in [Table 2].

In the present study majority of the cases belonged to fifth and fourth decade (33% and 27% respectively). Bhat et al and Mahajan et al in their studies on.<sup>[2,4]</sup>

DM documented the most common age group to be of 41-50 years in 33.3% and 33%. Respectively. The increase in frequency of cutaneous involvement and complications of diabetes with age may be attributed to the long duration of DM.<sup>[5]</sup> Similar to the observations of sawhney et al Rao et al.<sup>[6,7]</sup> We found more male diabetics with cutaneous manifestations than females (69% Vs.31%).

Chronicity of diabetes plays a big role in cutaneous manifestations. In the present study 66% of the patients had duration of <10 years, which correlated with the findings of Bhat et al and Rao et al.<sup>[2,7]</sup> As the duration of diabetes increased, there was non-enzymatic glycosylation of dermal collagen and mucopolysaccharides resulting in various cutaneous manifestations.<sup>[2]</sup>

Type.11 DM was seen in 98% and 97.7% of the patients in studies by Mahajana et al and Bhat et al

respectively.<sup>[2,4]</sup> In the present study 96% of the patients had type II D M. and 4% had type I DM. No difference in the distribution of dermatoses between patients with type I and type II DM has been noted similar to the findings of Mutairi et al and Nigam and Pande Among associated systemic diseases hypertension was found in 102 patients (51%).<sup>[5,8]</sup> Ischemic heart disease in 34 patients (17%) and chronic renal failure in 10 patients (5%). Mahajan et al and Bhat et al also found hypertension to be the commonest (53.1% and 46.6% respectively) associated systemic disease.<sup>[2,4]</sup> Hypertension has been hypothesised to accelerate the process of microangiopathy in diabetics.

In the present study as listed in [Table 2], cutaneous infections were found to be the commonest dermatoses (62%), similar to the observations of Nigam and Pande.<sup>[8]</sup> The increased incidence of cutaneous infections in diabetics may be related to abnormal microcirculation, Diabetic neuropathy, decreased phagocytosis, impaired leukocyte adherence and delayed chemotaxis.<sup>[9,10]</sup> In the present study cutaneous fungal infections were the commonest (37%) followed by bacterial (21%) and viral(4%). The large incidence of fungal infections may be due to most of our patients belonging to the low socio economic group residing in slum areas where hot and humid conditions, overcrowding exist.

Diabetic dermopathy was seen in 14 patients (7%) whereas Nigam and Pande Mahajan et al reported 34.5% and 7% respectively.<sup>[4,8]</sup> Though diabetic dermopathy is considered as the most common cutaneous manifestation in diabetics. Such observation was not found in the present study. This can be attributed to dark skinned individuals in the Indian sub continent. Necrobiosis Lipoidica (NL) is a necrobiotic disorder. Nigam et al reported 1.3% cases of NL.<sup>[8]</sup> In the present study two patients (1%) had NL.

In the present study 26 patients had neuropathic and ischemic diabetic skin diseases of which 14 had diabetic foot ulcers and 12 had gangrene of foot. Bhat et al observed four cases of diabetic foot ulcer while Mahajan et al reported six cases.<sup>[2,4]</sup>

In the present study four cases had seleroedemadiabeticorum. Mahajan et al. reported two cases of seleroedemadiabeticorum.

Among the dermatoses associated with DM in the present study, generalised pruritus was most common (23%). This is similar to the findings of AL.mutairi et al.<sup>[5]</sup> It is believed that generalised itching, at least in some cases of DM. Cannot be explained by any other cause except by underlying DM.<sup>[5]</sup>

In the present study 8% diabetics had skin tags where as acanthosis nigricans was present in 4% patients. Acrochordons and acanthosis nigricans are manifestations of insulin resistance, which may be present before the experience of DM. Increased

levels of insulin acts on insulin-like growth factor (IGF) receptors, resulting in acanthosis nigricans.<sup>[3]</sup> Acrochordon has been regarded as assign of increased glucose tolerance, DM and increased Cardiovascular risk.<sup>[11]</sup>

Psoriasis was present in 14(7%) patients. Sezai et al reported psoriasis coexisted with type II DM in 11.2% of cases.<sup>[12]</sup> An association between psoriasis and increased cardiovascular risk and metabolic syndrome has been reported.

Dermatoses with underlying autoimmune pathogenesis like vitiligo are known to occur in DM as a part of polyglandular autoimmune syndrome. Patients with vitiligo, lichen planus and cutaneous performing dermatoses are reported to have an increased incidence of impaired glucose tolerance or frank DM. 31. In the present study vitiligo was seen in 4% (8) of cases, Kyrle's disease in 3% (6) and lichen planus in 2% (4) of patients, Oral lichen planus has been suggested to occur with increasing frequency in DM. However, such an association was not observed in several other studies including the present one.

In the present study out of 164 patients on treatment it was observed two patients (1%) had insulin site reactions. The reactions are due to impurities in insulin preparations such as bovine or porcine proteins Lower prevalence of insulin reactions in the present study may be due to the use of human insulin.<sup>[13]</sup>

Out of 82 patients with non-specific manifestations majority of them had eczema (2%). Xerosis in 13% 12 patients (6%) had seborrheic keratosis. 4 patients Each (2%) had pemphigus, drug reactions, ichthyosis, and scabies.

The occurrence of non-specific cutaneous disorders has pathogenic, prognostic and the loss of cutaneous barriers in non-specific disorders increases susceptibility to chronic and recurrent infections. This could also lead to likelihood of exposure to contact allergens resulting in eczemas. Accelerated aging of skin has been reported in patients of DM.<sup>[14]</sup> However, in the present study, Seborrheic keratosis is mainly due to chronologic aging.

## CONCLUSION

The Present study was undertaken to know the spectrum of cutaneous manifestations in DM. Infections were found to be the commonest dermatoses in diabetics. Cutaneous manifestations can heighten the suspicion of a Physician regarding the diagnosis of DM. This further helps to prevent systemic derangements by early initiation of appropriate treatment. Proper skin care and long-term control of blood glucose levels may reduce the risk of some of the skin lesions in diabetes. Thus, dermatologist can play an important role in reducing

morbidity, improvement of quality of life, and management of diabetic patients.

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