

## Original Research Article

# A clinical study of diabetic dermatological manifestations at a tertiary care hospital in South India

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### ABSTRACT

**Background:** The data on studies like lesions of the skin due to diabetes are scarce. Hence there is a need to conduct more studies on this topic of importance. The objective of the study was to study diabetic dermatological manifestations.

**Methods:** A hospital based cross sectional study was carried out among 100 randomly selected patients during the study period of one year who were having diabetes as well as skin lesions due to diabetes. All diabetic patients were screened for presence of skin lesions. They were further differentiated based on the diagnosis.

**Results:** Out of 73 patients having cutaneous infections 71.2% were having fungal infections. Out of 18 having bacterial infections 38.9% were having furuncles. Out of 52 having fungal infections 63.5% were having dermatophytosis. Out of 14 cases of candidal infections, the most common was intertrigo in 35.7%. Out of 33 cases of dermatophytosis, *T. cruris* was the most common in 54.5%. Out of 82 patients in whom we suspected dermatoses strongly associated with diabetes the most common condition was pruritus in 36.6% of the cases.

**Conclusions:** Bacterial skin infections and dermatophytosis were the most common diabetic dermatological lesions in the present study.

**Keywords:** Cutaneous manifestations, Type II diabetes, Furuncles

### INTRODUCTION

Diabetes affects all age groups. Also it affects people from all social classes. It is an endocrine disorder and hyperglycemia is the characteristic feature of it. The insulin deficiency may be absolute as seen in type I diabetes or it may be partial as seen in type II diabetes. It was estimated that around 171 million new cases of diabetes occurred in 2000 which is likely to increase to 366 million new cases of diabetes by 2030.<sup>1</sup>

One of the complications of long standing diabetes is lesions of the skin. It has been estimated that around 30%

of the patients suffering from diabetes may have lesions of the skin.<sup>2</sup>

Patients with diabetes can survive longer with proper control of blood sugar and they tend to develop a variety of complications. Diabetes involves disturbances in the metabolism of the proteins, lipids and carbohydrates. These disturbances can lead to signs of physical ill health among these patients. It has been estimated that around 30% of the patients suffering from diabetes may have lesions of the skin. They are of four types. First is directly due to diabetes. Second are lesions of skin due to infections of the skin. Third are lesions of skin due to other complications of diabetes and fourth is due to

reaction of the body of the patient to insulin or oral hypoglycemic drugs. The list of lesions of the skin caused due to diabetes is long but mainly they are diabetic dermopathy, diabetic bullae, necrobiosis lipoidica, diabetic thick skin, yellow nails etc.<sup>3</sup>

Diabetics are prone to various infections due to the fact that their immune system is compromised. They are also prone to develop skin viral infections like warts or herpes zoster. Other skin disorders seen among these diabetic patients are gangrene of foot, waxy skin etc.<sup>4</sup>

The baseline derangements in the metabolic processes damage the skin among the patients with diabetes. Not only has this but the long standing degenerative nature of complications involved in the diabetes also affected the skin in the diabetes patients. The underlying mechanism for lesions of skin due to diabetes is poorly understood. Suggested pathogenetic mechanism is disturbed metabolism of carbohydrates and other reasons like impairment in the mechanisms of the host etc.<sup>5</sup>

The data on studies like lesions of the skin due to diabetes are scarce. Hence there is a need to conduct more studies on this topic of importance. Hence present study was planned with the objective to study diabetic dermatological manifestations.

## METHODS

### Study design

Present study was hospital based cross sectional study

### Study period

Study was carried out for a period of one year from May 2017 to April 2018

### Study place

Study was carried out at Department of Dermatology, Venereology and Leprosy, Malla Reddy Institute of Medical Sciences, Suraram, Hyderabad, Telangana, India

### Sample size

A total of 100 randomly selected patients were enrolled for the present study who were having diabetes as well as skin lesions due to diabetes. All diabetic patients were asked to come to the Department of Dermatology, Venereology and Leprosy, Malla Reddy Institute of Medical Sciences for dermatology screening. Confirmed cases of diabetes with skin lesions due to diabetes were included.

### Ethical considerations

Institutional Human Ethics Committee permission was taken before the study data collection was started.

Informed consent was obtained from enrolled patients. All patients were given appropriate treatment for skin lesions and for diabetes treatment they were referred to General Medicine Department for further management.

### Inclusion criteria

Inclusion criteria were confirmed cases of diabetes with skin lesions; all ages; both sexes.

### Exclusion criteria

Exclusion criteria were diabetes without skin lesions; patients not willing to participate in the present study.

### Methodology

First of all patients were confirmed to have diabetes by looking at their treatment records and blood sugar levels. All confirmed cases of diabetes were screened for presence of skin lesions on a continuous basis daily or most of the days of a week at Department of Dermatology, Venereology and Leprosy, Malla Reddy Institute of Medical Sciences.

Those found to have skin lesions along with diabetes were asked their willingness to participate in the present study. Cutaneous infections were classified as bacterial, viral and fungal skin infections. They were further sub divided as per the findings.

Detailed history was taken to trace the source of infection. Thorough skin examination was carried out and skin lesions were identified and recorded.

All data was recorded in the pre designed, pre tested, and semi structured study questionnaire developed for the present study. Patients were classified as per the clinical types. The samples were sent for culture to confirm the clinical diagnosis in required cases. Treatment was initiated based on the final diagnosis.

### Statistical analysis

Data was analyzed using proportions.

## RESULTS

**Table 1: Distribution of study subjects as per cutaneous infections.**

Type of cutaneous infections	Number	%
<b>Fungal</b>	52	71.2
<b>Bacterial</b>	18	24.7
<b>Viral</b>	3	4.1
<b>Total</b>	73	100

Out of 100 cases studied, 73 were having cutaneous infections. Out of these, 52 (71.2%) were having fungal

infections followed by 18 (24.7%) with bacterial infections and only three were found to have viral skin infections.

**Table 2: Distribution of study subjects as per bacterial infections.**

Type of bacterial infections	Number	%
Furuncles	7	38.9
Folliculitis	3	16.8
Cellulitis	2	11.1
Nail infections	2	11.1
Impetigo	2	11.1
Carbuncle	1	5.6
Erythrasma	1	5.6
Total	18	100

Out of 100 cases studied, 18 were found to have bacterial infections. Among them majority i.e. 7 (38.9%) were found to have furuncles followed by folliculitis in three cases. carbuncle and erythrasma were found in one case each.

**Table 3: Distribution of study subjects as per fungal infections.**

Type of fungal infections	Number	%
Dermatophytosis	33	63.5
Candidiasis	14	26.9
Pityriasis versicolor	5	9.6
Total	52	100

Out of 100 cases studied, 52 were having fungal infections. Among them, 33 (63.5%) were having dermatophytosis followed by candidiasis in 26.9% of the cases. five patients were having pityriasis versicolor.

**Table 4: Distribution of study subjects as per candidal infections.**

Type of candidal infections	Number	%
Intertrigo	5	35.7
Balanoposthitis	4	28.6
Paronychia	2	14.3
Vulvovaginitis	2	14.3
Oral candidiasis	1	7.1
Total	14	100

Out of total 14 cases of candidal infections, the most common was intertrigo in 35.7% of the cases followed by balanoposthitis in 28.6% of the cases. Only one patient was found to have oral candidiasis.

Out of 33 cases of dermatophytosis with diabetes T. cruris was the most common in 54.5% of the cases followed by T. corporis in 27.3% of the cases. Three patients each were found to have T. pedis and T. manuum respectively.

**Table 5: Distribution of study subjects as per dermatophytic infections.**

Type of dermatophytic infections	Number	%
Tinea cruris	18	54.5
Tinea corporis	9	27.3
Tinea pedis	3	9.1
Tinea manuum	3	9.1
Total	33	100

**Table 6: Distribution of study subjects as per viral infections.**

Type of viral infections	Number	%
Verruca vulgaris	2	66.7
Herpes zoster	1	33.3
Total	3	100

Out of three patients with viral infection, two were having verruca vulgaris and one was found to have Herpes zoster.

**Table 7: Distribution of study subjects as per dermatoses caused due to microangiopathy.**

Dermatoses caused due to microangiopathy	Number	%
Bullous diabeticorum	3	42.9
Diabetic dermopathy	2	28.5
Diabetic rubeosis	1	14.3
Necrobiosis lipoidica diabeticorum (NLD)	1	14.3
Total	7	100

7 patients were diagnosed with dermatoses caused due to microangiopathy. Among them the most common condition was bullous diabeticorum in 42.9% of the cases followed by diabetic dermopathy in 28.5% of the cases.

**Table 8: Distribution of study subjects as per type of neuropathic and ischemic diabetic skin disease.**

Type of neuropathic & ischemic diabetic skin disease	Number	%
Diabetic foot ulcer	10	55.6
Diabetic neuropathy	7	38.9
Peripheral vascular disease	1	5.5
Total	18	100

There were 18 patients with type of neuropathic & ischemic diabetic skin disease. Among them the most common was diabetic foot ulcer in 55.6% of the cases followed by diabetic neuropathy in 38.7% of the cases.

A total of three patients were having metabolic disorder. In that two patients were found to have xanthelasma palpebrarum and one case was of eruptive xanthomas.

Three patients of collagen disorders were having diabetic thick skin. Two patients reported skin reactions due to insulin and none due to use of oral hypoglycemic drugs.

**Table 9: Distribution of study subjects as per metabolic disorders, collagen disorders and cutaneous reactions due to insulin.**

Type	Sub type	Number	%
Metabolic disorder	Xanthelasma palpebrarum	2	2
	Eruptive xanthomas	1	1
Collagen disorders	Diabetic thick skin	3	3
Cutaneous reactions	Due to insulin	2	2
	Due to oral hypoglycemic drugs	0	0

**Table 10: Dermatoses strongly associated with diabetes mellitus.**

Type of dermatoses	Number	%
Pruritus	30	36.6
Acanthosis nigricans	18	21.9
Skin tags (acrochordons)	17	20.7
Cherry angiomas	9	10.9
Psoriasis	3	3.7
Lichen planus	1	1.2
Vitiligo	1	1.2
Terry nails	1	1.2
Pigmented purpuric dermatoses	1	1.2
Beau's lines	1	1.2
Total	82	100

Out of 82 patients in whom we suspected dermatoses strongly associated with diabetes the most common condition was pruritus in 36.6% of the cases followed by acanthosis nigricans in 21.9% of the cases. 17 (20.7%) of the cases were having skin tags.

## DISCUSSION

Out of 100 cases studied, 73 were having cutaneous infections. Out of these, 52 (71.2%) were having fungal infections followed by 18 (24.7%) with bacterial infections and only three were found to have viral skin infections.

Out of 100 cases studied, 18 were found to have bacterial infections. Among them majority i.e. 7 (38.9%) were found to have furuncles followed by folliculitis in three cases. carbuncle and erythrasma were found in one case each.

Out of 100 cases studied, 52 were having fungal infections. Among them, 33 (63.5%) were having dermatophytosis followed by candidiasis in 26.9% of the cases. five patients were having pityriasis versicolor.

Out of total 14 cases of candidal infections, the most common was intertrigo in 35.7% of the cases followed by balanoposthitis in 28.6% of the cases. Only one patient was found to have oral candidiasis.

Out of 33 cases of diabetics with dermatophytosis *T. cruris* was the most common in 54.5% of the cases followed by *T. corporis* in 27.3% of the cases. Three patients each were found to have *T. pedis* and *T. manuum* respectively.

Out of three patients with viral infections, two were having verruca vulgaris and one was found to have herpes zoster.

7 patients were diagnosed with dermatoses caused due to microangiopathy. Among them the most common condition was bullous diabeticorum in 42.9% of the cases followed by diabetic dermopathy in 28.5% of the cases.

There were 18 patients with other forms of skin lesions associated with diabetes. Among them the most common was diabetic foot ulcer in 55.6% of the cases followed by diabetic neuropathy in 38.7% of the cases.

A total of three patients were having metabolic disorder. In that two patients were found to have xanthelasma palpebrarum and one case was of eruptive xanthomas. Three patients of collagen disorders were having diabetic thick skin. Two patients reported skin reactions due to insulin and none due to use of oral hypoglycemic drugs.

Out of 82 patients in whom we suspected dermatoses strongly associated with diabetes the most common condition was pruritus in 36.6% of the cases followed by acanthosis nigricans in 21.9% of the cases. 17 (20.7%) of the cases were having skin tags.

Ragunatha et al noted that fungal infections of the skin were more common than bacterial. We also found that fungal infections of the skin were more common than bacterial. The author found the incidence of diabetic foot as only 0.2% compared to 10% in the present study. Insulin reactions were noted in 6.2% of the cases by the author compared to only 2% found in the present study. The authors concluded that prevalence of diabetic dermatological lesions is less common in diabetics who had good glycemic control.

Mahajan et al carried out a case control study among 100 diabetic and 100 non-diabetics.<sup>7</sup> The prevalence of skin lesions was 64% in diabetics compared to only 22% in non-diabetics. They noted that two cases were of herpes zoster. We also found only one case in our study.

Timshina et al observed that the prevalence of skin lesions was 88.3% among diabetics compared to only 36% among non-diabetics which was statistically significant.<sup>8</sup> They noted the cutaneous infections were the most common manifestation found in diabetics. This

finding matches with the finding of the present study where we found that 73% of the cases were due to cutaneous infections.

Sawatkar et al studied a total of 500 cases and noted that among them 67.8% had dermatoses.<sup>9</sup> They observed that the proportion of skin lesions was directly related to the duration of diabetes. Longer the duration of diabetes, more the risk of developing the lesions of the skin.

Yosipovitch et al found that 71% of the patients were suffering from the lesions of the skin with diabetes.<sup>10</sup> They noted that longer the duration of the diabetes, more the risk of scleroderma like skin changes and dryness of the palms and this was found to be statistically significant.

## CONCLUSION

The management of colorectal cancer has progressed over the past few decades because of many advances, including those in genetics, pathology, imaging, medical oncology, radiation oncology, and surgery.<sup>16</sup> Undoubtedly, the management of patients afflicted with colorectal cancer will evolve as advances continue to be made in the multiple disciplines that contribute to the diagnosis and treatment of colorectal cancer.

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