

## Original Research Article

# A clinical study of skin manifestations in diabetes at a tertiary hospital in Kerala

Anju Antony\*

Department of Dermatology, Karuna Medical College Hospital, Palakkad, Kerala, India

**Received:** 15 September 2021

**Revised:** 19 October 2021

**Accepted:** 20 October 2021

**\*Correspondence:**

Dr. Anju Antony,

E-mail: [anju\\_antony94@yahoo.co.in](mailto:anju_antony94@yahoo.co.in)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

### ABSTRACT

**Background:** Though extensive data is available on diabetes and its systemic manifestations, research about the skin lesions in those afflicted with diabetes is scarce. The aim of this study was to understand dermatological manifestations in diabetes.

**Methods:** A hospital based cross sectional study was carried out among 100 randomly selected diabetic patients afflicted with skin lesions due to diabetes.

**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 and all social classes. An endocrine disorder, hyperglycemia is the hallmark of diabetes. The insulin deficiency may be absolute as in type I diabetes or partial as seen in type II diabetes.<sup>1</sup>

One of the complications of longstanding diabetes is lesions of the skin. Around 30% of the patients suffering from diabetes are estimated to have skin lesions in some form.<sup>2</sup>

These are mainly 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 skin lesions due to diabetes is long but mainly comprises of diabetic dermopathy, necrobiosis lipoidica, diabetic bullae, diabetic thick skin, and yellow nails.<sup>3</sup> Diabetics are prone to develop skin viral infections like warts or herpes zoster. Other skin disorders seen among these diabetic patients are gangrene of foot, and waxy skin.<sup>4</sup> The baseline derangements in metabolic processes damage the skin among patients with diabetes. The longstanding degenerative nature of diabetic complications also affect the skin. 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 lesions of the skin due to diabetes are

scarce. The present study was planned with the objective to study diabetic dermatological manifestations.

**METHODS**

**Study design**

The study was a tertiary hospital based cross sectional study.

**Study period/place**

The study was conducted from May 2020 to April 2021 at Karuna Medical College Hospital, Palakkad, Kerala

**Sample size**

100 randomly selected confirmed diabetic patients with skin lesions were selected for the study.

Informed consent was obtained from enrolled patients. All patients were given appropriate treatment for their skin lesions and diabetes.

**Inclusion criteria**

Confirmed cases of diabetes with skin lesions of all ages and both sexes were included in the study.

**Exclusion criteria**

Diabetics without skin lesions; patients unwilling to participate in the study.

**Methodology**

Patients confirmed to have diabetes according to their treatment records and blood sugar levels were screened for presence of skin lesions on a continuous daily basis. Those found to have skin lesions were then asked for their willingness to participate in the study. Cutaneous infections were classified as bacterial, viral and fungal. 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 questionnaire developed for the study. 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 analysed using proportions. Simple statistical methods were used to quantify and analyse data. Frequencies and percentages were calculated for the necessary data and 95% confidential intervals of the percentages were also given.

**RESULTS**

Out of 100 patients, 73 were having cutaneous infections. Of these, 52 (71.2%) were having fungal infections and 18 (24.7%) bacterial, with three found to have skin lesions of viral origin (Table 1).

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

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

Of 100 patients, 18 were found to have bacterial infections with furuncles in 7 and folliculitis in 3 (Table 2).

**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

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 patients (Table 3).

**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 total 14 cases of candidial 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 (Table 4).

Out of 33 cases of diabetes with dermatophytoses, *T. cruris* was the most common, seen in 54.5% of the patients followed by *T. corporis* in 27.3% cases (Table 5).

Out of three patients with viral infection, two were having verruca vulgaris and one was found to have Herpes zoster (Table 6).

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 (21.9%). 17 (20.7%) of the cases were having skin tags (Table 7).

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

Type of candidial infections	Number	%
Intertrigo	5	35.7
Balanoposthitis	4	28.6
Paronychia	2	14.3
Vulvovaginitis	2	14.3
Oral candidiasis	1	7.1
<b>Total</b>	<b>14</b>	<b>100</b>

**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
<b>Total</b>	<b>33</b>	<b>100</b>

**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
<b>Total</b>	<b>3</b>	<b>100</b>

**Table 7: 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
<b>Total</b>	<b>82</b>	<b>100</b>

**DISCUSSION**

Out of 100 cases studied, 73 were having cutaneous infections. 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. Of

the 52 patients with fungal infections, 63.5% were having dermatophytosis and 26.9% candidiasis. The 18 patients with bacterial infections were mostly afflicted with furuncles or folliculitis. Out of three patients with viral infections, two were having verruca vulgaris and one was found to have herpes zoster.

Out of the 33 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 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.<sup>6</sup> We also found that fungal infections of the skin were more common than bacterial. 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.

**Limitations**

In this study, the sample size is 100 which is less when considering the prevalence of diabetes in a state like Kerala. This is realized to be a limitation of this study. Also, the metabolic disorders, collagen disorders and cutaneous reactions to insulin therapy could have been studied better.

## CONCLUSION

Bacterial skin infections and dermatophytosis are the most common dermatological lesions seen in diabetics. These dermatological manifestations are directly proportional to the duration of diabetes and its incidence is greatly reduced in patients with optimal glycaemic control.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the institutional ethics committee*

## REFERENCES

1. Ahmed K, Muhammad Z, Qayum I. Prevalence of cutaneous manifestations of diabetes mellitus. *J Ayub Med Coll Abbottabad.* 2009;21:76-8.
2. Romano G, Moretti G, Di Benedetto A, Giofrè C, Di Cesare E, Russo G, et al. Skin lesions in diabetes mellitus: prevalence and clinical correlations. *Diabetes Res Clin Pract.* 1998;39(2):101-6.
3. Bashier AH, Kordofani YM. Clinicoepidemiological study of cutaneous manifestations of diabetes mellitus in Sudanese patients. *Sud J Dermatol.* 2004;2:54-60.
4. Baloch GH, Memon NM, Ram B, Iqbal P, Thebo NK. Cutaneous manifestation of type II diabetes mellitus. *J Liaquat Uni Med Health Sci.* 2008;7:67-70.
5. Bhat YJ, Gupta V, Kudyar RP. Cutaneous manifestations of diabetes mellitus. *Int J Diab Dev Ctries.* 2006;26:152-5.
6. Raganatha S, Anitha B, Inamadar AC, Palit A, Devarmani SS. Cutaneous disorders in 500 diabetic patients attending diabetic clinic. *Indian J Dermatol.* 2011;56(2):160-4.
7. Mahajan S, Koranne RV, Sharma SK. Cutaneous manifestation of diabetes mellitus. *Indian J Dermatol Venereol Leprol.* 2003;69(2):105-8.
8. Timshina DK, Thappa DM, Agrawal A. A clinical study of dermatoses in diabetes to establish its markers. *Indian J Dermatol.* 2012;57(1):20-5.
9. Sawatkar GU, Kanwar AJ, Dogra S, Bhadada SK, Daval D. Spectrum of cutaneous manifestations of type 1 diabetes mellitus in 500 South Asian patients. *Br J Dermatol.* 2014;171(6):1402-6.
10. Yosipovitch G, Hodak E, Vardi P, Shraga I, Karp M, Sprecher E, et al. The prevalence of cutaneous manifestations in IDDM patients and their association with diabetes risk factors and microvascular complications. *Diabetes Care.* 1998;21(4):506-9.

**Cite this article as:** Antony A. A clinical study of skin manifestations in diabetes at a tertiary hospital in Kerala. *Int J Res Dermatol* 2022;8:31-4.