

ORIGINAL RESEARCH

To conduct a clinical investigation on the dermatological symptoms associated with diabetes

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ABSTRACT

Aim: To conduct a clinical investigation on the dermatological symptoms associated with diabetes. **Material and methods:** The study was a tertiary hospital based cross sectional study. 130 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. Confirmed cases of diabetes with skin lesions of all ages and both sexes were included in the study. 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. **Results:** Out of 130 patients, 100 were having cutaneous infections. Of these, 68 (68%) were having fungal infections and 26 (26%) bacterial, with 6(6%) found to have skin lesions of viral origin of 100 patients, 26 were found to have bacterial infections with furuncles in 9(34.62%) and folliculitis in 5(19.23%). Out of 100 cases studied, 68 were having fungal infections. Among them, 43 (63.24%) were having dermatophytosis followed by candidiasis in 25% of the patients. Out of total 17 cases of candidial infections, the most common was intertrigo in 35.29% of the cases followed by balanoposthitis in 29.42% of the cases. Only one patient was found to have oral candidiasis. Out of 43 cases of diabetes with dermatophytoses, T. cruris was the most common, seen in 55.81% of the patients followed by T. corporis in 25.58% cases. Out of 6 patients with viral infection, 4 were having verruca vulgaris and 2 were found to have Herpes zoster. 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. **Conclusion:** Bacterial skin infections and dermatophytosis are the predominant dermatological lesions seen in individuals with diabetes. The occurrence of these skin conditions is closely related to the length of time a person has had diabetes, and the likelihood of experiencing them is much lower in people who have well-managed blood sugar levels.

Keywords: Dermatological symptoms, Diabetes, Blood sugar

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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.¹ 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.² 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.³ 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.⁴ 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.⁵ 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.

MATERIAL AND METHODS

The study was a tertiary hospital based cross sectional study. 130 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. Confirmed cases of diabetes with skin lesions of all ages and both sexes were included in the study. Diabetics without skin lesions; patients unwilling to participate in the study were excluded 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 130 patients, 100 were having cutaneous infections. Of these, 68 (68%) were having fungal infections and 26 (26%) bacterial, with 6(6%) 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=100	%
Fungal	68	68
Bacterial	26	26
Viral	6	6
Total	100	100

Of 100 patients, 26 were found to have bacterial infections with furuncles in 9(34.62%) and folliculitis in 5(19.23%) (Table 2).

Type of bacterial infections	Number=26	%
Furuncles	9	34.62
Folliculitis	5	19.23
Cellulitis	4	15.39
Nail infections	3	11.53
Impetigo	2	7.69
Carbuncle	1	3.85
Erythrasma	2	7.69
Total	26	100

Out of 100 cases studied, 68 were having fungal infections. Among them, 43 (63.24%) were having dermatophytosis followed by candidiasis in 25% of the patients (Table 3).

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

Type of fungal infections	Number=68	%
Dermatophytosis	43	63.24
Candidiasis	17	25
Pityriasis versicolor	8	11.76
Total	68	100

Out of total 17 cases of candidial infections, the most common was intertrigo in 35.29% of the cases followed by balanoposthitis in 29.42% of the cases. Only one patient was found to have oral candidiasis (Table 4). Out of 43 cases of diabetes with dermatophytoses, *T. cruris* was the most common,

seen in 55.81% of the patients followed by *T. corporis* in 25.58% cases (Table 5). Out of 6 patients with viral infection, 4 were having verruca vulgaris and 2 were 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 were having skin tags (Table 7). acanthosis nigricans (21.9%). 17 (20.7%) of the cases

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

Type of candidial infections	Number=17	%
Intertrigo	6	35.29
Balanoposthitis	5	29.42
Paronychia	3	17.65
Vulvovaginitis	2	11.76
Oral candidiasis	1	5.88
Total	17	100

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

Type of dermatophytic infections	Number=43	%
Tinea cruris	24	55.81
Tinea corporis	11	25.58
Tinea pedis	5	11.63
Tinea manuum	3	6.98
Total	43	100

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

Type of viral infections	Number	%
Verruca vulgaris	4	66.67
Herpes zoster	2	33.33
Total	6	100

Table 7: Dermatoses strongly associated with diabetes mellitus.

Type of dermatoses	Number	%
Pruritus	37	37
Acanthosis nigricans	22	22
Skin tags (acrochordons)	21	21
Cherry angiomas	11	11
Psoriasis	4	4
Lichen planus	1	1
Vitiligo	1	1
Terry nails	1	1
Pigmented purpuric dermatoses	1	1
Beau's lines	1	1
Total	100	100

DISCUSSION

Out of 130 cases studied, 100 were having cutaneous infections. Of these, 68 (68%) were having fungal infections followed by 26 (26%) with bacterial infections and only 6(6%) were found to have viral skin infections. Of the 68 patients with fungal infections, 63.24% were having dermatophytosis and 25% candidiasis. The 26 patients with bacterial infections were mostly afflicted with furuncles or folliculitis. Out of 6 patients with viral infections, 4 were having verruca vulgaris and 2 was found to have herpes zoster. Out of the 43 diabetics with dermatophytosis, T. cruris was the most common in 55.81% of the cases followed by T. corporis in 25.58% of the cases. 5 patients were found to have T. pedis and 3 patients were found to have T. manuum respectively. Out of 100 patients in whom we suspected dermatoses strongly associated with diabetes, the most common condition was pruritus in

37% of the cases followed by Acanthosis nigricans in 22% of the cases. 21(21%) of the cases were having skin tags. Ragunatha et al noted that fungal infections of the skin were more common than bacterial.⁶ 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.⁷ 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.⁸ 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.⁹ 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.¹⁰ 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. In this study, the sample size is 100 which is less when considering the prevalence of diabetes. 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.

with diabetes risk factors and microvascular complications. *Diabetes Care*. 1998;21(4):506-9.

CONCLUSION

Bacterial skin infections and dermatophytosis are the predominant dermatological lesions seen in individuals with diabetes. The occurrence of these skin conditions is closely related to the length of time a person has had diabetes, and the likelihood of experiencing them is much lower in people who have well-managed blood sugar levels.

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