

Original Article

SKIN MANIFESTATIONS AMONGST DIABETIC PATIENTS ADMITTED IN A GENERAL MEDICAL WARD FOR VARIOUS OTHER MEDICAL PROBLEMS

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ABSTRACT:

Objectives: To calculate prevalence of incidental skin manifestations in patients with diabetes mellitus admitted for treatment of various other medical problems in a general medical ward of a teaching hospital, Lahore, Pakistan.

Design: Cross-sectional study.

Setting: Hospital based study on admitted patients in a medical ward, Mayo Hospital, Lahore.

Subjects: One hundred consecutive adult diabetic patients of any age and either sex admitted for various other diseases/problems.

Main Outcome Measures: Skin manifestations.

Results: Out of 100 patients, 60% were males, and 40% females. Skin manifestations were seen in 90% of patients. Diabetic neuropathy was seen in 65.6%, cutaneous infections in 62.2%, pruritus in 46.7%, Diabetic dermopathy in 33.3%, skin tags in 21.1%, acanthosis nigricans in 16.7%, eruptive xanthomas in 8.9%, vitiligo in 6.7%, diabetic bullae in 5.6%, diabetic rubeosis in 5.6%, lichen planus in 4.4%, erysipelas like erythema in 4.4 %, trophic ulcers in (3.3 %), wet gangrene foot in 2.2% and necrobiosis lipodica, granuloma annulare and reacting perforating collagenosis in 1.1 % each.

Conclusions: There are many skin manifestations amongst diabetics who are also suffering from various other medical problems. Patients in routine do not give much importance to these lesions because they appear harmless to them. They do not seek advice of physician/surgeon/dermatologist unless they develop serious skin and soft tissue infections like carbuncles, trophic ulcers or gangrene.

KEY WORDS: Diabetes mellitus, Skin manifestations.

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INTRODUCTION

Diabetes mellitus is a clinical syndrome characterized by hyperglycaemia due to absolute or relative deficiency of insulin. Long standing diabetes can lead to permanent and irreversible functional changes in cells of body and thus lead to various complications. The skin is the largest organ of the body. It is readily available for inspection and scientific study in case of every disease. It is particularly important in diabetics because it essentially does get involved in one way or the other. Dysregulation of glucose, insulin and lipids leads directly to physical signs in skin of patients with diabetes mellitus. Chronically elevated blood glucose leads to non-enzymatic glycosylation (NEG) of

cutaneous proteins, which eventually leads to irreversible advanced glycosylation end products (AGEs)¹.

Universally it is known that cutaneous infections, which may be bacterial, fungal or viral, are common amongst diabetics. Skin and soft tissue is the most common site for bacterial infections and has been reported in upto 30% of diabetics^{2,3}. *Candida albicans* can cause angular cheilitis, vulvovaginitis, balanitis, finger web space infection and paronychia in poorly controlled diabetics⁴. *Necrobiosis lipoidica* (NL) is an asymptomatic disease with oval sharply margined reddish brown plaques occurring mostly over anterior legs. It may also manifest as solitary nodules on the hands, fingers, forearms, face and scalp⁵.

PATIENTS AND METHODS

This study was carried out on diabetic patients admitted in West Medical Ward of Mayo Hospital, which is the biggest teaching hospital attached with King Edward Medical College, Lahore. One hundred consecutive patients, both male and female, admitted in the ward with diabetes mellitus with various medical problems, between the period of

Table-I: Demographic Data

Total No. of Patients	: 100	M : F 3 : 2
No. of patients having cutaneous manifestations :	90 (90%)	
Age of patients:	Mean = 59.1 ± 20.8 Years range 22 to 90 Years	
Type of DM:	IDDM : 01	NIDDM : 99
Duration of DM :	≤ 10 Yrs : 55	≥ 10 Yrs : 45
Status of DM :	Controlled : 47	Uncontrolled : 53
Status of the treatment of DM:	No treatment : 10	On Insulin : 10
	On oral hypoglycemics : 75	On combination therapy : 05

1st July 2001 to 30th October 2001, were included. These patients were diagnosed as diabetics and were on treatment. Blood sugar level above 180 mg % (Fasting) was taken as uncontrolled diabetic. Various parameters were studied in these diabetics and recorded in a preformed proforma. Age, sex, duration of diabetes, control of diabetes, mode of treatment whether on oral or parenteral hypoglycemic agents, cause of admission and skin manifestations were noted. Thorough clinical examination was carried out. All the skin manifestations amongst these patients were noted by both undergraduate and postgraduate research students, which were later checked by a consultant. Those diabetic patients who had a very short stay in the ward (less than 24 hours) were not included in the study. In the end all the data was processed on SPSS 4.

RESULTS

One hundred consecutive admitted diabetic patients alongwith various concomitant diseases were included. Demographic data is given in (Table I). Table II shows that all these patients were primarily admitted for various

Table-II: Medical disorders at the time of admission
(n = 100)

S.No.	Diagnosis	Total	M	F
1.	Ischemic heart disease	28	21	7
2.	Congestive cardiac failure	10	4	6
3.	Cerebrovascular accident	15	6	9
4.	Diabetes mellitus for control prior to surgical procedures.	6	0	6
5.	Pneumonia	4	4	0
6.	Chronic obstructive pulmonary disease	2	2	0
7.	Chronic liver disease	10	7	3
8.	Septicemia.	6	4	2
9.	Hypertension	1	0	1
10.	Tuberculosis	2	1	1
11.	Meningitis	4	2	2
12.	Acute renal failure	1	0	1
13.	Chronic renal failure	8	8	0
14.	Atrial fibrillation	1	0	1
15.	Acute Hepatitis	1	0	1
16.	Urinary tract infection	1	1	0

other ailments in the ward, 63 patients (63%) had either ischemic heart disease, CVA, congestive heart failure or chronic liver disease. It is worth mentioning that six uncontrolled diabetics were only admitted for control of hyperglycaemia because they had to undergo various type of surgical procedures. Ninety of these diabetics (90%) had various cutaneous manifestations as enlisted in (Table III).

The most frequent finding was diabetic neuropathy. It was noted in 59 (65.6%) patients, who had paraesthesias in the form of tingling, burning and numbness. It was relatively more common amongst males (78%). Peripheral pulses were palpable in all the patients. Next common were cutaneous infections and were noted in 56 (62.2%) cases. Many patients had combination of more than one type of infec-

Table-III: Skin manifestations of patients with medical disorders and diabetes mellitus
(n=90)

	Total	Male	Female	Upto 10 yrs	> 10 yrs
<u>Cutaneous manifestations</u>	90	54	36	45	45
1. Erysipelas-like erythemas	04	03	01	00	04
2. Cutaneous infections	56	34	22	27	29
a. Bacterial	23	15	08	10	13
b. Fungal	39	22	17	15	24
c. Viral	10	05	05	08	02
3. Wet gangrene	02	00	02	02	00
Feet	02	00	02	02	00
4. Diabetic rubeosis	05	05	00	02	03
5. Diabetic dermopathy	32	23	09	13	19
6. Diabetic neuropathy	59	46	13	18	41
7. Pruritus	42	30	12	18	24
a. Generalized pruritus	19	14	05	09	10
b. Localized pruritus	23	16	07	09	14
8. Trophic ulcer	03	03	00	02	01
9. Acanthosis nigricans	15	13	02	10	05
10. Necrobiosis lipoidica diabetorum	01	01	00	00	01
11. Granuloma annulare	01	01	00	01	00
12. Diabetic bullae	05	04	01	03	02
13. Vitiligo	06	06	00	03	03
14. Lichen planus	04	04	00	01	03
15. Eruptive xanthomas	08	07	01	06	02
16. Skin tags	19	13	06	07	12
17. Reactive perforating collagenosis	01	01	00	00	01

tion. Out of these 56 patients, 23 (41%) had bacterial infections like furunculosis, cellulitis and carbuncles. 12 out of 56 had fungal infections including tinea corporis, tinea cruris, tinea pedis, tinea versicolor and onychomycosis. Twenty seven out of 56 (48.2%) had candidal infection which was mainly noted in oral cavity and the on tongue. Vulvovaginitis was noted amongst seven female patients.

Pruritus was noted in 42 (46.7%) patients and was both localized and generalized. Generalised and localized pruritus were almost of equal frequency which could be due to many reasons. Localised pruritus was noted on hands, forearms, shins and feet. Diabetic dermopathy were seen in 30/90 (33.3%), skin tags in 19/90 (21.1%), acanthosis nigricans in 15/90 (16.7%), eruptive xanthomas in 8/90 (8.9%), vitiligo in 6/90 (6.7%), diabetic bullae in 5/90 (5.6%), diabetic rubeosis in 5/90 (5.6%), lichen planus in 4/90 (4.4%) and wet gangrene of feet in 2/90 (2.2%) patients. Necrobiosis lipoidica diabetorum, granuloma annulare and reactive perforating collagenosis were noted in one patient each. In majority of patients more than one manifestation was noted. Diabetic dermopathy and neuropathy, pruritus, infections and skin tags were more common in patients with diabetes of more than 10 years duration.

DISCUSSION

Diabetes mellitus is a disease with multiple complications. Minor skin manifestations are not given any importance by the patient. They seek the advice of a doctor only if there is any major skin and soft tissue problems which does not heal with ordinary medications. There are various studies carried out by dermatologists, whereas this study was carried out on diabetic patients who were primarily admitted for various other medical problems. In our study 90% of patients had some kind of skin manifestation whereas it has been reported in the range from 30% to 100% in other studies⁶⁻⁹.

Diabetic neuropathy was the commonest finding (65.5%) in this study as compared to

another study which noted the prevalence of 45%⁹. Cutaneous infections were next common and were present in 62.2% as compared to another study which noted 96%¹⁰. Skin infections like furunculosis, cellulitis and carbuncles were the most common. There is a growing evidence that nerves and neuropeptides may be important for normal immune function¹¹ as well as for normal tissue repair^{12,13}. Ulcers are more common on the feet and lower legs with multifactorial aetiology, like venous insufficiency, chronic lymphedema, stasis eczema, arterial insufficiency, minor trauma and infection¹⁴. Vulvovaginitis was a common finding amongst females which presented as vaginal discharge whereas oral candidiasis was mostly noted on tongue and buccal cavity. Pityriasis versicolor and nail infections were more common amongst male patients. There was no case of deep mycosis. Sensory neuropathy is a factor associated with ulcers, likewise autonomic neuropathy occurs in 20-40% diabetics and this is one of the reasons for pressure point foot ulcers. It undoubtedly relates in part to unperceived trauma such as blisters and ingrown toe-nails, but it may also relate in part to diminished influences of neuropeptides on skin immunity and tissue repair¹⁵, hence they are more prone to infections and also relatively resistant to treatment¹⁰.

Pruritus was noted in 46.7% which was both of generalized and localized type. Localised pruritus was mostly on exposed parts like hands, fingers forearms, dorsal surface of feet and shins. Patients presumed that this is heat generated by the drugs but it was noted that chronic renal failure, chronic liver disease, skin infections, dryness of skin and abnormal sweating was the underlying cause and it has also been reported in another study⁹. Localized pruritus was more common in acral parts of the body and shins which could be because of neurodermatitis, dermopathy or xerosis. Kantor and Nelly¹⁶ do not agree that generalized pruritus is present amongst diabetics. Pruritus over scalp and anogenital region was more commonly noted in females which was not in accordance with other studies^{7,9}.

Diabetic dermopathy is usually asymptomatic¹⁶ and persists irrespective of diabetic control. Diabetic dermopathy is generally described as atrophic circumscribed lesions localized to lower extremities, commonly known as shin spots^{8,17}. Similarly, there is abrupt onset of non-traumatic bullae on the extremities. They heal without scarring in 2-5 weeks time, unless secondarily infected¹⁸.

In this study, relative stiffness of fingers and small joints were noted in 50% of the patients, all these patients had diabetes of more than ten years duration. AGEs have been proposed as the mechanism for clinical phenomena such as scleroderma like changes and limited joint mobility¹⁹. Skin is usually thicker in diabetics²⁰. Collier et al²¹ used ultrasound measurements to show that skin was thicker than non-diabetic controls and this is similar in results with another study from Pakistan⁹. Presence of atrophic shin spots ascertained from Outpatient skin clinics ranges from 24-65% in males and 4-39% in females¹⁴. It is generally agreed that it is more common amongst males and trauma is thought to be the most important cause. These lesions are usually asymptomatic.

There is an association between multiple skin tags and diabetes mellitus and according to one study, two thirds of diabetic patients had skin tags²². In our study 19/90 (21.1%) patients had skin tags which reveals the importance of evaluation of diabetes mellitus in patients having multiple skin tags.

Acanthosis nigricans is a skin disorder the most common cutaneous marker for hyperinsulinemia and insulin resistance²³ which appears as black or grey brown velvety discolouration and is most commonly observed on back, sides of neck, axillae, anogenital region and other skin folds. Acanthosis nigricans (AN) was noted in 16.7% and this is a marker of hyperinsulinaemia²³ and insulin resistance²³. These findings are similar with the study carried out by Huntley et al⁶ but not with the local study⁹ which reported an incidence of 2%. The incidence of eruptive xanthomas varies, in this study it was 8.88% which is not in accordance with another study⁹

which reports 3 % of incidence. Xanthelasmas are associated either with hypercholesterolaemia or with lipid abnormalities because lipids are phagocytosed by macrophages and they appear as foam cells in eruptive xanthomas²⁴. Necrobiosis lipoidica and granuloma annulare were noted in one patient each which is much less as reported by studies carried out at diabetic clinics^{8,9}. Lipodystrophy and lipohypertrophy occur on areas where multiple insulin injections are injected daily for many years²⁵. Similarly we could not note skin changes due to insulin injections^{8,15,26} like lipodystrophy and hypertrophy as it manifests after longer duration of injections at the same site. In our society it is an observation that patients tend to avoid insulin injections and try to control diabetes mellitus with oral drugs despite complications.

CONCLUSION

There are many skin manifestations amongst diabetics who are also suffering from various medical problems and patients in routine do not give them much importance. They do not seek advice of physician/surgeon/dermatologist unless they develop serious skin and soft tissue infections like carbuncles, trophic ulcers or gangrene

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