

A study of pattern of cutaneous manifestations in patients with diabetes mellitus

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Abstract

Background Diabetes is a common endocrine disease which can present with different cutaneous manifestations. Skin can act as a mirror for various systemic diseases including diabetes. For example candidial balanitis & recurrent folliculitis can help in diagnosing diabetes. Autoimmune skin diseases like vitiligo & Alopecia areata are mostly associated with type 1 diabetes. Various skin manifestation can appear in diabetes due to the disease or due to antidiabetic drugs. Thus keeping this in view we have undertaken this study.

Objective To study the pattern of various cutaneous manifestations in diabetic patients and to study their clinical correlation.

Subjects and Methods A cross sectional observational study was performed on 251 patients (159males and 92 females) attending the dermatology outpatient department. A detailed dermatological examination was done and findings were recorded.

Results Fungal infections were most common infections associated with diabetes and in non infectious condition skin tags and acanthosis nigricans were most common.

Conclusion We conclude that fungal infections, skin tags and acanthosis nigricans are most commonly associated with diabetes.

Key words

Diabetes, Fungal infections.

Introduction

Diabetes is the most common endocrine disorder, affecting 9.3% of the world population.¹

1/3rd of patients with diabetes mellitus are estimated to have cutaneous changes.² Diabetes Mellitus (DM) is a clinical syndrome of abnormal carbohydrate metabolism characterized by hyperglycemia resulting from

defects in insulin secretion, insulin action or both.³ It is broadly classified into type 1 and type 2 diabetes. Long-standing diabetes can lead to permanent and irreversible functional changes and damage to cells of the body, thereby leading to various complications, which mainly result from biochemical, structural and functional abnormalities. Cutaneous manifestations have been found in 43 to 66 % of Indian diabetics.⁴

Cutaneous manifestations generally appear subsequent to the development of diabetes but may be the first presenting sign, or even precede the diagnosis by many years; the dermatologist may be the first physician to detect hidden diabetes in a patient.⁵

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Patients and Methods

This present study entitled “A study of pattern of cutaneous manifestations in patients of diabetes mellitus”- was carried out in the department of Dermatology, Venereology and Leprosy at AVBRH, JNMC Sawangi (Meghe), Wardha from August 2016 to August 2018.

The ethical clearance was taken from Institutional Ethics committee.

Study plan Cross sectional observational study

Inclusion Criteria

- Patients of both genders.
 - Patients between 14 to 80 years age group.
 - Patients willing to participate in the study.
 - Patients fulfilling American Diabetes Association criteria for diabetes
1. A1C \geq 6.5%. The test should be performed in a laboratory using a method that is NGSP certified and standardized to the DCCT assay.
OR
 2. FPG \geq 126 mg/dl (7.0 mmol/l). Fasting is defined as no caloric intake for at least 8 h.
OR
 3. 2-h plasma glucose \geq 200 mg/dl (11.1 mmol/l) during an OGTT. The test should be performed as described by the World Health Organization, using a glucose load containing the equivalent of 75 g anhydrous glucose dissolved in water.
OR
 4. In a patient with classic symptoms of hyperglycemia or hyperglycemic crisis, a random plasma glucose \geq 200 mg/dl (11.1 mmol/l).

Exclusion criteria

Patients having skin changes secondary to pregnancy, other systemic illnesses and iatrogenic factors were excluded.

Methodology

Patients who were attending Dermatology, Venereology and Leprosy Outpatient Department of AVBRH, JNMC, Sawangi, Wardha, were enrolled after considering various inclusion and exclusion criteria during the period from August 2016 to August 2018.

A detailed history was taken. After a detailed general, systemic and cutaneous examination, the clinical diagnosis of dermatological findings was established. Their fasting, random blood sugar was assessed for glycemic control. Other relevant laboratory investigations were done wherever required. KOH was done in all fungal patients and only KOH positive patients were enrolled.

Statistical analysis

Data was compiled, tabulated and analysed by SPSS (Statistical package for social sciences) version 22.0. Chi-square test will be used to determine association of various skin lesions with glycaemic control and gender. P value < 0.05 is considered as significant.

Table 1 depicts that 222(88.45%) had duration of < 5years followed by 22(8.76%) duration 6 to 10 years, 3(1.20%) duration 11-15 years, 3(1.20%) duration 16–20 years, 1(0.40%) duration >20 years.

The maximum number of patients i.e. 222 (88.45%) had duration of <5 years.

Table 2 depicts the distribution of patients according to cutaneous infections.

Table 1 Distribution of patients according to duration of diabetes

<i>Duration of diabetes</i>	<i>No of patients</i>	<i>Percentage (%)</i>
≤5 years	222	88.45
6 to 10 years	22	8.76
11 to 15 years	3	1.20
16 to 20 years	3	1.20
>20 years	1	0.40
Total	251	100
Mean ± SD	3.19±3.22(8 mth-25 years)	

Table 2 Cutaneous infections among the study population

<i>Cutaneous manifestations</i>	<i>No. of patients</i>	<i>Percentage (%)</i>
Fungal	133	52.99%
Bacterial	25	9.96%
Viral	2	0.80%
Total	160	63.75%

Table 3 Distribution of patients according to non-infectious cutaneous manifestations

<i>Noninfectious Condition</i>	<i>No of patients</i>	<i>Percentage (%)</i>
Skin Tag	65	25.9%
Acanthosis Nigricans	27	10.76%
Diabetic Foot	14	5.58%
Xerosis	12	4.78%
Vitiligo	7	2.79%
Acne Keloidalis Nuchae	5	1.99%
Pruritus	5	1.99%
Xanthlasma Palpebram	5	1.99%
Non Healing Ulcer	3	1.2%
Lichen Planus	3	1.2%
Pemphigus Vulgaris	2	0.8%
Psoriasis	2	0.8%
Diabetic Bullae	1	0.4%
Diabetic Thick Skin	1	0.4%
Granuloma Annulare	1	0.4%
Total	153	58.99%

Maximum number of patients i.e. 133(52.99%) fungal, 25(9.96%) bacterial and 2(0.80%) viral.

Table 3 depicts the distribution of patients according to non-infectious conditions, In non-infectious conditions the most number of patients i.e. 65(25.9%) Skin tag, 27(10.76%) acanthosis nigricans, 14(5.58%) Diabetic foot, 12(4.78%) xerosis, 7(2.79%) vitiligo,

Table 4 Distribution of patients with infectious cutaneous manifestations in diabetes

<i>Infections</i>	<i>Diagnosis</i>	<i>No of patients</i>	<i>%</i>
Bacterial	Cellulitis	11	4.38
	Folliculitis	3	1.2
	Pyoderma	3	1.2
	Ecthyma	2	0.8
	Furuncle	2	0.8
	Intertrigo	2	0.8
	Carbuncle	1	0.4
	Erythrasma	1	0.4
	Total	25	9.96
	Tinea corporis	65	25.9
	Tinea cruris	38	15.14
	Candial balanitis	9	3.59
	Fungal	Vaginal candidiasis	6
Oral candidiasis		4	1.59
P.versicolor		3	1.2
Intertrigo		2	0.8
Tinea pedis		2	0.8
Tinea faciei		2	0.8
Candidial balanoposthitis		1	0.4
Candidial intertrigo		1	0.4
Total		133	52.99
Viral		Herpes zoster	2
	Total	2	0.80
Overall Total		160	63.75

5(1.99%) acne keloidalis nuchae, xanthlasma palpebram and pruritus, 3(1.2%) non healing ulcers and lichen planus, 2(0.8%), psoriasis and pemphigus vulgaris, 1(0.4%) diabetic bullae, diabetic thick skin & granuloma annulare.

Table 4 depicts distribution of infectious conditions in diabetes in which highest number is 65(25.9%) tinea corporis followed by 38(15.14%) tinea cruris, 11(4.38%) Cellulitis, 9(3.59%) candidial balanitis, 6(2.39%) vaginal candidiasis, 4(1.59%) oral candidiasis, 3(1.2%) folliculitis, p. versicolor and pyoderma, 2(0.8%) Ecthyma, furuncle, herpes zoster, intertrigo and 1(0.4%) carbuncle, candidial balanoposthitis, erythrasma and candidial intertrigo. Maximum number of cases i.e. 65(25.9%) had tinea corporis.

Table 5 Distribution of patients according to FBS Level

FBS (Mg%)	No of patients	Percentage (%)
Normal(70-110)	28	11.16
Abnormal(>110)	223	88.84
Total	251	100.00
Mean FBS ±SD	180.96 ± 73.40(72-482)	

Table 6 Distribution of patients according to PMBS

PMBS(Mg%)	No of patients	Percentage (%)
Hypoglycemic(<120)	3	1.20
Normal(120-140)	3	1.20
Abnormal(>140)	245	97.61
Total	251	100
Mean PMBS±SD	260.04±86.50(92-576)	

Table 5 depicts the distribution of patients according to FBS i.e. most number of patients had FBS >110 223(88.14%) followed by Normal (70-110)28 (11.16%). Mean FBS ±SD was 180.96±73.40(72-482).

Table 6 depicts the distribution of patients according to PMBS i.e. Highest number of patients had PMBS abnormal, 245 (97.61%) followed by Hypoglycemic, 3(1.20%) and normal 3(1.20%). Mean PMBS±SD was 260.04±86.50(92-576).

Discussion

Table 1 depicts that maximum number of patients i.e. 222(88.45%) had duration of <5years and least number of patient i.e. 1(0.40%) duration was >20 years.

Similarly, Nandini Chatterjee *et al*⁷. reported that maximum number of patients i.e. 290 had diabetes for 1-10 years followed by 201<10 years & 12 patients were newly diagnosed cases of diabetes. So the maximum patients i.e. 290 had diabetes from 1-10 years.

The relevance for knowing the duration of diabetes was explained by Hattem *et al*. That patients who have had Diabetes for extended

years tend to develop more catastrophic cutaneous problems .On the other hand problems can develop in the short-range, as insulin and oral hypoglycemic drugs can have cutaneous side effects.

Table 2 depicts the distribution of patients according to skin infection. Maximum number of patients i.e. 133(52.99%) fungal, 25(9.96%) bacterial and 2(0.80%) viral.

Yoganand J. Phulari *et al*⁸ reported that skin manifestations among the study population, where 61% had infectious skin manifestations and 39% had non infectious.

Nawaf Al-Mutairi *et al*⁹ in their study on cutaneous manifestations of diabetes in 106 patients. Of the 106 patients, 69 had only 1 cutaneous manifestation, 27 had 2, 6 had 3 and 4 had 4. Infections (68.0%) were the major cutaneous manifestations with fungal infection occurring in 41 patients followed by Bacterial infection in 27. The data showed that infections were the most common cutaneous manifestation.

Galdeano *et al*¹⁰ evaluated 125 patients with type 1 and 2 DM in a single center in Argentina. The study showed a high prevalence of skin disorders: 90.4 %. Skin manifestations occurring in more than 10 % of the dermatophytosis (52 %), onychomycosis. (49 %), tinea pedis (39 %).

Study in Brazil conducted in Canoas with 55 patients also demonstrated a high prevalence of cutaneous manifestations among diabetes patients (89.1%), comprising candidiasis (52.7%), dermatophytosis (50.9%), nail dystrophy (45.5%) and staphylococcus infections (38.2%).

Table 3 depicts the distribution of patients according to non-infectious conditions.

In non-infectious conditions the most number of patients i.e. 65(25.9%) had skin tags and least were 2(0.8%) pemphigus vulgaris and psoriasis followed by 1(0.4%) diabetic bullae, diabetic thick skin and granuloma annulare.

Vishwanathan *et al*¹¹. Reported that 71(17.75%) patients had skin tags. Other dermatoses associated with diabetes mellitus noted were acanthosis nigricans (5.5%) of patients diabetic bullae (0.5%), diabetic foot in (3%) of the diabetic.

Srirath Kambil *et al*¹². reported in his study 29(10.13%) acrochordons and 66(23.07%) of patients had acanthosis nigricans.

Muhammad Shahzad *et al*⁶. reported in his study that 131(40.9%) of patients had Skin tags.

Table 4 depicts distribution of infectious conditions in diabetes in which maximum number of patients had fungal infections 133(53%) followed by bacterial 25 (9.98%) and viral2 (0.64%).

Vishwanathan *et al*¹¹. reported that 148 (37%) Diabetics most common infection was fungal infections i.e. 106 (26.5%) patients.

Table 5 depicts the distribution of patients according to PMBS i.e. most number of patients had PMBS (>140) abnormal i.e. 245 (97.6%).

Srirath Kambil *et al*¹² in their study examined 286 patients 172(60.13%) were males and 114(39.86%) females. The cutaneous lesions were more common in patients with unsatisfactory glycaemic control.

Table 6 depicts the distribution of patients according to PMBS i.e. most number of patients had PMBS (>140) abnormal i.e. 245 (97.6%).

Srirath Kambil *et al* (2017)¹² in their study examined 286 patients 172 (60.13%) were males and 114(39.86%) females. The cutaneous lesions were more common in patients with unsatisfactory glycemic control. In the above study also fasting blood sugar level and post meal blood sugar level both were raised.

Conclusion

On the basis of our present study, we state that fungal infections are more common with diabetes and therefore a patient of old age with fungal infection and Skin tags should be ruled out for Diabetes. We conclude that patients of diabetes mellitus with cutaneous manifestations should be managed by both Dermatologist and Physician with proper coordination for better patient outcome.

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