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Prevalence of Skin Findings among Libyan Diabetic Patients.

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Original Research Article

Abstract

Background: Diabetes mellitus (DM) is the most common endocrine disorder. Almost one-third of diabetic patients are affected by cutaneous manifestations during their disease. Cutaneous manifestations of diabetes are caused by either diabetes-induced metabolic changes in the skin or by associated complications like vasculopathy and neuropathy.

Objectives: To estimate the prevalence of skin diseases among patients with diabetes mellitus.

Method: One hundred eighty known adult diabetic patients of either sex attending the outpatient clinic of the diabetic center (Diabetic Center / Benghazi / Libya) for treatment and follow-up of diabetes were randomly selected for the study. Detailed case history of each patient with special attention to cutaneous lesions were taken. A dermatologist performed a detailed dermatological examination.

Results: In this study, most diabetes patients ranged from 41 to 60 years for females, while for males, they were over 60 years. The majority of patients in the current study were females. The most common dermatosis associated with DM was acanthosis nigricans; seen in (69.4%) of patients, skin tag was the second most common dermatosis, accounting for (56.7%) of patients, xerosis was seen in (54.4%), pruritus seen in (37.2%), fungal skin infections found in (25.6%). Diabetic dermopathy was seen in (17.7%), and prayer signs were found in (10.6%). Fifteen (8.3%) diabetic patients had nail changes, and eight (4.4%) diabetic patients had foot ulcers. Diabetic bullae were found in (2.2%); as well as viral infections were seen in (2.2%). Two (1.1%) diabetic patients have bacterial infections.

Conclusion: The prevalence of certain dermatoses was increased among diabetic patients. So, diabetic patients are considered to be at risk of developing certain skin diseases.

Keywords: Diabetes mellitus (DM), Acanthosis nigricans, Skin tag, Xerosis; Pruritus.

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INTRODUCTION

The skin is almost invariably affected by DM; the cutaneous findings of DM are numerous and different studies have reported a different frequency. Most of the patients affected by DM develop skin manifestations eventually (1). Skin findings among patients with DM are attributed to abnormal carbohydrate metabolism, atherosclerosis, microangiopathy, neuron degeneration, impaired host responses, and some other yet undetermined mechanism (2). Various skin disorders associated with diabetes include: acanthosis nigricans, skin tags, diabetic dermopathy, diabetic bullae, diabetic thick skin, yellow skin, eruptive xanthomas, necrobiosis lipoidica, disseminated granuloma annulare, yellow nails, scleredema, diabetic rubeosis, lichen planus and vitiligo (3). Controlling the metabolism of the body may prevent some of these manifestations and also support the treatment (4). Increasing the awareness about skin diseases commonly seen among patients with DM can be associated with a better prognosis of disease through early management (5).

OBJECTIVES

To determine the prevalence of skin diseases among patients with diabetes mellitus.

METHODS

A cross-sectional study was conducted on 180 known adult diabetic patients of either sex attending the outpatient clinic of the diabetic center (Diabetic Center / Benghazi / Libya) for treatment and diabetes follow-up who were randomly selected during the period from January 2022 to March 2022. Non-Libyans, patients with other endocrinal disorders, and pregnant women were excluded from the study group. We also excluded any patients who were not willing to participate. Verbal informed consent was obtained from all participants. Detailed case history of each patient with special attention to cutaneous lesions was taken and dermatologist performed detailed dermatological examination. The data were analyzed by using the statistical package for social sciences program version 18 (SPSS), with a P-value of <0.05 considered statistically significant.

RESULTS

A total of 180 diabetic patients, 43 (23.9%) males and 137 (76.1%) females (Figure 1).

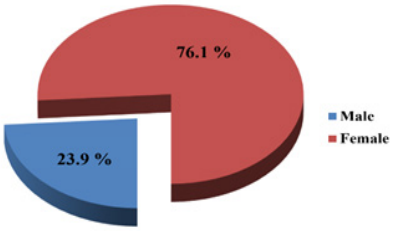


Figure 1. Distribution of patients according to sex.

The most of diabetes patients age group was those over 60 years old followed by 41- 60 years old for males, for females the age group was 41- 60 years followed by those over 60 years old (Table 1).

Table 1. Distribution of patients according to age.

Age group	Female No(%)	Male No(%)	P value
<= 20	1(0.7%)	0(0%)	
40-21	3(2.2%)	2(4,7%)	
60-41	72(52.6%)	16(37.2%)	0.2
=>61	61(44.5%)	25(58.1%)	
Total	137(100%)	43(100%)	

Differences between males and females regarding age groups were not significant (P value = 0.2). The distribution of diabetic patients according to cutaneous findings is shown in Table 2. Acanthosis nigricans was observed in 125 (69.4%) patients; 44% were males and 77.4% were females. The commonest site involved was the neck.

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Table 2. Distribution of diabetic patients according to cutaneous findings.

Cutaneous findings	Female No (%)	Male No (%)	Total No (%)
Acanthosis nigricans	106 (77.4%)	19 (44.2%)	125 (69.4%)
Skin tag	86 (62.8%)	16 (37.2%)	102 (56.7%)
Xerosis	70 (51.1%)	28 (65.1%)	98 (54.4%)
Pruritus	42 (30.7%)	25 (58.1%)	67 (37.2%)
Fungal infections	46 (33.6%)	0 (0%)	46 (25.6%)
Diabetic dermopathy	24 (17.5%)	8 (18.6%)	32 (17.7%)
Prayer sign	18 (13.1%)	1 (2.3%)	19 (10.6%)
Nail changes	8 (5.8%)	7 (16.3%)	15 (8.3%)
Foot ulcer	5 (3.6%)	3 (7%)	8 (4.4%)
Diabetic bullae	3 (2.2%)	1 (2.3%)	4 (2.2%)
Viral infections	4 (2.9%)	0 (0%)	4 (2.2%)
Bacterial infections	0 (0%)	2 (4.7%)	2 (1.1%)

In 80 (52.3%) of cases (Figure 2), the axilla was involved in 60 (39.2%), while the groin was involved in 13 (8.5%). Among 102 (56.7%) patients having skin tags; (37.2%) were males and (62.8%) were females.



Figure 2: Acanthosis nigricans involving the neck.

The neck alone was involved in 50 (49%) (Figure 3), the neck along with the chest was involved in 42 (41.2%), and the axilla was involved in 10 (9.8%). Xerosis was seen in 98 (54.4%) patients; (65.1%) were males and (51.1%) were females.

Hands were involved in 60 (61.2%) patients (Figure 4), and bodies were involved in 38 (38.8%).



Figure 3. Skin tags involving the neck.



Figure 4. Hand xerosis.

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Pruritus was seen in 67 (37.2%); about (58.1%) was observed in males and (30.7%) was seen in females. Forty-six (25.6%) patients had fungal infections all cases were females (33.6%). Tinea pedis affected about 30 (16.7%) patients (Figure 5), 16 (8.9%) patients had candidiasis, 10 (62.5%) had vaginal candidiasis, and 6 (37.5%) had it under the breast.

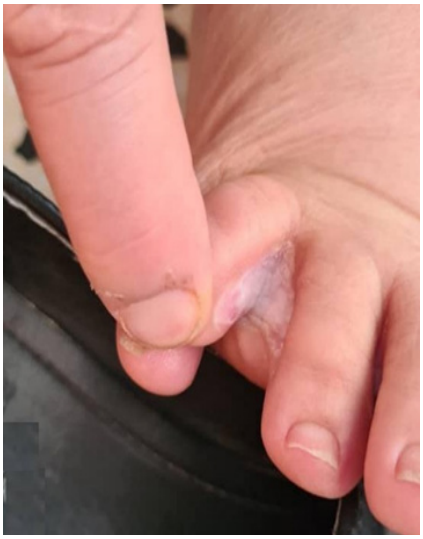


Figure 5: Tinea pedis

Diabetic dermopathy was seen in 32 (17.7%) patients; 18.6% were males and 17.5% were females. Nineteen (10.6%) of diabetic patients had prayer sign; (2.3%) of males and (13.1%) of females (Figure 6).



Figure 6: Prayer sign

Among 15 (8.3%) diabetic patients having nail changes; (16.3%) of males and (5.8%) of females. Ten (66.7%) patients have yellow nails, and 5 (33.3%) patients have thick nails (Figure 7).



Figure 7: Nail changes showing thick nail palate.

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Eight (4.4%) of diabetic patients had foot ulcers (7%) of males and (3.6%) of females. Diabetic bullae seen in 4 (2.2%) patients (2.3%) of males and (2.2%) of females. Among 4 (2.2%) diabetic patients having viral infections, all were females (2.9%). Two (1.1%) patients have planter warts, and 2 (1.1%) patients have herpes zoster. Two (1.1%) patients had bacterial infections all were males (4.7%). One (0.55%) patient had carbuncle (Figure 8), and 1 (0.55%) patient had ecthyma.



Figure 8: Carbuncle on the back.

DISCUSSION

In the current study, most of the diabetes patients age group was 41-60 years for females, while males were those over 60 years old, these observations were consistent with a regional study from El-Beida city (6). The majority of patients enrolled in the present study were females. Skin findings were seen more commonly in females in the current study, as the higher number of females presenting to the OPD indicates greater health awareness among females; this result appears to be similar to the study of Niaz, F, et al. (7). In this study, the most common five skin disorders observed associated with diabetes are: acanthosis nigricans (69.4%), skin tag (56.7%), xerosis (54.4%), pruritus (37.2%), and fungal infections (25.6%), this comes in accordance with studies in Libya (6), Saudi Arabia (8), and Turkey (9). In the present study, the most common dermatosis associated with DM was acanthosis nigricans, seen in (44.2%) of males and (77.4%) of females, followed by skin tags, which accounted for (37.2%) of males and (62.8%) of females. Thappa et al. (10) concluded that skin tags may serve as a marker for diabetes mellitus.

Xerosis was seen in 65.1% of males and 51.1% of females, consistent with a study from El-Beida City (6). The high prevalence of xerosis in our diabetic patients is most likely because most of the patients don't drink an adequate amount of water per day, especially in the winter season, or due to the normal xerotic process of the elderly. Pruritus was also seen in 58.1% of males and 30.7% of females. Pruritus is well known to have an association with diabetes mellitus as reported in the past literature (11, 12). Al-Mutairi et al. who reported pruritus in (47%) of their patients (13); this is nearly similar in frequency when compared to our patients (37.2%). In the present study, 25.6% of the enrolled patients had fungal skin infections; all were females (33.6%). The most common disease was tinea pedis, which was seen in (16.7%) of patients. Tinea pedis can act as a portal of entry for secondary bacterial invasion. Candidiasis, which may be an early indicator of undiagnosed diabetes, was also seen in 8.9% of our patients. Diabetic dermopathy was seen in 17.7% of our patients (18.6% of males and 17.5% of females); this is in contrast to the results obtained by Niaz, F, et al., where diabetic dermopathy frequency was 9% in their patients (7).

In this study, 10.6% of the enrolled patients had prayer sign (2.3% of males and 13.1% of females), which is inconsistent with Ezejiofo ROI, who reported that prayer sign was seen in only 4% of patients (14). Fifteen (8.3%) diabetic patients had nail changes (16.3%) of males and (5.8%) of females, lower than that reported by Niaz, F., et al., where nail changes were seen in (16%) of their patients (7).

In the current study, 8 (4.4%) diabetic patients had

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foot ulcers (7%) of males and (3.6%) of females. It is usually related to different mechanisms like impaired immunity, neuropathy, peripheral arterial disease, venous insufficiency, and lymphedema. It has been reported with a variable frequency in different studies ranging between 10 and 50% (11, 15, 16). Consistent with current study, Niaz, F, et al have reported foot abnormalities were more common in female diabetics (7), while study done by Mansour et al. have reported foot abnormalities were common in male diabetics (17). Diabetic bullae were found in 2.2% of our patients (2.3% of males and 2.2% of females); this is in agreement with the results obtained by Bhat et al. (18). Viral infections were seen in (2.2%) of the patients; all of them were females (2.9%), this is in agreement with other regional studies (6). In this study, 2 (1.1%) diabetic patients had bacterial infections (4.7%); all of them were males. One (0.55%) patient had a carbuncle, and one (0.55%) patient had ecthyma; these findings are in contrast to the frequency of bacterial infections that was reported to be higher by a study from El-Beida city (6).

CONCLUSION

The prevalence of certain dermatoses was high among diabetic patients. So, diabetic patients are considered to be at risk of developing certain skin diseases.

RECOMMENDATION

General practitioners should be aware of the diagnosis and management of skin diseases that are commonly seen among diabetic patients, and difficult cases should be referred to specialists for early management to minimize complications and morbidities associated with diabetes mellitus.

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