

Cutaneous manifestations of diabetes mellitus among patients in Aden

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DOI: <https://doi.org/10.47372/uajnas.2015.n2.a12>

Abstract

This retrospective study was conducted on diabetic patients with skin lesions attending two private clinics in Aden, during the period January 2013 to December 2014. Two hundred and nine diabetic patients, 123 (58.9%) females and 86 (41.1%) males, enrolled in this study. Their ages ranged from 12 to 88 years, with a mean age 54.7 ± 13.8 years. The majority of patients (91.8%) were with type II DM and 8.2% with type I DM. 50.2% of patients with type II DM were in the age group 41-60 years, while in type I DM patients of age ≤ 40 years represents 5% ($p < 0.05$). The duration of diabetes was ≤ 5 years in 88 (42.1%) patients and 121 (57.9%) had diabetes > 5 years. The majority of patients 90.4% had single type of skin lesions and 9.6% had combination of two types of skin lesions. The various types of skin lesions were: tinea pedis 44 (19.2%), pruritis 22 (9.6%), diabetic dermopathy 19 (8.3%), pyoderma 17 (7.5%), eczema 15 (6.6%) and the last four diseases were xanthoma (1.7%), necrobiosis lipoidica (1.3%), lipid dystrophy (1.3%) and psoriasis vulgaris 2 (0.9%). We concluded that skin involvement occurs quite often in diabetic patients. A need exist to provide information, education and communication to diabetic patients so as to increase their awareness.

Key words: Diabetes mellitus, cutaneous manifestations, private clinics, Aden

Introduction

Diabetes mellitus (DM) is a worldwide problem and the most common endocrine disorder (13). It is a hetero-geneous group of metabolic disorders with multiple etiologies characterized by disturbances in carbohydrate and lipid metabolism as well as continually elevated levels of serum glucose (hyperglycemia). The World Health Organization classification distinguishes 4 types of diabetes based on etiology: type I DM, type II DM, gestational DM, and impaired glucose tolerance (1,11,29,31). Skin lesions are common in patients with DM, and approximately 30% of these patients develop cutaneous manifestations during the course of their illness (5,9,12). Al-Mutairi (2) mentioned that the incidence of cutaneous disorders in diabetic patients varies between 30% and 71%, according to different authors.

Skin manifestations in diabetes mellitus are common and is expressed in numerous forms. If one considers metabolic effects on microcirculation and changes in skin collagen, prevalence approaches 100 percent (26). A broad spectrum of cutaneous disorders may be encountered in both patients with type I and type II DM. Cutaneous diseases can appear as the first sign of diabetes or may be developed at any time in the course of the disease (2).

On occasion, these dermatologic findings may even precede any clinical or biological evidence of DM. Cutaneous manifestations of DM can be classified as skin lesions strongly associated with DM; skin lesions of infectious etiology; dermatologic disorders related to complications of DM; and skin conditions related to the treatment of DM (23,24).

The skin has the potential to provide a window into the patient and aid in the diagnosis of diseases of all organ systems (16). Diabetes mellitus affects every organ system and the skin is no exception. Approximately, one-third of diabetic patients have cutaneous manifestations. In fact, cutaneous findings may be the first indicator of disease and may allow an astute physician to initiate diagnostic testing (17).

Long standing diabetes can lead to permanent and irreversible functional changes in body cells and, thus, lead to various complications (25). The World Health Organization (WHO) estimates the global burden of diabetes to be 299 million cases by the year 2025 (14). The skin is the largest

Cutaneous manifestationsAmer Omer Bin Al-Zou and Asia Hasan Abdullah Saleh 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 gets involved in one way or the other (7).

Objective

To study the pattern of cutaneous manifestations among diabetic patients in two private clinics in Aden.

Materials and methods

This retrospective study was conducted in two private clinics of Dermatology in Aden, two hundred and nine patients with the diagnosis of diabetes mellitus and having skin lesions attending the two private clinics constituted the study population. They were 123 females and 86 males. Variables regarding sex, age, type of DM, treatment, duration of DM and dermatological diagnosis were noted.

The collected data was entered into the computer software program of Excel. The analysis was carried out using SPSS 17, as statistical program and for variables difference, chi-square tests, and P values were calculated, with differences at the 5% level being regarded as significant.

Results

The study comprised 209 patients of diabetes mellitus with skin lesions seen in our private clinics. The male patients were 86 (41.1%) and the females 123 (58.9%) with a ratio of females to males 1.43:1, as shown in Figure 1.

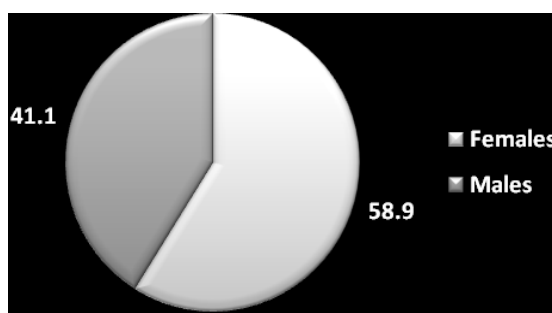


Figure 1: Distribution of study patients related to sex

The age of the patients ranged from 12 to 88 years, with a mean age 54.7 ± 13.8 years. Table 1 shows that 109 (52.1%) of patients were 41-60 years of age, 71 (34%) were more than 60 years and only 29(13.9%) were ≤ 40 years. Female and male patients of the age 41-60 years are predominant, with 64 (30.6%) and 45 (21.5%) respectively, ($p > 0.05$).

Table 1: Distribution of study patients, related to sex and age group (n=209)

Age group (years)	Sex		Total
	F	M	
≤ 40	21 (10.1%)	8 (3.8%)	29(13.9%)
41-60	64 (30.6%)	45 (21.5%)	109 (52.1%)
> 60	38 (18.2%)	33 (15.8%)	71 (34%)
Total	123 (58.9%)	86 (41.1%)	209 (100%)

Chi-square =3.037; p = 0.219

The majority of patients 192 (91.8%) were affected with type II DM and only 17 (8.2%) were affected with type I DM. 50.2% of patients with type II DM were in the age group 41-60 years,

Cutaneous manifestationsAmer Omer Bin Al-Zou and Asia Hasan Abdullah Saleh while in type I DM patients of age ≤ 40 years represented higher percent 5.3%. The difference between values is statistically highly significant ($p < 0.05$), as it appear in Table2.

Table 2: Distribution of DM types according to age groups

Age group (years)	Type of DM		Total
	Type I DM	Type II DM	
≤ 40	11 (5.3%)	18 (8.6%)	29 (13.8%)
41-60	4 (1.9%)	105 (50.2%)	109 (52.2%)
> 60	2 (1%)	69 (33%)	71 (34%)
Total	17 (8.2%)	192 (91.8%)	209 (100%)

Chi-square = 40.051; p-value =0.000

The duration of diabetes was ≤ 5 years in 88 (42.1%) patients and 121 (57.9%) had diabetes > 5 years, as shown in Figure 2.

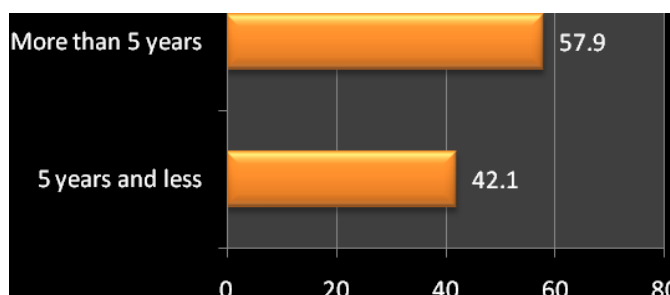


Figure 2: Distribution of study patients related to duration of DM

The majority of patients 189 (90.4%) had a single type of skin lesions and 20 (9.6%) patients had combination of two types of skin lesions, as shown in Figure 3.

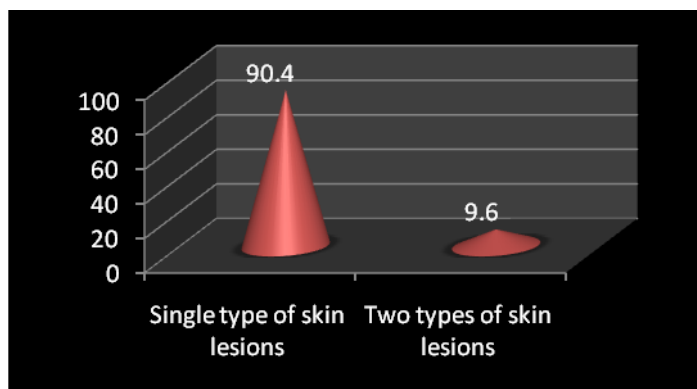


Figure 3: Single and combination types of skin lesions

Table 3 reveals the various types of skin lesions. The highest skin lesions is tineapedis44 (19.2%) followed by pruritis22 (9.6%), diabetic dermopathy 19 (8.3%), pyoderma17 (7.5%), eczema 15 (6.6%) and the last three diseases were xanthoma (1.7%), necrobiosislipoidica (1.3%), lipid dystrophy (1.3%) and psoriasis vulgaris 2 (0.9%).

Table 3: Distribution of skin lesions among study patients

Skin lesion	No	%
Tineapedis	44	19.2
Pruritis	22	9.6
diabetic dermopathy	19	8.3
Pyoderma	17	7.5
Eczema/dermatitis	15	6.6
Warts	14	6.1
Foot ulcer	8	3.5
Acanthosisnigricans	9	3.9
Vitiligo	8	3.5
Herpes zoster	7	3.2
Tineacircinata	8	3.5
Onychomycosis	8	3.5
Pyodermagangrousum	6	2.6
Skin tags	6	2.6
Lichen planus	5	2.2
Tineaversicolor	5	2.2
Bullous diabetecurum	4	1.7
Tineacuris	4	1.7
Paranychia	4	1.7
Pemphigus vulgaris	4	1.7
Xanthoma	4	1.7
Necrobiosislipoidica	3	1.3
Lipid dystrophy	3	1.3
Psoriasis vulgaris	2	0.9
Total	229	100

Discussion

The skin has the potential to provide a window in to the patient and aid in the diagnosis of diseases of all organ systems (16). Diabetes mellitus affects every organ system and the skin is no exception. Approximately, one-third of diabetic patients have cutaneous manifestations. In fact, cutaneous findings may be the first indicator of disease and may allow an astute physician to initiate diagnostic testing (17).

In the present study, the results indicate that skin diseases were more prevalent in women than men. Ahmed et al (1) found the same results and reported that it could be partly due to greater awareness of women of health issues or may be due to under representation of men in our private clinic. Similar findings were reported by others (18,26,27).

The mean age of diabetic patients in this study was 54.7 years, similar to other findings (1,4). The high prevalence of diabetes mellitus in this age mean that majority of diabetics were suffering from the disease in their most productive years of life.

Our study reveals that the frequency of skin disease was more in the age group 40-60 years, as reported by Romano et al (26) and Nigam et al (22).

In the present study patients with type II DM represented higher percentage than type I DM. This finding is similar to that reported by Shahzad et al (28)

In our study, it is found that the majority of patients were with duration of diabetes more than 5 years. This is consistent with a finding reported by Sanad et al (27) from Egypt.

In our study, the most common five skin disorders were: Tineapedis (19.2%), pruritis (9.6%), diabetic dermopathy (8.3%), pyoderma (7.5%) and eczema (6.6%).

Carlo et al (6) reported that diabetes mellitus alone accounts for a significant portion of tinea pedis.

Cutaneous manifestationsAmer Omer Bin Al-Zou and Asia Hasan Abdullah Saleh

Tinea pedis is commonly called “athlete's foot”. It is caused by a fungus that grows predominantly in warm moist environments and causes this infection that usually involves feet and toes. Tinea pedis affects a large number of people, and its prevalence is steadily increasing (15).

The second commonest finding (pruritus) was found in 9.6% of diabetic patients in this study. Other similar previous studies reported the prevalence of pruritus as 1%, 15.1% and 49% (1,3,21).

The third common finding in our study was diabetic dermopathy (8.3%), while different percentages in similar studies were reported by Goyal et al (10) from India 36%, by Ahmed et al (1) from Pakistan, 4.2%, by Foss et al (8) from Brasil, (1.2%) and by Yasso et al (32) from Iraq 3.6%.

Diabetic dermopathy may develop from the factors that lead to the development of vascular complications of diabetes and it may serve as a clinical sign of an increased likelihood of vascular complications in diabetic patients (10). In our study, it is found that pyoderma represented 7.5%. To some extent, our result was similar to that by Foss (8) with (5%). In this study, eczema were reported in a lower percentage of patients (6.6%), compared with 8% and 12.5% of the patients in studies by Romano et al (26) and Foss et al (8), respectively. Some of the less common findings were observed in this study; like warts, foot ulcer, acanthosis nigricans, vitiligo, herpes zoster tinea circinata, onychomycosis, pyoderma gangrenosum, skin tags, lichen planus, tinea versicolor, tinea cruris, paronychia, xanthoma and others as appeared in Table 3. Similar findings were reported in published studies (1,27,32).

Necrobiosis lipoidica diabetorum (NLD) is the best known cutaneous marker of diabetes mellitus although only 0.3% - 1.6% of all patients with DM will have NLD (19,20,33), and our finding 1.3% is relatively in the same range. Lipodystrophy reflecting possibly a localized immune reaction to insulin associated loss of subcutaneous fat. Lipodystrophy is rarely now with the introduction of purified human insulin (2,30) and only 3 cases (1.3%) were found in our study.

Only 2 (0.9%) cases of psoriasis were found in our study. This, to some extent, is similar to that reported by Sanad et al (27).

Conclusion

We concluded that skin involvement occurs quite often in diabetic patients.

A need exists to provide information, education and communication to diabetic patients so as to increase their awareness and, thus, enable early recognition of skin lesions.

References:

1. Ahmed K, Muhammad Z, Qayum I. (2009). Prevalence of cutaneous manifestations of diabetes mellitus. *J Ayub Med Coll Abbottabad*, 21(2): 76-79
2. Al-Mutairi Nawaf. (2006). Skin diseases seen in diabetes mellitus. *Bull Kuwait Inst Med Spec*, 5: 30-39
3. Al-Mutairi N, Zaki A, Sharma AK, Al-Sheltawi M. (2006). Cutaneous manifestations of diabetes mellitus: Study from Farwaniya Hospital, Kuwait. *Med Princ Pract*, 15(6):427-30.
4. Basit A, Hydrie MZI, Hakeem R, Ahmedani MY and Masoo Q. (2004). Frequency of chronic complications of type 2 diabetes. *J Coll Physicians Surg Pak*, 14(2):79-83.
5. Braverman IM. (1971). Cutaneous manifestations of diabetes mellitus. *Med Clin North Am*. 55:1019-1029.
6. Carlo CJ, Mac Williams P, Bowe P. (2007). Tinea pedis (athlete's foot). Available at: <http://www.bhchp.org>.
7. Dogra S, Kumar B. (2003). Epidemiology of fungal infections, a study from Northern India. *Pediatr Dermatol*. 20:470.
8. Foss NT, Polon DP, Takada MH, Foss-Freitas MC, Foss MC. (2005). Skin lesions in diabetic patients. *Rev Saudi Publica*, 39(4):677-82.
9. Gilgor RS, Lazarus GS. (1981). Skin manifestations of diabetes mellitus. In: Rifkin H, Raskin P, eds. *Diabetes Mellitus*. Vol 5. Bowie, MD: Robert J. Brady Company, p:313-321.
10. Goyal A, Raina S, Kaushal SS, Mahajan V, Sharma NL. (2010). Pattern of cutaneous manifestations in diabetes mellitus. *Indian J Dermatol*. 55(1): 39-41.

Cutaneous manifestationsAmer Omer Bin Al-Zou and Asia Hasan Abdullah Saleh

11. Gutteridge IF. (1999). Diabetes mellitus: a brief history, epidemiology, definition and classification. *ClinExpOptom*. 82:102-106.
12. Jelinek JE. (1990) Skin disorders associated with diabetes mellitus. In: Rifkin H, Porte D, eds. Ellenberg and Rifkin's Diabetes Mellitus, Theory and Practice. 2nded. New York, NY: Elsevier;:838-849.
13. Jennifer L, John E (2003): Diabetes mellitus. In: Irvin MF, Arthur Z, Klaus W, Austen KF, Goldsmith LA, Katz SI, editors. *Dermatology in general medicine*, 6th ed. McGraw Hill. Medical publishing Division: New York; p:1651-61.
14. Khatib P, Oussama MN. (2006). Guidelines for the prevention, management and care of diabetes mellitus. EMRO Technical Publications Series; 32:1.
15. Kumar V, Tilak R, Prakash P, Nigam C, Gupta R. (2011).TineaPedis– an Update. *Asian Journal of Medical Sciences*, 2: 134-138
16. Lee A. (2009). Skin manifestations of systemic disease. *AustFam Physician*38:498–505.
17. Levv L, Zeichner JA. (2012). Dermatologic manifestation of diabetes. *J Diabetes*, 4:68–76.
18. Mahajan S, Koranne RV, Sharma SK. (2003). Cutaneous manifestations of diabetes mellitus. *Indian J DermatolVenereolLeprol*, 69: 105-108.
19. Muller SA. (1966). Dermatologic disorders associated with diabetes mellitus. *Mayo Clinic Proc*, 41: 689-703
20. Muller SA, Winkelman RK. (1966).Necrobiosislipoidicadiabeticorum: A clinical and pathological investigation of 171 cases. *Arch Dermatol*, 93: 272-282
21. Najdawi F, Fa,ouri M. (2002). Frequency and type of skin disorders and associated diabetes mellitus in elderly Jordanians. *East Mediterr Health J*, 8:574–8.
22. Nigam PK, Pande S. (2003). Pattern of dermatosis in diabetes. *Indian J Dermatol VenerolLeprol*, 69: 83- 85.
23. Paron NG, Lambert PW. (2000). Cutaneous manifestations of diabetes mellitus. *Prim Care*. 27:371-383.
24. Perez MI,Kohn.SR.(1994). Cutaneous manifestations of diabetes mellitus. *J Am Acad Dermatol*, 30:519-531.
25. Powers AC. (2005) Diabetes Mellitus. In: Kasper DL, Braunwald E, Fauci AS, Hauser SL, Longo DL, Jameson JL (eds). *Harrison's principles of internal medicine*. New York: McGraw-Hill, 2152-3.
26. Romano G, Moretti G, Di Benedetto A, Giofre C, Di Cesare , Russo G. (1998). Skin lesions in diabetes mellitus: Prevalence and clinical correlation. *Diabetes Res ClinPract*, 39: 101-106.
27. Sanad EM, ElFangary MM, Sorour NE, ElNemisy NM. (2013). Skin manifestations in Egyptian diabetic patients: a case series study. *Egyptian Journal of Dermatology and Venereology*, 33:56–62
28. Shahzad M, Al Robaee A, Al Shobaili HA, Alzolibani AA, Al Marshood AA, Al Moteri B. (2011). Skin Manifestations in Diabetic Patients Attending a Diabetic Clinic in the Qassim Region, Saudi Arabia. *Med PrincPract*, 20:137–141
29. Shaikh BA, Shaikh WM, Solangi GA, Sangi SA, Abro HA Shaikh AM. (2006). Diabetes Mellitus (Diagnosed & Undiagnosed) in acute myocardial infarction. *Med Channel*, 12(2):36–9.
30. Sibbald RG, LandoltSG, Toth D. (1996). Skin and diabetes. *EndocrinolMetabClin North Am*, 25: 463-472
31. World Health Organization. (1999). Definition, diagnosis and classification of diabetes mellitus and its complications: report of a WHO consultation. Part 1. Geneva, Switzerland: World Health Organization.
32. Yasso FS, Yaso SS, Yasso PS. (2013). Skin Manifestations of Diabetes Mellitus among Iraqi Patients. *American Journal of Medicine Studies*, Vol. 1, No. 3: 32-37
33. Yosipovitch G, Hodak E, Vardi P, Shraga I, Karb M, Spreacher E. (1998). The prevalence of cutaneous manifestation in Insulin Dependent Diabetes mellitus patients and their association with diabetic risk factors and microvascular complications. *Diabetes Care*, 21: 506-9

المظاهر الجلدية لداء السكري لدى المرضى في عدن

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DOI: <https://doi.org/10.47372/uajnas.2015.n2.a12>

الملخص

أجريت هذه الدراسة الإسترجاعية على مرضى السكري الذين يعانون من أمراض جلدية والذين تمت معالجتهم في عيادتين خاصة للأمراض الجلدية في عدن خلال الفترة من يناير 2013 إلى ديسمبر 2014. مائتان وتسعة مريض بالسكري، منهم 123 (58.9%) من الإناث و 86 (41.1%) من الذكور، المسجلين في هذه الدراسة. تراوحت أعمارهم بين 12 و 88 عاماً بمتوسط عمر 54.7 ± 13.8 عاماً. كانت الغالبية العظمى من المرضى 91.8% مصابين بمرض السكري النوع الثاني و 8.2% مصابين بمرض السكري النوع الأول. كان 50.2% من المرضى الذين يعانون من مرض السكري النوع الثاني في الفئة العمرية 41-60 سنة، في حين أنّ مرضى السكري الأول في الفئة العمرية 40 عاماً أو أقل يمثل 5%. الفرق بين القيم ذو دلالة إحصائية ($P < 0.05$). كانت مدة مرض السكري 5 سنوات و أقل في 88 (42.1%) من المرضى و 121 (57.9%) لديهم مرض السكري أكثر من 5 سنوات. كانت الغالبية العظمى من المرضى 90.4% مصابين بنوع واحد من الأمراض الجلدية، وكان 9.6% مزيج من نوعين من الأمراض الجلدية. الأنواع المختلفة من الأمراض الجلدية: سعفة القدم 44 (19.2%)، هراش أو حكة 22 (9.6%)، اعتلال الجلد السكري 19 (8.3%)، تقيح الجلد 17 (7.5%)، والأكزيما 15 (6.6%) والأمراض الأربعة الأخيرة كانت الورم الأصفر 1.7%)، الشحمانيبالي الحيوي 1.3%)، ضمور الدهون 1.3%) والصدفية الشائع 2 (0.9%). نستنتج أن إصابات الجلد يحدث في كثير من الأحيان لدى مرضى السكري. ولذلك ثمة حاجة قائمة لتقديم المعلومات والتثقيف والاتصال لمرضى السكري لزيادة وعيهم.

الكلمات المفتاحية: مرض السكري، المظاهر الجلدية، عيادات خاصة، عدن .