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Original Research Article

Some Dermatological Findings in Group of Diabetes Mellitus Patients in Mosul Province

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Abstract: ***Background*:** Diabetes mellitus affects individuals of all ages and of different socioeconomic status. Skin is affected by the acute metabolic derangements as well as by chronic degenerative complications of diabetes. About 30% complaint from cutaneous manifestations. ***Aims*:** To evaluate the presence of skin manifestations in patients with diabetes mellitus. To analyze the pattern of skin disorders among diabetic patients in Mosul city. ***Materials and Methods*:** 88 consecutive patients diagnosed diabetes mellitus and having skin lesions, either attending the diabetic clinic (Al-Wafaa diabetes and endocrine center) or admitted in medical wards were included in this study. ***Results*:** The results showed that : Diabetic dermopathy (23.86%), Ulceration (13.63%), Cellulitis (7.95%),Pruritus (7.95), Xerosis (5.68%), Tinea pedis (5.68%), Tinea manum (5.68%), Folliculitis (4.54%), Pityriasis versicolor 2.27%) , Diabetic bullae (2.27%), Granuloma annulare (2.27%), toenails Onychomycosis (2.27%) , Scleroderma diabeticorum (2.27%), Seborrheic keratosis (2.27%), Tinea corporis (2.27%), Keratosis pillaris (2.27%), Skin tags (2.27%), Bacterial infection of nail (2.27%), Boils (2.27%). ***Conclusion*:** The commonest skin finding in our diabetic patients was Diabetic dermopathy, the second most prevalence was Ulceration, Cellulitis and pruritus comes after it by, Xerosis, Tinea pedis Tinea manum , Folliculitis have the same distribution Pityriasis versicolor, Tinea corporis, pityrisis versicolor Diabetic bullae, Granuloma annulare, Onychomycosis toenails, Scleroderma diabeticorum, Seborrheic keratosis, Keratosis pillaris, Skin tags, Bacterial infection of nail, Boil. Have the same percentage of affection.

Keywords: Diabetes mellitus, Skin manifestations, Diabetic dermopathy, Ulceration, Infectious skin manifestations, Xerosis.

INTRODUCTION

Diabetes mellitus is a worldwide problem and the most common endocrine disorder [1]. Its prevalence is increasing in the present scenario of a sedentary lifestyle in the general population. Abnormalities of insulin and elevated blood glucose level lead to metabolic, vascular, neurological and immunological abnormalities. Affected organs include the cardiovascular, renal and nervous systems, eyes and the skin. The skin is affected by both the acute metabolic derangements and the chronic degenerative complications of diabetes [2, 3].

Skin manifestations Up to 30% of diabetic patients' complaint from skin manifestations. Which can be classified into five categories: vascular, neuropathic, infectious, specific diabetic skin manifestations and nonspecific manifestations.

Vascular., Non-specific diabetic skin manifestations include Xerosis, Keratosis pilaris, skin tags.

Acanthosis nigricans., where Specific skin manifestations include Diabetic dermopathy, Necrobiosis lipoidica diabeticorum, Diabetic bullae, Eruptive xanthomatosis, Scleroderma diabeticorum [18], and Neuropathic skin manifestations including Diabetic foot ulcers, Charcot neuroarthropathy, Diabetic amyotrophy, Diabetic neuropathy [19].

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Infectious skin manifestations Bacterial infections (cellulitis, folliculitis, impetigo), Fungal infections (tineas, onychomycosis, candidiasis), Viral infections (herpes simplex, herpes zoster) [20].

Diabetic dermopathy the most common specific diabetic skin manifestation, characterized by brown, scaly patches, most commonly found on the lower legs. Diabetic dermopathy is more prevalent in type 1 diabetic patients and is associated with poor glycemic control [5].

Necrobiosis lipoidica characterized by yellowish, waxy plaques, most commonly found on the shins. Also more prevalent in type 1 diabetic patients [6].

Diabetic bullae which are Large, fluid-filled blisters that appear suddenly on the hands, feet, legs, or forearms of people with diabetes. Diabetic bullae are rare but can be a sign of poor glycemic control [7]. Eruptive xanthomas Small, yellow or flesh-colored bumps that appear suddenly on the skin, usually on the buttocks, thighs, or arms. Eruptive xanthomas are rare but can be a sign of uncontrolled diabetes [8].

Scleroderma diabeticorum which is a rare diabetic cutaneous manifestation, which presents as thick, tight, and waxy skin, most commonly on the back of the neck and upper trunk. It is believed to be associated with hyperglycemia and vascular and connective tissue changes in diabetes mellitus [9], Granuloma annulare a relatively uncommon skin condition that can affect diabetics. Characterized by raised, reddish or skin-colored bumps that often form a ring or arc shape. These bumps can appear anywhere on the body, but are most commonly on the hands, feet, and ankles [17].

Nonspecific skin manifestation include Xerosis also known as diabetic dry skin, a common skin condition that affects diabetics characterized by dry, itchy, and flaky skin, particularly on the lower legs and feet [16]. Keratosis pilaris a skin condition that can occur in patients with diabetes mellitus. It is characterized by small, rough bumps on the skin, typically on the upper arms, thighs, and buttocks [21]. Skin tags that are small growths on the skin that can occur in diabetic patients. These growths are typically soft and may be the same color as the surrounding skin or slightly darker [22]. Seborrheic keratosis which is a benign skin growth that is commonly found in diabetic patients., characterized by raised, waxy, scaly patches on the skin that may be brown, black, or flesh-colored, can appear anywhere on the body but are most commonly found on the chest, back, and face [15], while Acanthosis nigricans a condition characterized by dark, velvety patches of skin, most commonly found on the neck, groin, and armpits, commonly associated with insulin resistance and is more prevalent in type II diabetics [4].

Neuropathic skin manifestations include Diabetic foot ulcers which is a common complication of diabetes mellitus, characterized by a break in the skin on the foot, often due to peripheral neuropathy or poor circulation [10]. Diabetic neuropathy that is a common complication of diabetes mellitus, characterized by damage to the nerves that results in a variety of symptoms, including pain, numbness, tingling, and muscle weakness, it can affect any part of the body, but most commonly the feet and legs [11].

While Infectious skin manifestations including Cellulitis which is a bacterial skin infection that occurs in diabetics. Symptoms include redness, swelling, pain, and warmth at the site of infection [12], Folliculitis in which a skin condition that affects diabetics and is caused by Staphylococcus aureus bacteria, presents as small, red, itchy bumps or pimples around hair follicles, which can become filled with pus and develop into painful boils [13].

Tinea including Tinea manuum a type of fungal infection that affects the hands of diabetics, is caused by the same fungus that causes athlete's foot and can spread from the feet to the hands [14]. Tinea corporis which is a fungal infection of the skin that can occur in diabetics. Characterized by a circular rash with raised edges and clear skin in the center. The rash may be itchy or painful and can occur anywhere on the body, but it is most commonly found on the trunk and limbs [23]. Tinea pedis also known as "athlete's foot,"which is a fungal infection of the feet that can occur in diabetic patients, characterized by itching, burning, and scaling of the skin on the feet, especially between the toes [24]. Pityriasis versicolor a fungal skin infection that can occur in diabetic patients characterized by patches of discolored skin, usually on the chest, back, and upper arms. The patches may be lighter or darker than the surrounding skin, and may also be scaly or itchy. Diabetic pityriasis versicolor is caused by a type of yeast known as Malassezia, which is normally present on the skin but can overgrow in warm and humid conditions [25].

Tinea of the nail (onychomycosis), also known as tinea unguium or fungal nail infection, is a common nail disorder that can occur in patients with diabetes mellitus caused by a fungal infection of the nails, usually the toenails, and can lead to thickened, discolored, and brittle nails. Diabetic onychomycosis is caused by a group of fungi known as dermatophytes, which thrive in warm and moist environments. Diabetic patients are more susceptible to onychomycosis due to poor circulation, weakened immune systems, and nerve damage [26].

Aim of the Study: To identify and evaluate the presence and pattern of skin findings of patients with diabetes mellitus in Mosul city.

PATIENTS AND METHODS

Study Design: Case serious study in Mosul city that lasted six months from March 2023 to October 2023.

Sample Collection

The samples were collected from AL-Wafaa Diabetic and endocrine diseases center in Mosul, a total of 88 patients were participating in the study between March 2023 to October 2023 in the Mosul city. We were able, during this period to estimate the prevalence of skin findings of patients with diabetes mellitus.

Criteria of Collected Data

The patients that included in the study were diagnosed based on their (fasting blood sugar test, random blood sugar test, urea and creatinine tests, HbA1c, lipid profile) by using a questionnaire and detection of skin findings.

Ethical Considerations

The study was conducted after obtaining the consent of the patients, (Nineveh health college of medicine) and (AL-Wafaa Diabetic Centre in Mosul) The study fully respected patients' confidentiality.

RESULTS

Table shows the number and percentage of patients according to age, gender, occupation, skin manifestation and duration

		Total	%
Age	<15y	4	4.45%
	15-45y	18	20.45%
	>45	66	75%
Gender	Female	37	42.05%
	Male	51	57.95%
Type of diabetes	Type I	9	10.2%
	Type II	79	89.7%
Duration	<5y	28	31.8%
	5-10y	18	20.4%
	>10y Count	42	47.7%
Type of treatment	Insulin	16	18.18%
	Oral hypoglycemic drugs	38	43.18%
	Mixed	34	38.63%
Hypertension	Yes	23	26.13%
	No	65	73.86%
Total		88	

The results of this work shows that: Diabetic dermopathy represented in (21) out of (88) diabetic patients which is equal to 23.86 % of all diabetic skin manifestation and 3 out of 9 patients 33.34% in type I patients and 18 out of 79 type II patients 22.7 % as shown in figure 1.

Figure 1: Diabetic dermopathy

Ulceration represented in (12) out of (88) diabetic patients which is equal to 13.63 % which was presented in type II diabetic patients only as shown in figure 2.

Figure 2: Diabetic foot ulcer

Cellulitis represented in (7) out of (88) diabetic patients which is equal to 7.95% 1 out 9 type I has diabetic bullae which is 11.1%while 6 out of 79 type II patients have this manfestation 7.6 % that is cellulitis more common in type I diabetic patients as shown in figure 3.

Figure 3: Cellulitis

Pityriasis versicolor represented in (2) out of (88) diabetic patients which is equal to 2.27% only in type I diabetic patients as shown in figure 4.

Figure 4: Pityriasis versicolor

Tinea infections included 12 out of 88 patients distributed as Tinea corporis in which represented as (2) out of (88) diabetic patients which is equal to % 2.27 one type I 11.11% and the other type II 1.26% ,while Tinea pedis , represented in (5) out of (88) diabetic patients which is equal to 5.68% one patient out 9 type I has tinea pedis 1.11% and the others 4 of type II patients i.e 5.06% and Tinea manum which was represented in [5], out of (88) diabetic patients which is equal to 5.68 % all type II patients as shown in figure 5.

Diabetic bullae, represented in [2], out of (88) diabetic patients which is equal to 2.7% % only in type II patients as shown in figure 6

Toenails Onychomycosis represented in [2], out of (88) diabetic patients which is equal to 2.27 % almost in type II patients as shown in figure 7

Figure 5: Tinea manuum

Figure 6: Diabetic bullae

Figure 7: Tinia unguium

Scleroderma diabeticorum represented in (2) out of (88) diabetic patients which is equal to 2.27 % in type II patients only as shown in figure 8

Figure 8: Scleroderma diabeticorum

Seborrheic keratosis represented in (2) out of (88) diabetic patients which is equal to 2.27% almost in type II as shown in figure 9.

Figure 9: Seborrheic keratosis

Xerosis represented in (5) out of (88) diabetic patients which is equal to 5.40 % almost type II diabetic patients when Folliculitis represented in (4) out of (88) diabetic patients which is equal to 5.40% one type I 11.11% and the other 3 of type II 3.8% while Granuloma annulare represented in (2) out of (88) diabetic patients which is equal to 2.27% almost type II patients.

Keratosis pillaris represented in (2) out of (88) diabetic patients which is equal to 2.27 % also one of type I patients 11.11% and the other of type II 1.26%, Skin tags represented in (2) out of (88) diabetic patients which is equal to 2.70 % almost type II patients.

Bacterial infections included bacterial infection of nail which represented in (2) out of (88) diabetic patients which is equal to 2.70% almost type II patients, Boil represented in (2) out of (88) diabetic patients which is equal to 2.27% one of type I 11.11% and the other one of type II 1.26%.

Pruritus represented in (7) out of (88) diabetic patients which is equal to 7.95 % all of type II patients.

DISCUSSION

Diabetes mellitus is a devastative chronic disease that affects many organs in the body including the skin this study provides database about types of skin manifestations between both types of DM patients and clinical characteristics in a study population.

With a mean age of 48.66±13.76 years. The study results reflected the fact that DM is more frequent in adults over the age of 40 years.

This is close to that reported by studies from Iran and Pakistan (54.0±11.0 years and 52.0±11.0 years) respectively. (27) Sex distribution in this study showed that 34% of study sample were females. This consistent with the study done by Arwaa (cutaneous manifestation of diabetes mellitus in Iraqi patients [30], where males were 60%, Probably because females do not always visit for checkup and management.

Almost finding was reported from studies in Belgrade-sebria and Egypt where 70% and 75% of the sample were females respectively which might be due to the high prevalence of obesity among females. In the present work 20.4% of patients presented with a duration of illness of five to ten years and only 47.7% had a duration of more than ten years, this result is comparative with the results of Pakistanian study, where only 10% of the sample had a duration of more than ten years [28]. Patients directly after diagnoses suffered from psychological shock and they were not able to adapt themselves with a new situation leading to bad compliance regarding regular visit. After that (5 to ten years later) patients started to accept their disease and manage it correctly. Later on when the disease extends for more than10 years, they start to develop complication and/or morbidities and their compliance significantly decreases.

Almost 35.95% of study sample have skin manifestation related to infection. The prevalence of infection is higher among type II than type I. This result is akin with the result of Hosseini *et al*., The proportion of type II was higher than type I; In the current study, two thirds than type I; In the current study, two thirds figure (99% versus 1%) was reported in Egypt A figure of 98% versus 2% was reported by in New Delhi [29]. Diabetic dermopathy was the commonest manifestation in our study and this consistent with study done by Arwa 2011 and Furqan *et al*., 2014 [30, 31].

All the results go with the fact that type II, worldwide, is more prevalent than type I due to increase in the problem of sedentary life style and obesity. A study carried out in Mosul reported that 38.5% of diabetic patients had foot lesions, after six months of weekly sessions of education about management of diabetes and life style modifications, only 5.8% reported such lesions. The results go with the present study notes about achieving glycemic control to reduce skin manifestations, it has been reported that educational approach allows the patient, educators, and physician to work together as a team to negotiate goals that are specific and achievable in order to decrease diabetic complications including skin manifestations. Thus, education of patients is helpful in treating present complications and preventing newer one.

In conclusions All DM patients had at least one type of skin manifestation. Skin infections were the prevalent especially in older (50 and above).

CONCLUSION

Skin findings are more in type 2 DM than in the type 1 DM, A number of new findings were observed. High occurrence of diabetic dermopathy which was the most common in our results. These findings are due to poorly controlled diabetes, and help doctors to be able to prevent serious complications.

Limitation:

This study has potential limitations; therefore, it is subjected to biases and confounding data that may presented in the results.

Small sample size When conducting our study, it is important to have a sufficient sample size in order to draw valid conclusions as the larger the sample, the more precise your results will be.

Normally, statistical tests require a larger sample size to ensure that the sample is considered representative of a population and that the statistical result can be generalized to a larger population.

Shortage of data there are little or no prior researches on specific skin manifestation of diabetes so we need more researches to be done.

Recommendation

Further researches with larger sample size are needed extending to all hospitals and primary health care centers to collect more data and to know the true epidemiology of the skin manifestation of diabetes.

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