

Prevalence of Cutaneous Manifestations of Diabetes Mellitus

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Abstract: Diabetes mellitus (DM) is a clinical syndrome characterized by hyperglycaemia due to absolute or relative insulin deficiency and it affects multiple system of body including the skin. The objective of our study was to evaluate the frequency of skin manifestations in patients with diabetes mellitus. A total of 240 diabetic (type 1 & 2) patients were examined in detail for skin manifestations of the disease. Number of patients with uncontrolled disease was 144 and 96 patients showed adequate glycaemic control. 150 patients i.e. 62.5% had cutaneous manifestations comprising of 126 (52.5%) type 2 and 24 (10%) type 1. The skin manifestations observed were: skin infection 42%, xerosis 12%, diabetic dermopathy 8%, vitiligo 8%, acanthosis nigricans 4%, diabetic thick skin 4%, keratosis 4%, senile purpuras 4%, lichen planus 2.67%, granuloma annulare 2.67%, lypodystrophy 2.67%, skin tags 2% of patients.

Key Words: Diabetes mellitus, Insulin, Cutaneous manifestations

I. Introduction

Diabetes mellitus is the most common endocrinal disorder and it is estimated that it will affect 300 million people worldwide by 2025 [1]. Abnormalities of insulin and elevated blood glucose level lead to involvement of multiple organ systems including cardiovascular, renal, nervous system, eyes and skin [2]. More than one third of diabetic patients have some type of dermatologic manifestations during the course of their chronic disease [3]. Abnormal carbohydrate metabolism, atherosclerosis, microangiopathy, neuron degeneration and impaired host mechanism all play roles in the pathogenesis of cutaneous complications. Urbach [4] showed that skin sugar levels run parallel to the blood sugar levels. Cutaneous signs of diabetes mellitus are extremely valuable to the clinician as some of them can alert the physician to the diagnosis of diabetes and also reflect the status of glycemic control and lipid metabolism [5]. It has been observed that without control of diabetes, the treatment response is poor in cutaneous complications [6].

Besides cutaneous manifestations certain skin diseases are strongly associated with diabetes mellitus. Thus, the present study was done to analyze the pattern of diabetic dermatosis in view of increasing prevalence of diabetes in the present scenario of sedentary life style in the general population.

II. Material and Methods

Two hundred forty consecutive patients with diagnosis of diabetes mellitus attending the medicine and dermatology outpatient departments and admitted to various wards of MBS Hospital (associated teaching hospital of Government Medical College, Kota) were studied. Consent was taken from all participants and they were thoroughly examined for cutaneous disorders and all clinically definable cutaneous lesions were recorded in a predesigned proforma. Patients were labeled controlled or uncontrolled diabetics on the basis of blood glucose measurement, one either random or fasting, at the time of presentation and glycosylated hemoglobin (HbA1c) levels. A detailed history was taken of each patient with particular reference to cutaneous complaints, including duration, progression and treatment modalities. A detailed clinical examination especially for the presence of muco-cutaneous lesions was done in natural light. Blood sugar was done in all patients. Glycosylated hemoglobin (HbA1c) levels were estimated in all patients to assess the control of diabetes. Histopathological examination of skin lesions and microbiological investigations were carried out wherever necessary to confirm the diagnosis.

III. Results

Among the 240 diabetic cases, 105 (43.75%) were females and 135 (56.25%) were males. The age of the patients ranged from 16 to 80 years with mean age of 51.25± 11.14 years. The majority (210, 87.5%) of diabetics had type 2 diabetes mellitus and only 30 (12.5%) had type I DM. Out of 240 diabetics, 150 (62.5%) had cutaneous manifestations while 90 (37.5%) of patients did not show any skin lesions. Male patients had higher frequency of skin disorders 90 (37.5%) as compared to female diabetics 60 (25%). The duration of DM ranged from 1-25 years. Of the total diabetic patients, majority 159 (66.25%) had 1-5 years of duration of diabetes mellitus, followed by 51 (21.25%) with more than 10 years. Patients who had poor glycemic control showed cutaneous manifestations. Majority 144 (60%) of the patients were with uncontrolled DM whereas only 96 (40%) patients showed glycaemic control. All the patients were receiving some anti-diabetic medicine. (Table-1)

Among the cutaneous disorders found in patients with DM, 63 (42%) of patients had skin infections. The commonest skin infection was bacterial observed in 33 (22%) of diabetics followed by fungal in 27 (18%) and viral in 3 (2%) of diabetics. The second most skin disorder was xerosis detected in 18 (12%) of diabetic population. Diabetic dermopathy, vitiligo and acanthosis nigricans were observed in 12 (8%), 12 (8%) and 6 (4%) of diabetic patients, respectively. Diabetic thick skin was seen in 6 (4%) patients and the same no. of patients (six in number for each lesion) had keratosis, pruritus (localized and generalized) and senile purpura. Lichen planus, granuloma annulare, lipodystrophy (both localized and generalized) and skin tags were least common and detected in 4 (2.67%), 4 (2.67%), 4 (2.67%) and 3 (2%) of the diabetes mellitus respectively. (Table-2)

IV. Discussion

Diabetes mellitus is a disease which commonly involves the skin. Minor skin manifestations are ignored by the patients and they seek help of the doctor only if there is any major problem which does not heal with ordinary medications. In this study 62.5% of patients had some kind of cutaneous manifestations of diabetes mellitus as it has been reported in the range from 11.24% to almost 100% in various other studies [7-9]. Our results indicate that skin disease were more in men than in women. A study from Sargodha, Pakistan found skin disorders similar to our study i.e. more in men than women.[10] Majority (87.5%) of patients were suffering from Type-2 DM and only small number (12.5%) of patients were with type-1 DM. This trend of occurrence of diabetes mellitus was comparable to various other studies reported both nationally and internationally. Mean age of diabetic patients in this study was 51.25 years whereas in a survey done in Karachi Pakistan, it was 51.5 years. [3] The high prevalence of diabetes mellitus in this age means that majority of diabetics were suffering from the disease in their most productive years of life.

Majority (60%) of patients had uncontrolled DM and 40% of diabetics showed glycaemic control. These results were similar to those reported by *Bhat et al.*[11] This is indicative of high tendency of diabetic complication, as uncontrolled DM increases the risk of development of microangiopathy and related sequelae. [12-14]

The commonest skin manifestations observed in the study was skin infection found in 42% of diabetics. The types of infections were bacterial 22%, fungal 18% and viral 2%. *Naeed et al* [15] from Lahore reported cutaneous infection in 62.2% of diabetics, *Meracle et al* [9] found skin infection in 54.69% diabetics, *Baloch et al* [16] observed prevalence of skin infection in 72% of diabetics, *Nawaf et al* [17] reported skin infection as the commonest manifestation in diabetics and *Radhu et al* [18] found fungal infection more common in type 2 diabetics. In contrast, a study from Sargodha Pakistan [10] reported skin infection in 23% of diabetic patients. The relative high prevalence of skin infections in this study could be due to poor hygienic conditions as well as uncontrolled (i.e. 60% of patients) diabetes mellitus which increase the risk of development of micro-angiopathy and related sequelae.

Second most common skin disorder found in this study is xerosis, although various studies on cutaneous lesions in diabetic patients do not comment on the prevalence of xerosis. In diabetes we found xerosis in our study. Xerosis has not been mentioned in most of the studies. However, our study shows more incidence of xerosis. The clinical observations are supported by objective findings of a reduced hydration state of the stratum corneum and decreased sebaceous gland activity in patients with diabetes, without any impairment of the stratum corneum barrier function [19]. The third commonest finding, vitiligo was found in 8% of the studied patients. This prevalence was much higher (8 times) than in a similar previous study reported from india [11]. Diabetic dermopathy, in the form of small, brown-scar-like macules on both chin were seen in 8% of patients. 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. [20] Acanthosis nigricans was found in 4 % of patients, though *Mashkoo et al* [21] found acanthosis nigricans in 11% of patients which is almost three fold of our study. Pruritus was found in 4% of

diabetic patients in our study. Other similar previous studies reported the prevalence of pruritus were 15.1% and 49% [22, 23] which is much higher than our study.

Some of the less common findings observed in this study are keratosis, senile purpuras, lichen planus, granuloma annulare, lipodystrophy and skin tags have also been reported by other similar studies. We did not see any adverse drug reaction to oral hypoglycemic, however lipodystrophy to insulin was seen in 3 patients at injection site.

V. Conclusion

Cutaneous manifestations are quite common in type 2 diabetes mellitus and whenever patients present with multiple cutaneous manifestations should be evaluated for diabetes mellitus and its systemic complications. Patients should be educated about blood glucose control as well as skin and foot care.

References

- [1]. Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projection for 2030. *Diabetes Care* 2004; 27: 1047- 1053.
- [2]. Giligor RS, Lazarus GS. In. *Diabetes Mellitus*, eds. Rifkin H, Raskin P, Bradyco, Louna 1981; 313-321.
- [3]. Greenwood AM. A study of skin in 500 diabetics. *JAMA* 1927; 89: 774- 779.
- [4]. Urbach E. Skin diabetes (hyperglycidermia) without hyperglycemia. *JAMA* 1945; 129: 433.
- [5]. Urbach K, Lentz JW. Carbohydrate metabolism and skin. *Arch Dermatol Syphilol* 1965; 52: 301-304
- [6]. Pastras T, Beerman H. Some aspects of dermatology in diabetes mellitus. *Am Med J* 1964; 247: 563- 566.
- [7]. Bashier AH, Kordofani YM. Clinico-epidemiological study of cutaneous manifestations of diabetes mellitus in Sudanese patients. *Sud J Dermatol* 2004;2(2):54-60.
- [8]. Majeed M, Iqbal F, Mehboob A. Cutaneous manifestations in type-1 and type-2 Diabetes Mellitus (A study profile of 200 patients). *Proceeding Shaikh Zayed Postgrad Med Inst* 2004;18(2):63-8.
- [9]. Miracle LS, Barreda BF. Cutaneous manifestations of diabetes mellitus, a clinic manner for identify the disease. *Rev Endocrinol Nutr* 2005;13(2):75-87.
- [10]. Mahmood T, Ul-Bari A, Agha H. Cutaneous manifestations of diabetes mellitus. *J Pak Assoc Dermatol* 2005;15:227-32.
- [11]. Bhat YJ, Gupta V, Kudyar RP. Cutaneous manifestations of diabetes mellitus. *Int J Diab Dev Ctries* 2006;26:152-5.
- [12]. Mahajan S, Koranne RV, Sharma SK. Cutaneous manifestation of diabetes mellitus. *Indian J Dermatol Venereol Leprol* 2003;69(2):105-8.
- [13]. Majeed M, Iqbal F, Mehboob A. Frequency and association of cutaneous manifestations of diabetes mellitus with HbA1c. *Proceeding Shaikh Zayed Postgrad Med Inst* 2004;18(2):85-9.
- [14]. Afridi MAR, Khan MN. Role of health education in the management of Diabetes mellitus. *J Coll Physicians Surg Pak* 2003;13(10):558-61.
- [15]. Naheed T, Akber N, Akber N, Shahzad M, Jamil S, Ali T. Skin manifestations among diabetic patients admitted in a general medical ward for various other medical problems. *Pak J Med Sci* 2002;18(4):291-6.
- [16]. Baloch GH, Memon NM, Devrajani BR, Iqbal P, Thebo NK. Cutaneous manifestations of Type-II diabetes mellitus. *J Liaquat Uni Med Health Sci* 2008;7(2):67-70.
- [17]. Nawaf A, Amr Z, Ashok KS and Mazen A. Cutaneous manifestations of diabetes mellitus. *Med Princ Pract* 2006;15:427-30.
- [18]. Radhu TY, Vinayak V, Kanthraj GR, Girisha BS. Study of cutaneous manifestations of diabetes mellitus. *Ind J Dermatol* 2004;49(2):73-5.
- [19]. Sakai S, Kikuchi K, Satoh J, Tagami H, Inoue S: Functional properties of the stratum corneum in patients with diabetes mellitus: similarities to senile xerosis. *Br J Dermatol* 153:319-323, 2005.
- [20]. Foss NT, Polon DP, Takada MH, Foss-Freitus ML. Skin lesions in diabetic patients: *Rev. Saudi Publica* 2005;39 (9) 677-82.
- [21]. Mashkoor Ahmed Wani, Iffat Hasssan, Mohd Hayat Bhat, and Quzi Masood Ahmed. Cutaneous Manifestations of Diabetes mellitus: A Hospital Based Study in Kashmir, India. *Egyptian Dermatology Online Journal* 5 (2):
- [22]. Najdawi F, Faouri M. Frequency and type of skin disorders and associated diabetes mellitus in elderly Jordanians. *East Mediterr Health J* 2002;8:574-8.
- [23]. Al-Mutairi N, Zaki A, Sharma AK, Al-Sheltawi M. Cutaneous manifestations of diabetes mellitus of diabetes mellitus: Study from Farwaniya Hospital, Kuwait. *Med Princ Pract* 2006; 15(6):427-30.

TABLE-1: PATIENTS CHARACTERISTIC (n=240)

Parameters	Value
Gender distribution	
Female	105(43.75%)
Male	135(56.25%)
No of patients having skin disorder	150(62.5%)
No of type 2 DM patients having skin disorders	126(52.5%)
No of type 1 DM patients having skin disorders	24(10%)
No of patients having no skin disorder	90(37.5%)
Age of patients	
Mean+-SD years	51.25+-11.14
Range(years)	16-80
Type of DM	
Type 2 DM	210(87.5%)
Type 1 DM	30(12.5%)
Duration of DM	
Up to 5 years	159(66.25%)
5-10 years	51(21.25%)
>10 years	30(12.5%)
Status of DM	
Uncontrolled	144(60%)
Controlled	96(40%)
Status of treatment of DM	
On oral hypoglycaemics	144(60%)
On Insulin	69(28.75%)
On combination therapy	27(11.25%)
No treatment	NIL

Table: 2 Cutaneous manifestations observed in diabetics

Skin manifestations	Type 2 DM	Type 1 DM	F	M	Total
Skin infections	48(32%)	15(10%)	24(16%)	39(26%)	69(42%)
Bacterial	24(16%)	9(6%)	12(8%)	21(14%)	33(22%)
Fungal	21(14%)	6(4%)	9(6%)	18(12%)	27(18%)
Viral	3(2%)	0(0.0%)	3(2%)	0(0.0%)	3(2%)
Xerosis	18(12%)	0(0.0%)	3(2%)	15(10%)	18(12%)
Vitiligo	6(4%)	6(4%)	12(8%)	0(0.0%)	12(8%)
Dermopathy	12(8%)	0(0.0%)	0(0.0%)	12(8%)	12(8%)
Acanthosis nigricans	6(4%)	0(0.0%)	6(4%)	0(0.0%)	6(4%)
Diabetic thick skin	6(4%)	0(0.0%)	3(2%)	3(2%)	6(4%)
Keratosis	6(4%)	0(0.0%)	0(0.0%)	6(4%)	6(4%)
Pruritus	6(4%)	0(0.0%)	3(2%)	3(2%)	6(4%)
Senile purpuras	6(4%)	0(0.0%)	3(2%)	3(2%)	6(4%)
Lichen planus	4(2.67%)	0(0.0%)	1(0.67%)	3(2%)	4(2.67%)
Granuloma annulare	4(2.67%)	0(0.0%)	3(2%)	1(0.67%)	4(2.67%)
Lipodystrophy	1(0.67%)	3(2%)	2(1.33%)	2(1.33%)	4(2.67%)
Skin tags	3(2%)	0(0.0%)	1(0.67%)	2(1.33%)	3(2%)
TOTAL	126(84%)	24(16%)	61(40.67%)	89(59.33%)	150

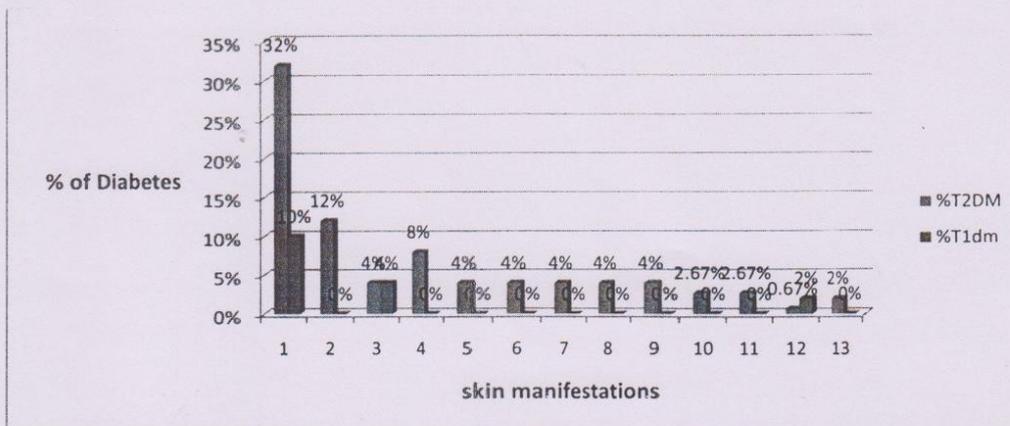


Figure:1-1.skin infections 2.xerosis 3.Vitiligo 4.Dermopathy 5.Acanthosis nigricans 6.Diabetic thick skin 7.Keratosis 8.Pruritus 9.Senile pupuras 10.Lichen planus 11. Granuloma annulare 12.Lipodytrophy 13. Skin tags.



Figure: 2 vitiligo

Figure: 3 tinea



13



Figure: 4 Acanthosis



Figure: 5 Xerosis