Section: Dermatology

Original Research Article

A CLINICAL STUDY ABOUT CUTANEOUS MANIFESTATIONS OF DIABETES MELLITUS: A TERTIARY CARE TEACHING HOSPITAL BASED STUDY

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ABSTRACT

Background: Among endocrine disorders, diabetes mellitus (DM) is the most prevalent. Numerous mucocutaneous symptoms of diabetes mellitus range in severity from minor to fatal, and they frequently signal the start of the disease.
Material and Methods: Regardless of the length of their diabetes, 250 consecutive patients with DM who attended the WCMSRH dermatology and medicine OPD throughout a 15-month period and were willing to participate in the study were included.
Results: Among the patients, 210 (84.0%) took oral hypoglycemic medications, 10 (4.0%) took insulin, 12 (4.8%) took both, and 18 (7.2%) received no treatment at all. According to the HbA1c values, DM that is uncontrolled is defined as >8%, moderate control as 7.1-8%, and good control as <7%. 122 (48.8%) had uncontrolled diabetes, while 128 (51.2%) had good control.
Conclusion: Patients with diabetes mellitus frequently experience mucocutaneous involvement, particularly when their condition is inadequately managed. The length of the diabetes increases the cutaneous symptoms. In diabetic people, appropriate skin care and long-term blood glucose control may improve quality of life and lower the risk of developing various skin lesions.
Keywords: Cutaneous manifestation, nonspecific dermatoses & Diabetes Mellitus.

INTRODUCTION

Our nation has seen a significant increase in the prevalence of diabetes mellitus (DM), making it the nation with the highest number of diabetics worldwide.[1] Acute metabolic disturbances and long-term degenerative consequences of diabetes both have an impact on the skin.[2] Chronic hyperglycemia, which leads to the formation of advanced glycosylation end products (AGE), is the pathophysiology of diabetic problems.[3] Skin is a window through which internal organs can be visualised. Skin symptoms can frequently aid in the diagnosis of internal diseases. The disease's early detection and treatment are greatly aided by cutaneous signs. DM, or diabetes mellitus, is a prevalent endocrine condition. Globally, the incidence of diabetes mellitus is rising, maybe as a result of altered eating patterns, lifestyle choices, and numerous other causes. Depending on glycemic management and the length of the disease, cutaneous signs of diabetes can take several forms. Due to the long-term consequences of hyperglycemia on skin collagen and microcirculation, almost all patients with DM eventually see changes in their complexion.[4] Additionally, cutaneous adverse effects have been linked to anti-diabetic medications. Moreover, skin sores associated with diabetes could act as a point of entry for germs and perhaps lead to secondary infections. Although cutaneous manifestations appear subsequent to the development of DM, they may be the first/ presenting sign or even precede the diagnosis of diabetes by years.[5] Therefore, skin

symptoms may aid in the early detection of diabetes. The conventional technique for evaluating long-term glucose control is the measurement of glycated haemoglobin (HbA1c).[6] The pattern of skin manifestations can change based on the HbA1c levels, which indicate the glycemic management. Additionally, the course of the disease may have an impact on the pattern of cutaneous symptoms. Therefore, the purpose of this study was to determine the prevalence of mucocutaneous manifestations in patients with diabetes mellitus (DM) based on hospital data, the clinical pattern of mucocutaneous lesions among these patients, and the relationship between these manifestations and the length of diabetes and glycemic management.

MATERIAL AND METHODS

This present study was conducted in the department of Dermatology, World College of Medical Sciences Research and Hospital, Jhajjar. The institute's ethical board granted the study its ethical clearance before it could begin. Regardless of the length of their diabetes, 250 consecutive patients with DM who attended the WCMSRH dermatology and medicine OPD throughout a 15-month period and were willing to participate in the study were included. The study excluded participants with internal cancer, HIV, gestational diabetes, other fatal conditions, and hyperglycemia brought on by steroids. Following the acquisition of informed permission, a thorough medical history was obtained, covering the duration of diabetes, cutaneous symptoms, other systemic disorders, and the course of therapy. Comprehensive systemic and cutaneous exams were performed, and the results were recorded in a proforma created especially for the study. Every patient had their postprandial and fasting blood sugar readings, HbA1c, full hemogram, and urine tests performed. When required, pertinent histological and microbiological analyses were carried out. Calculations were made for descriptive statistics such mean, frequency, and percentage. Chi square analysis was performed as needed for data analysis.

RESULTS

Among 250 patients with DM, 156 (62.4%) were males and 94 (37.6%) were females with a male to female ratio 1.65:1. Youngest patient was aged 16 years and the eldest, 75 years, with a mean age of 48.6±10.02 years. Three 03 (1.2%) patients had type 1 DM and 247 (98.8%) had type 2 DM. The duration of DM varied between 0 (newly diagnosed cases) to 35 years, with a mean duration of 8.24 ± 1.08 years. Majority i.e 132 (52.8%) had diabetes for a duration 1-5 years. Two hundred and ten (84.0%) patients were taking oral hypoglycemic agents, 10 (4.0%) were on insulin, 12 (4.8%) were taking both and 18 (7.2%) were not on any treatment. Based on the levels of HbA1c >8% refers to uncontrolled DM, 7.1-8% refers to moderate control and <7% refers to good control of DM. Majority of the patients ie 128 (51.2%) had good control and 122 (48.8%) had uncontrolled diabetes. Associated systemic diseases were present in 140 (56%) patients. Most common being hypertension in 102 (40.8%) patients, followed by dyslipidemia 21 (8.4%), ischemic heart disease 4 (1.6%), hypothyroidism and pulmonary tuberculosis 3 (1.2% each), cerebrovascular accident and epilepsy 2 (0.8% each).

We divided the patients into seven groups according to the cutaneous signs of DM, including: 1) Cutaneous infections, 2) Diabetic reticulum and ischemic cutaneous illness, 3) Dermatoses linked to microangiopathy 4) Skin diseases that are metabolic in nature 5) Dermatoses frequently linked to diabetes 6) Cutaneous responses to diabetes treatment (Table 1) and 7) Non-specific skin conditions. (Refer to Table 2)

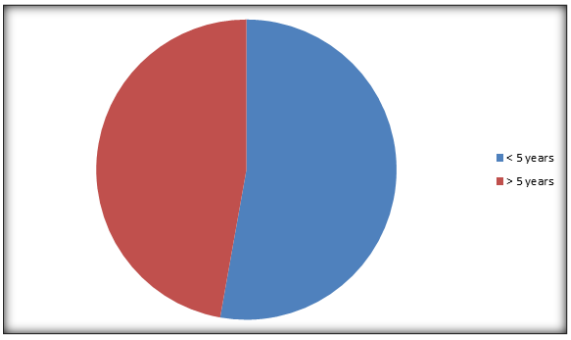

Figure 1: Duration of Diabetes

Table 1: Diabetes mellitus patients' varied dermatoses

Category of Dermatoses	Dermatoses	No. of cases (N=250) (%)
Cutaneous infections	Fungal infections	80 (32.0%)
	Bacterial infections	16 (6.4%)
	Viral infections	11 (4.4%)
	Parasitic infestations	02(0.8%)
Neuropathic and ischemic diabetic skin disease	Diabetic foot ulcer	04 (1.6%)
	Peripheral vascular disease	01 (0.4%)
Dermatoses associated with microangiopathy	Diabetic dermopathy	03 (1.2%)
	Granuloma annulare	02(0.8%)
	Bullous diabeticorum	02(0.8%)
Metabolic skin disease	Xanthelasma palpabrarum	02(0.8%)

Dermatoses commonly associated with diabetes mellitus	Acrochordons	36(14.4%)
	Cherry angiomas	23(9.2%)
	Psoriasis	21(8.4%)
	Generalized pruritus	11(4.4%)
	Acanthosis nigricans	10(4.0%)
	Lichen planus	06(2.4%)
	Vitiligo	05(2.0%)
	Diagonal ear lobe crease	04 (1.6%)
	Terry' s nails	03 (1.2%)
	Pigmented purpuric dermatoses	02(0.8%)
	Perforating dermatoses	02(0.8%)
	Localized cutaneous amyloidosis	02(0.8%)
Dermatoses due to complication of diabetes treatment	Insulin lipodystrophy	02(0.8%)

Table 2: Patients with diabetes mellitus can suffer from a variety of nonspecific dermatoses

Sr. no.	Dermatoses	No. of cases (%)	Sr. no.	Dermatoses	No. of cases (%)
1.	Seborrheic keratoses	29(11.6%)	16.	Addisonian pigmentation	02(0.8%)
2.	Xerosis	16 (6.4%)	17.	Erythema multiforme	02(0.8%)
3.	Eczema	12 (4.8%)	18.	Lentigines	02(0.8%)
4.	Idiopathic guttate hypomelanosis	09 (3.6%)	19.	Alopacia areata	01(0.4%)
5.	Lichen simplex chronicus	06(2.4%)	20.	Senile comedones	01(0.4%)
6.	Contact dermatitis	06(2.4%)	21.	Acne vulgaris	01(0.4%)
7.	urticaria	05(2.0%)	22.	Solar melanosis	01(0.4%)
8.	Cutaneous vasculitis	04 (1.6%)	23.	Air borne contact dermatitis	01(0.4%)
9.	Acquired icthyosis	03 (1.2%)	24.	Miliaria	01(0.4%)
10.	Seborrhoeic dermatitis	03 (1.2%)	25.	Squamous cell carcinoma	01(0.4%)
11.	Polymorphous light eruptions	02(0.8%)	26.	Actinic cheilitis	01(0.4%)
12.	Rosacea	02(0.8%)	27.	Baboon syndrome	01(0.4%)
13.	Chronic actinic dermatitis	02(0.8%)	28.	Hidradenitis suppurativa	01(0.4%)
14.	Melasma	02(0.8%)	29.	Pachydermoperiostoses	01(0.4%)
15.	Hirsuitism	02(0.8%)	30.	Sebaceous cyst	01(0.4%)

Table 3: Relationship of cutaneous manifestatons with glycemic control

Control status of Diabetes mellitus	Total no. of patients	No. of patients with cutaneous manifestations (%)	No. of patients without cutaneous manifestations (%)
Controlled diabetes mellitus (HbA1c<7%)	128(51.2%)	95(74.2%)	33(25.78%)
Uncontrolled diabetes mellitus (HbA1c>7%)	122(48.8%)	110(90.16%)	12(9.83%)

Table 4: Relationship of cutaneous manifestations with duration of diabetes

Duration of diabetes	Total no. of patients	No. of patients with cutaneous manifestations (%)	No. of patients without cutaneous manifestations (%)
< 5 years	132 (52.8%)	99 (75%)	33 (25%)
> 5 years	118 (47.2%)	98 (83.05%)	20 (16.94%)

DISCUSSION

Skin acts as a mirror, reflecting internal illnesses. Diabetes mellitus is a systemic illness that impacts all organ systems, including the skin. Indeed, cutaneous manifestations could be the initial clue to the disease.

The prevalence of cutaneous manifestations has varied from 61% to 89.7% in earlier studies.[7] In our study, 82.2% patients had cutaneous manifestations. Majority of the patients belonged to the 5th and 4th decade comprising 32.4% and 26.2% respectively. Cutaneous manifestations were also more common in patients belonging to 5th decade followed by 4th decade. Similar frequencies were seen in earlier studies by Mahajan et al,[8] Nigam and Pande.[7] In our study, dermatoses having association with diabetes were the most common cutaneous manifestations, followed by cutaneous infections. Bhat et al,[2] reported similar findings, while Mahajan et al,[8]Nigam and Pande,[7] Tamshina et al,[9]Rao et al,[10]Vahora et al,[11] reported infections to be the most common cutaneous manifestation. Among the various dermatoses associated with diabetes, acrochordons were the most common, seen in 14.4% patients. Acrocordons were also single most common dermatoses found in our study. Previous studies have reported an association between multiple acrochordons and diabetes.[12] Acanthosis nigricans, a sign of insulin resistance was observed in 4.4% patients. Increased insulin binds to insulin like growth factor receptors, stimulating growth of keratinocytes and dermal fibroblasts, resulting in

development of acanthosis nigricans.[3] Generalised pruritus is one of the common conditions seen in DM. This could be due to associated xerosis among these patients. Advanced Glycosylation end products of stratum corneum proteins or autonomic neuropathy may be attributed to the pathogenesis of xerosis and pruritus in DM.[13] Generalised pruritus was found in 4.4% of our patients. Pruritus was reported in 4.5% by Nigam and Pande,[7] 10% by Mahajan et al,[8] and 15.2% by Timshina et al.[9] Psoriasis until recently was only thought to be a cutaneous disease. Recently, psoriasis has been increasingly associated with metabolic syndrome, diabetes, hypertension and other diseases.[14] Psoriasis was reported in 3% patients by Mahajan et al,[8] 2.2% and by Timshina et al.[9] We observed psoriasis in 8.4% of patients in our study. Infections were one of common dermatoses observed in our study, which was present in 43.6% patients. Impaired chemotaxis, leucocyte adherence and phagocytosis and impaired immunity in uncontrolled diabetes and ketoacidosis predisposes them to prolonged and recurrent infections.[15]

Fungal infections formed largest group of cutaneous infections found in 32.0% of patients. Fungal infections were common in studies by Mahajan et al[8] (54.68%) and Bhat et al[2] (34.34%). Diabetic microangiopathy is characterised by thickening of capillary basement membrane leading to progressive occlusion of vascular lumen causing impaired perfusion.[16] In our study, 2.8% had dermatoses associated with microangiopathy, wherein 1.2% had diabetic dermopathy, 0.8% both had granuloma annulare and diabetic bullae. Diabetic dermopathy has been considered as one of the most common cutaneous manifestations, reported in upto 50% of patients in western literature, in contrast to lower incidence in Indian patients. This may possibly be due to dark complexion in our country, rendering it difficult to detect.[4] Raghunatha et al[4] reported 0.2% of diabetic dermopathy and 0.4% diabetic bullae. Nigam and Pande[7] reported 3.5% & 1%of diabetic bullae, similar to our study. We did not come across any case of necrbiosis lipoidica diabeticorum or rubeosis facei. In our study, diabetic foot ulcers were seen in 1.6% patients. Bhat et al[2] in their study, observed 04 (1.6%) cases of diabetic foot ulcers. Mahajan et al,[8] Rao et al,[10] Raghunatha et al,[4] and Nigam and Pande[7] found diabetic foot ulcers in 8,1,1 and 6 cases respectively. Only 0.8% of our patients presented with lipodystrophy secondary to insulin therapy, while Raghunatha et al[4] found 1.8% affected. Out of 121 patients with non-specific manifestations majority of them had eczema (4.8%), 6.4% had xerosis in and 11.6% had seborrheic keratosis. Two patients each (0.8%) had PMLE, CAD, melasma and rosacea.

CONCLUSION

The current study was started in order to understand the range of DM's cutaneous manifestations. The most prevalent dermatoses in diabetics were discovered to be infections. Cutaneous signs may make a doctor more dubious about the DM diagnosis. By starting the right treatment program early, this aids in the prevention of systemic derangements. A long-term blood glucose control program and proper skin care can lower the chance of developing some of the skin lesions associated with diabetes. Therefore, dermatologists can be very helpful in managing diabetic patients, lowering morbidity, and enhancing quality of life.

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