

Cutaneous manifestations in diabetes mellitus

A S Hogade¹, Saranya Gadde^{2*}, Vishal Wali³

¹Professor and HOD, ²PG Resident, ³Assistant Professor, Department of Dermatology, M. R. Medical College, Kalaburgi, Karnataka, INDIA.
Email: saranyagadde99@gmail.com

Abstract

Introduction: Diabetes mellitus (DM) can be complicated by a variety of cutaneous manifestations. Good metabolic control may prevent some of these manifestations and may support cure. Unfortunately, most glucose-lowering drugs also have cutaneous side effects. It is important to be able to recognize these signs and symptoms and to either treat them appropriately or refer the patient to a dermatologist or diabetologist. Skin is affected by the acute metabolic dearrangements as well as by chronic degenerative complications of diabetes. **Aim:** To evaluate the prevalence of skin manifestations in patients with diabetes mellitus and analyze the pattern among the local population of our centre. **Material and Methods:** 50 patients of Type-2 Diabetes Mellitus attending the skin OPD at Basaveshwar Teaching and General Hospital and Sangameshwar Hospital of MR Medical College, Gulbarga. **Result:** The common skin disorders were: Cutaneous infections (39%), Skin tags (31%), Xerosis (14%), Diabetic dermopathy (7%), Acanthosis nigricans (6%) and Others (3%). **Conclusion:** Nearly all patients with diabetes eventually develop cutaneous manifestations of the disease. Cutaneous signs of the disease can heighten the suspicions of a physician regarding the diagnosis of diabetes. **Keywords:** Cutaneous manifestations, Diabetes mellitus.

*Address for Correspondence:

Dr. Saranya Gadde, Postgraduate Resident, Department of Dermatology, M. R. Medical College, Kalaburgi-585105, Karnataka, INDIA.
Email: saranyagadde99@gmail.com

Received Date: 20/12/2015 Revised Date: 16/01/2016 Accepted Date: 14/02/2016

Access this article online	
Quick Response Code:	Website: www.statperson.com
	DOI: 03 March 2016

INTRODUCTION

Type 2 DM is a heterogeneous group of disorders characterized by variable degrees of insulin resistance, impaired insulin secretion, and increased glucose production. Distinct genetic and metabolic defects in insulin action and or secretion give rise to the common phenotype of hyperglycemia in type 2 DM. Type 2 DM is preceded by a period of abnormal glucose homeostasis classified as impaired fasting glucose (IFG) or impaired glucose tolerance (IGT). According to The International Diabetes Federation (IDF) there are 40.9 million diabetics in India and is set to rise to 69.9 million by the year 2025.¹ Chronic hyperglycemia resulting in production of advanced glycosylated end products (AGE) is responsible for most of the complications of diabetes.² Most common endocrine disorder affecting various organ systems including skin. Skin disorders are present in 79.2% of people with diabetes.³ Cutaneous disease can appear as

the first sign of diabetes. Mucocutaneous infections are commonly associated with DM which leads to various skin complications like fungal infections (Balanoposthitis, Tinea infections, Candidal intertrigo, Paronychia, Oral and genital candidiasis), bacterial infections (Folliculitis, Furuncles, Carbuncle, Pyodermas, Cellulitis, Ecthyma), Skin diseases associated with DM (Diabetic dermopathy, Necrobiosis lipoidica, Granuloma annulare, Diabetic bullae, Scleroderma diabeticorum, Limited joint mobility, Acanthosis nigricans), Skin manifestations due to diabetic complications (Neuropathy, Vascular disease and Foot ulcers), Skin changes to diabetic treatment (Oral hypoglycemic: Maculopapular eruptions to sulfonylureas, Lichenoid reactions, Urticaria, Erythema multiforme, Erythema nodosum, Disulfiram-like reaction to chlorpropamide, Insulin- Allergic reactions, Lipodystrophy, Keloids, Hyperpigmentation, Hyperkeratotic papules, Purpura).⁴ The Skin: Blood glucose ratio is higher in diabetics (70%) than in normal people (55%).⁵ The changes in normal skin of diabetics are,⁶ increased mast cells in the dermis, increased capillary fragility, thickening of capillaries and anhidrosis.

MATERIAL AND METHODS

100 cases of Type II Diabetes Mellitus with skin complaints were enrolled in the study with consent. Detailed history was taken and clinical examination was conducted in all cases. Relevant investigations were done in all cases.

Inclusion Criteria

- All confirmed (old and new) cases of Type II DM
- Both the sexes
- Age group: 20-60yrs.

Exclusion Criteria

- Pregnant women
- Patients on immunosuppressive drugs
- Patients with HIV AIDS
- Patients on dialysis
- Hyperglycemia due to chronic steroid intake
- Patients with malignancies

All participants’ ethical clearance was obtained with informed consent. In the selected patients, a detailed history with particular reference to demographic details, family history of similar complaints and of DM, duration of DM treatment details, duration of various symptoms and evolution of lesions was taken. The patients were clinically examined in good light, for various cutaneous manifestations of DM such as skin lesions, nail changes, mucous membrane involvement.

RESULTS

Figure 1: Epidemiological profile revealed male predominance Male - 65% and Female - 35%

Age in years	Sex		Total
	Male	Female	
21-30	10	8	18
31-40	15	10	25
41-50	25	9	34
51-60	10	4	14
61-70	3	3	6
71-80	65	35	100

Majority of cases (34%): 51-60years. Majority (64%): diagnosed cases of DM. Majority of patients (57%), belonged to low socio-economic group, followed by middle class (41%) and high socio-economic group patients (2%). DM patients need regular follow up and medicines to maintain good glycemic control. Patients belonging to low income group cannot afford such a lifestyle. Hence cutaneous manifestations are common in this socio-economic group.

Table 2: Duration of diabetes mellitus

Duration of DM	No. of Cases
6 mnths – 1yr	10
1yr – 5yrs	14
5yrs – 10yrs	20
10yrs – 15yrs	12
> 15yrs	6
Total	64

71.8% of patients, the duration of diabetes was <10 years. 36 cases with muco-cutaneous lesions were found to have diabetes on investigations. In this study 96 of patients had Non-Insulin Dependant DM, out of which 42 were females and 54 were males, whereas only 4 males had Insulin Dependant DM.

Known/ Unknown cases of diabetes mellitus

Out of the 100 cases, 64% were known patients and 36% were unknown patients of DM. Most of the patients presented with the following Symptoms: Dryness of skin, Pruritus, Change in color of the skin, Skin lesions, Genital lesions, Loss of sensation, Ulcers, Pain, Oral lesions, Nail changes, Tightness of the skin. Infections formed majority of the cutaneous manifestations which was 60%. Out of which 44% was Fungal, 14% was Bacterial and 2% was viral. Cutaneous markers accounted for 10% of the total cases followed by Diabetic Foot (9%). Out of the 44% of fungal infections the following were more predominant: Tinea Corporis (8%), T Cruris (6%), C. Balanoposthitis (6%), C. Intertrigo (4%), Oral Candidiasis (6%), C. Vulvovaginitis (5%), Onychomycosis (5%), T. Pedis (1%) and P.Versicolor (3%) In Bacterial Infections: Furuncles (7%), Carbuncles (3%), Ecthyma (3%) and Cellulitis (2%) were noted. Septic skin conditions were more common in patients with poor glycemic control observed in 6 cases (62.9%).

DISCUSSION

Skin disorders in DM are most of the times a mirror of the underlying disease process and they may be the first expression of the disease. In the Present study of diabetic subjects who attended, the percentage of IDDM cases was 4% and that of NIDDM was 96%. In this study involving 100 patients with DM, the commonest age group affected was 40-59 years, 56%. This is followed by 60-69 age group, 20% then 30-39 years age group 14% over 70 years, 6% and the least is in the 20-29 years age group which was 4%, in par with Thomas George *et al*^[8] who observed majority of their patients i.e. 68% and 86% respectively were above 40 years of age. Out of 100 cases studied, 42 were females (59.5%) and 58 were males (40.5%), ratio being 1.3:1 The usual duration of DM with majority of patients was 1-5 years i.e. 46%. In 1%, the duration of DM was more than 40 years and 2% had duration of more than 25 years. Diabetes Mellitus is a chronic metabolic disorder; hence it needs a sustained interest on the part of the patients to undergo drastic changes in food habits and life style and to maintain good glycemic control. The interest of the patient generally wanes in the disease after certain period by which time the patient starts developing the complications. Bacterial Infection was observed in 14% of total subjects studied

which is consistent with the study of Thomas George *et al*, according to which, bacterial infections were 15%. I.C. Anand⁹ observed 15.38% patients with Pyoderma had DM. Furunculosis was recorded in 2% of the cases studied. In the present study furunculosis was seen in 2% of the total cases studied which was higher than the above series. In the present study 1 case of Erythrasma was diagnosed. The largest group in the present study are of fungal infections constituting 44%. Out of which infection with dermatophytes was 20%, candida infection in 21% and P.Versicolor 3%. Thomas George *et al*. (1976)⁸ found an incidence of 30% of dermatophytosis where as I.C Anand⁹ reported 13.33% of their patients with dermatophytosis had DM, Green Wood (1927)¹⁰ had reported its incidence to be 40%. The present study shows lower figures (21.5%) compared with the study of Thomas George *et al* (30%) but figure of (10%) is close to IC Anand's observations (13.33%). In the present study acrochordons was seen in 20% of patients. M. Kahana *et al*¹¹ observed 26.3% of patients with skin tags having diabetes mellitus while Margolis¹² found incidence of diabetes among acrochordon patients to be around 72.3%. This study nearly coincides with the study of M. Kahana *et al*. In the present study Diabetic Dermopathy was the third commonest skin disorder observed in 18 patients studied (18%). Danowski¹³ found Dermopathy in 21.5% of normal student while it was found in 2% of non-diabetics by Sawheny MPS¹⁴; Sawheny in 1990 found diabetic dermatopathy in 17.8% of the subjects. Male to female ratio was almost equal in their study and it was more common with advancing age and the duration of diabetes was more than 5 years. In the present study Xerosis was seen in 12% patients. There was dryness of the lower extremities as well as the forearms in the subjects. Majority of the patients had poor glycemic control, this and the environmental factors in some of them could have been responsible in addition to occupational factors. In this study 4% cases of vitiligo in NIDDM patients were encountered. Dawber (1968)¹⁵ found 4.8% of maturity on set of diabetes mellitus to have concomitant vitiligo. Late onset Vitiligo, after the age of 40 years would appear to have closer association with diabetes. This study is closer to Dawber study. Conliffe *et al.*, in 1968¹⁶ demonstrated higher incidence of DM in the families of patients with Vitiligo. In the present study 3% cases of diabetic ulcer of foot were recorded all belonging to NIDDM patients. The duration of DM ranged from less than 1 year to 34 years. Poor glycemic control was observed in 2% cases. Bacterial culture from the infected ulcers showed staphylococcus in 2% cases. Localized Granuloma Annulare was detected in 1% of patients. The association of granuloma annulare and DM is controversial. Dabski *et al* (1989)¹⁷ observed 21% of

patients with generalized granuloma annulare had associated DM. 2% of Bullous diabeticorum were recorded, one of IDDM (1%) and 1% of NIDDM type. These cases had longstanding DM from 6 to 12 years. In the present study 3% cases presented with Psoriasis. There is a controversy regarding the association of Psoriasis with DM. Greenwood¹⁰ showed 2.5% of Psoriasis patients had diabetes which was 10 times more than the Control group in his study. The present study showed 2% cases of Lichen Planus. Thomas George *et al*⁸; found 2% of Lichen Planus in their study. The present study showed 2% cases of Lichen Planus. Thomas George *et al*⁸; found 2% of Lichen Planus in their study. K.C. Verma *et al*¹⁸, R.K Jain *et al.*, Sheila Powell *et al*¹⁹; found abnormal Glucose tolerance test in 56%, 60% and 62% of LP patients respectively. This study is closer to observation of Thomas George *et al*. There was a single case of maculo-papular eruption in a patient taking Daonil tablets (1%). The cutaneous reactions are less frequent with second generation sulphonylureas and common with first generation sulphonylureas. There were no side effects to insulin reported in this study.

CONCLUSION

Long-term effects of DM on the microcirculation and dermal collagen eventually result in skin disorders in almost all the diabetic patients. They can increase the likelihood of exposure to infectious organisms and contact allergens, resulting in chronic and recurrent infections and eczemas. A good glycemic control definitely reduces the incidence and severity of cutaneous disorders, as observed in the present study. It is necessary to have a dermatologist in the diabetic clinic along with other specialists for early detection and provide a comprehensive diabetic care to the patients. Dermatologists play an important role in reducing the dermatologic morbidity, improvement of quality of life, and management strategy of diabetic patients.

REFERENCES

1. Sicree R, Shaw J, Zimmet P. Diabetes and impaired glucose tolerance. In: Gan D, editor. Diabetes atlas. International diabetes federation; 2006. pp. 15–103. International Diabetes Federation; 2006. pp. 15–103.
2. Kalus AA, Chien AJ, Olerud JE. Diabetes mellitus and other endocrinal disorders. In: Wolff K, Goldsmith LA, Katz SI, Gilchrist BA, Paller AS, Lefell DJ, editors. Fitzpatrick's Dermatology in General Medicine. 7th ed. Newyork: McGraw Hill Medical; 2008. pp. 1461–84.
3. Demirseren DD, Emre S, Akoglu G, et al. Relationship between skin diseases and extracutaneous complications of diabetes mellitus: clinical analysis of 750 patients. Am J Clin Dermatol 2014;15:65–70

4. Perez MI, Kohn RS. Cutaneous manifestations of Diabetes Mellitus. *J Am Acad Dermatol* 1994; 30(4):519-529.
5. Savin JA. The etiology and treatment of erythrasma. *J Invest Dermatol* 1961; 37:283.
6. Peterka ES, Fusaro RM. Cutaneous carbohydrate studies III. *J Invest Dermatol* 1966; 47:410-411.
7. American Diabetes Association. Standards of medical care in diabetes-2007. *Diabetes Care*. 2007; 30:S4-S41.
8. Thomas T George et al; "Cutaneous manifestations of DM- A study of 50 cases"; *IJDVL* 1976; 42(6); 261-266.
9. Anand I.C. : "Assesment of diabetic state in various skin disorders usually associated with hyperglycemia": *IJDVL*, 1978; 44(2): 95-102.
10. Greenwood A.M, 1927; "A study of the skin in 500 cases of diabetes". *JAMA*, 89:774.
11. Kahana M et al: "Skin tags – a cutaneous marker for DM".; *Acta Derma Venerol- Stockh*, 1987; 67(2): 175-177.
12. Margolis J and Margolis LS: "Skin tags – a frequent sign of DM"; *New Engl. J. of Med.* 1976; 294(21); 1184.
13. Danowski F.S. et al: "Skin spots and diabetes mellitus", *Am. J. of Med. Sci*, 1966; 251: 570-75.
14. Sawhney MPS et al; "Diabetic microangiopathy, clinicopathological correlation"; *IJDVL*, 1992; 58; 172-78.
15. Dawber R.P.R.: "Vitiligo in maturity onset D.M." *BJD*, 1968, 80: 275.
16. Cunliffe W.J., Hall R., Newell, D.J. and Stevenson, G.J. (1968) Vitiligo, Thyroid disease and autoimmunity. *BJD*, 80, 135.
17. Dabski K et al; "Generalized granuloma annulare : Clinical and laboratory findings in 100 patients"; *J Am Acad Dermatol*, 1989 Jan; 20(1):39-47.
18. Verma K.C. et al; "GTT in Lichen Planus" *IJDVL*, 1978; 44(5); 278- 279.
19. Sheila Powell M et al; "Glucose tolerance in LP."; *BJD*, 1974; 91:73-75.

Source of Support: None Declared
Conflict of Interest: None Declared