

**ORIGINAL RESEARCH**

**A Prospective Study of Dermatological Findings in Patients suffering from Diabetic Mellitus**

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**ABSTRACT**

**Background:** Early diagnosis and management of DM is extremely important to enhance the understanding to improve the outcome of the disease. These symptoms can be prevented easily just by managing the body metabolism.

**Material and Methods:** This study was conducted in the department of Dermatology and Medicine in a tertiary care teaching hospital. This study involved 200 consecutive patients attending Dermatology OPD with skin features related to Diabetes. The study was done over a period of 2 years.

**Results:** Out of 200 patients, 98 were males and 102 were females. Thus preponderance of female was noted in our study. Out of 55 Type 1 DM patients, 30(54.5%) were males and 25(45.5%) were females. Among all totally 37 cases (18.5%) had dermatophyte infections. Wet mount examination of the skin lesions in 10% KOH showed long hyaline branching septate hyphae and arthrospores in almost the cases.

**Conclusion:** The present study evaluated the prevalence and types of cutaneous disorders associated with DM and thus, established the role of dermatologists in their management.

**Keywords:** Diabetic Mellitus, Dermatophytes, Septate hyphae.

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**INTRODUCTION**

It has been observed that Diabetes mellitus (DM) is one of the most frequent endocrine disorders. It has been found to cause an extra load on patients, their families and society in which they live as well as to treating doctors and hospitals.<sup>[1,2]</sup> In U.S., 1.1 crore people have been reported to be suffering from DM and the prevalence of insulin dependence has been found to be 90% out of these patients.<sup>[3]</sup> Around 30-82% of diabetic population has been diagnosed to be suffering from various cutaneous disorders such as acanthosis nigricans and pigmented purpuric dermatosis.<sup>[4,5,6]</sup> These cutaneous disorders can be of four types: a) cutaneous infections, b) cutaneous disorders having association with DM, c) cutaneous disorders due to DM complications, and d) cutaneous disorders due to reactions to DM treatments.<sup>(6,7)</sup> Early diagnosis and management of DM is extremely important to enhance the understanding to improve the outcome of the disease. These symptoms can be prevented easily just by managing the body metabolism.<sup>[8]</sup> To the contrary of metabolism control, various cutaneous side effects have been reported by some glycemic control medications.<sup>[9]</sup> Therefore, the patients who have DM related cutaneous disorders should be thoroughly investigated for DM.<sup>[10]</sup> DM is a dreadful disorder which needs interdisciplinary approach.

Therefore, the aim of the present study is to find out and evaluate the prevalence and types of DM cutaneous disorders and to establish the role of Dermatologists in its management.

## MATERIALS & METHODS

**Study Area:** - This study was conducted in the department of Dermatology and Medicine in a tertiary care teaching hospital.

**Study Population:-** This study involving 200 consecutive patients attending dermatology OPD with skin features related to diabetes.

**Study Duration:-**The study was done over a period of two year.

**Data Collection:** - Prospective observational study involving 200 consecutive patients either attending dermatology OPD with skin features related to diabetes. A detailed medical history pertaining diabetes was elicited in each patient with particular reference to the cutaneous complaints including duration, history of evolution and progression. An informed consent was taken from each patient, after which a general physical examination, systemic examination and a detailed dermatological examination carried out and the relevant details recorded and tabulated. Specific and non-specific skin findings related to diabetes mellitus was documented.

**Data Analysis:-** Data were analysed by using Microsoft Excel.

## RESULTS

Out of 200 patients, 98 were males and 102 were females. Thus preponderance of female was noted in our study. Out of 55 Type 1 DM patients, 30(54.5%) were males and 25(45.5%) were females. Out of 145patients of type 2 DM, 68(46.9%) were males and 77(53.1%) were females. The Mean duration of type 1 DM in thus study was found to be around 5.2 years and in type 2 DM around 5.9 years, which was statistically significant. Among all totally 37 cases (18.5%) had dermatophyte infections. Prevalence in type 1 DM is 16.4% and type 2 is 19.3%. Tinea corporis is most common type in both Diabetic mellitus. 3 patients in type 1 DM and 7 patients in type 2 DM were found to have chronic dermatophytosis.4 patients in were recurrent and refractory to treatment with systemic antifungals. No cases of Tinea capitis were found in the present study. Wet mount examination of the skin lesions in 10% KOH showed long hyaline branching septate hyphae and arthrospores in almost the cases.

**Table 1: Distribution of cases according to gender**

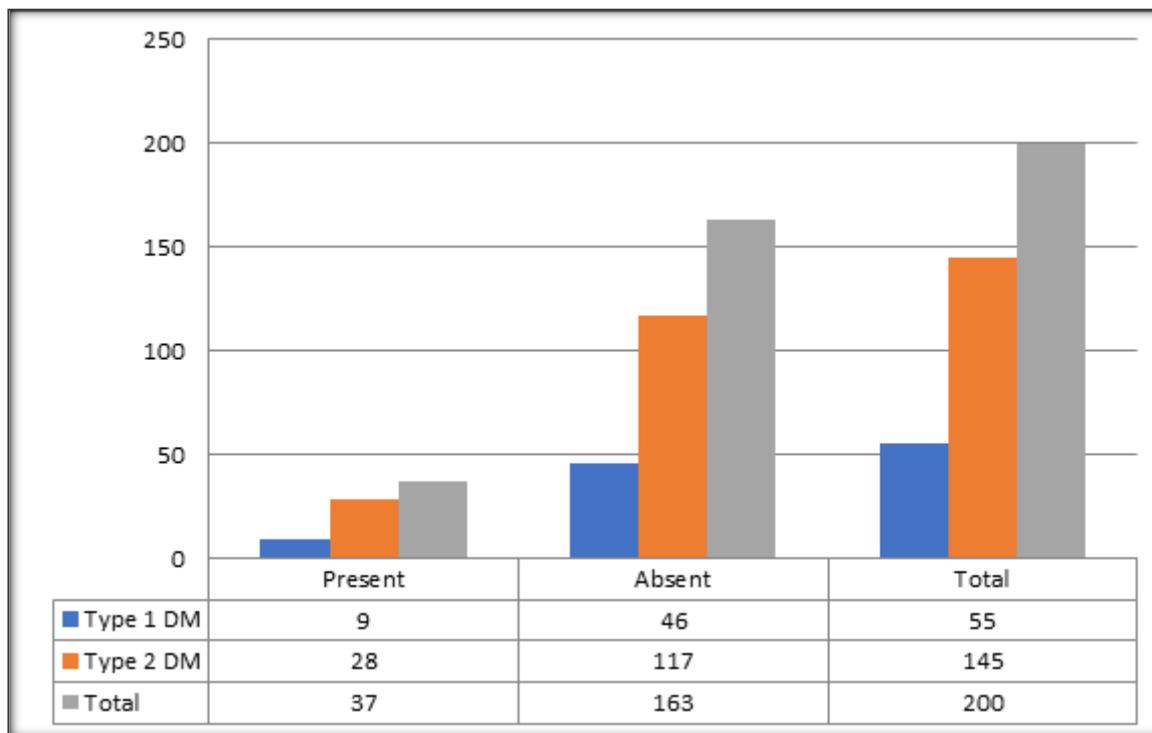
Gender	Type 1 DM	Type 2 DM	Total
Female	25	77	102
Male	30	68	98
Total	55	145	200

**Table 2: Distribution of cases according to age**

Age	Type 1 DM	Type 2 DM	Total
<20	9	0	9
21-40	46	11	57
41-60	0	107	107
>60	0	27	27
Total	55	145	200

**Table 3: Distribution of cases according to duration of DM**

Duration of DM	Mean	SD	P value
Type 1 DM	5.2	5.4	0.32
Type 2 DM	5.8	3.7	

**Chart:-1 Distribution of cases according to fungal infection****Table 4: Distribution of cases according to dermatophytes**

Isolates	Type 1 DM	Type 2	Total
Tinea corporis	4	14	18
Tinea cruris	3	8	11
Tinea pedis	2	6	8
Total	9	28	37

## DISCUSSION

As per the literature, Type 1 DM (T<sub>1</sub>DM) is found usually in the young age group with incidence between 10 to 14 years of age. While, Type 2 DM (T<sub>2</sub>DM) is commonly found in the middle and elderly age group with a gradual onset.<sup>[11]</sup> In the present study, T<sub>1</sub>DM was more common in young people with an incidence rate of 54.5%; while, T<sub>2</sub>DM was diagnosed in middle aged people with an incidence rate of 39.3%. Both types of DM were seen most frequently among age groups from 41 to 50 years with incidence rate of 28.5%. These findings were almost similar to the findings of Bhat et al.,<sup>[12]</sup> Mahajan et al.,<sup>[13]</sup> and Roshini vahora et al,<sup>[14]</sup> where the incidence rates were 33.3%, 33%, 40% respectively in age group of 41 - 50 years. In the present study, the females have higher prevalence in comparison to males (51% and 49% respectively). These findings were supported by findings of Mahajan<sup>98</sup> et al showing increased female prevalence of 58% in comparison to males with prevalence of 42%. On the other hand, the study of Abhisheck goel et al,<sup>[15]</sup> and Roshini vahora et al,<sup>[14]</sup> observed DM to be lesser prevalent in females having prevalence of 46% and 49%

respectively. In the present study, 27.5% of patients (n = 55) were having IDDM while 72.5% of patients (n = 145) were having NIDDM. Similarly, Mahajan et al,<sup>[13]</sup> and Bhat et al,<sup>[12]</sup> had the more patients of T<sub>2</sub>DM but their prevalence was much more (98% and 97.7% respectively) in comparison to the present study. In contrast to their findings, any case of secondary diabetes or gestational diabetes was not found in the present study.

In the present study, the mean duration of IDDM and NIDDM were 5.2 and 5.9 years respectively and these findings were statistically significant in comparison to findings of the mean duration in case of Bhat,<sup>[12]</sup> et al and Ahmed,<sup>[16]</sup> et al where they had the mean duration of DM around 10 years in their almost all the patients.

The incidence of cutaneous disorders in DM patients were found to be between 30% and 71% in most of the studies.<sup>[17,18]</sup> Mahajan et al,<sup>[13]</sup> and Nigam & Pande,<sup>[19]</sup> found incidences of cutaneous dermatomes in 64% and 61% of patients in their studies respectively. Bhat et al,<sup>[12]</sup> observed cutaneous disorders in 66% of the cases and 21.3% of the controls.

## CONCLUSION

We all know that DM is a very common endocrine disorder having frequent episodes of cutaneous manifestations. Almost 80% of patients of DM develop cutaneous disorder at least once in the course of DM. It is extremely important not to overlook the sign and symptoms of cutaneous manifestations as delay in diagnosis and treatment of these disorders may significantly affect the quality of life. The present study evaluated the prevalence and types of cutaneous disorders associated with DM and thus, established the role of dermatologists in their management.

## REFERENCES

1. G. Han, "A new appraisal of dermatologic manifestations of diabetes mellitus," *Cutis*, vol. 94, no. 1, pp. E21–E26, Jul 2014.
2. R. Vahora, S. Takkar, and Y. Marfatia, "Skin, a mirror reflecting diabetes mellitus: A longitudinal study in a tertiary care hospital in Gujarat," *Indian Journal of Endocrinology and Metabolism*, vol. 17, no. 4, pp. 659–664, 2013.
3. F. Tecilazich, A. Kafanas, and A. Veves, "Cutaneous alterations in diabetes mellitus," *Wounds*, vol. 23, no. 7, pp. 192–203, 2011.
4. G. Pierard, S. Seite, T. Hermanns-Le, A. Delvenne, A. Scheen, ^ and C. Pierard-Franchimont, "The skin landscape in diabetes mellitus. Focus on dermocosmetic management," *Clinical, Cosmetic and Investigational Dermatology*, vol. 6, pp. 127–135, 2013.
5. A. S. Karadag, E. Ozlu, and M. J. Lavery, "Cutaneous manifestations of diabetes mellitus and the metabolic syndrome," *Clinics in Dermatology*, vol. 36, no. 1, pp. 89–93, 2018.
6. M. I. Perez and S. R. Kohn, "Cutaneous manifestations of diabetes mellitus," *Journal of the American Academy of Dermatology*, vol. 30, no. 4, pp. 519–531, 1994.
7. N. G. Paron and P. W. Lambert, "Cutaneous manifestations of diabetes mellitus," *Primary Care—Clinics in Office Practice*, vol. 27, no. 2, pp. 371–383, 2000.
8. K. R. R. Schons, "Cutaneous manifestations in diabetes mellitus," in *Dermatology in Public Health Environments: A Comprehensive Textbook*, R. R. Bonamigo and S. I. T. Dornelles, Eds., pp. 719–738, Springer International Publishing, Cham, 2018.
9. S. Van Hattem, A. H. Bootsma, and H. B. Tio, "Skin manifestations of diabetes," *Cleveland Clinic Journal of Medicine*, vol. 75, no. 11, pp. 772–787, 2008.
10. L. Levy and J. A. Zeichner, "Dermatologic manifestation of diabetes," *Journal of Diabetes*, vol. 4, no. 1, pp. 68–76, 2012.

11. Parks Textbook of Preventive and Social Medicine, 19 th ed. Jabalpur: Banarsidas bhanot Publishers; 2007. p. 327-31
12. Bhat YJ, Gupta V, Kudyar RP. Cutaneous manifestations of diabetes mellitus. *Int J Diab Dev Ctries* 2006;26:152-5.
13. Mahajan S, Karanne RV, Sharma SK. Cutaneous manifestation of diabetes mellitus. *Indian J Dermatol Venereol Leprol* 2003;69:105-8.
14. Roshnivahora, Sejalhakar, Yogesh Marfatia. Department of Dermatology, Medical College and SSG Hospital, A longitudinal study in a tertiary care hospital in Gujarat Vadodara, Gujarat,. *Skin, a mirror reflecting diabetes mellitus. Year : 2013 Volume : 17 Issue : 4 Page : 659-664.*
15. Abhishek goyal, Sujeet Raina, Satinder S kaushal, Vikram Mahajan N and Lal Sharma, *Indian Journal of Dermatology. Patterns of cutaneous manifestations in diabetes mellitus. 2010 Jan -Mar; 39–41.* John D. Bancroft, Alan Stevens, *Theory and Practice of histological techniques; 2nd edition; 95- 122.*
16. Ahmed K, Muhammad Z, Qayum I. Prevalence of cutaneous manifestations of diabetes mellitus. *J Ayub Med Coll Abbottabad* 2009;21:76-9.
17. Halprin KM, Ohkawara A. Glucose entry into the human epidermis, I: the concentration of glucose in the human epidermis. *J Invest Dermatol* 1967;49:559–560.
18. Yosipovitch G, Hodak E, Vardi P, et al. The prevalence of cutaneous manifestations in IDDM patients and their association with diabetes risk factors and microvascular complications. *Diabetes Care* 1998; 21:506–509.
19. Nigam PK, Pande S. Pattern of dermatoses in diabetics. *Indian J Dermatol Venereol Leprol* 2003;69:83-5.