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## **An evaluation of skin manifestations in type 2 diabetes mellitus**

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**Abstract**---Background: Diabetes mellitus (DM) is a common endocrinopathy and assumes significance for its ability to adversely affect the various internal organs. The present study was conducted to assess skin manifestations in type II diabetes mellitus patients. Materials & Methods: 108 patients of type II diabetes mellitus of both genders were enrolled. Blood sugar level was determined on venous samples. Urine microscopy, renal function tests, fasting lipid profile, electrocardiogram, 24 h urine protein estimation, and fundoscopy were performed wherever indicated. Results: Out of 108 patients, males were 60 and females were 48. Cutaneous manifestations in type II DM patients was bacterial infection in 12, fungal infection in 10, viral infection in 8, diabetic bullae in 6, dermatopathy in 3, tropic ulcer in 2, acanthosis nigra in 7, wet gangrene in 5, peripheral neuropathy in 3 and hirsutism in 2 cases. The difference was significant ( $P < 0.05$ ). Conclusion: Most common cutaneous manifestation in type II diabetes mellitus patients was bacterial infection, fungal infection, viral infection, diabetic bullae, dermatopathy, tropic ulcer and acanthosis nigra.

**Keywords**---acanthosis nigra, dermatopathy, tropic ulcer.

### **Introduction**

Diabetes mellitus (DM) is a common endocrinopathy and assumes significance for its ability to adversely affect the various internal organs. It can also derail the immune system of the affected. Hence, it is not surprising for diabetes to affect skin (the largest organ) producing different lesions. At times, evaluation for skin

lesions leads to diagnosis of underlying diabetes. In a known diabetic, skin changes may provide warning signals regarding systemic involvement.

In the classification of cutaneous manifestations in DM, they are divided into four categories: (1) cutaneous diseases with weak to strong association with DM; (2) cutaneous infections; (3) cutaneous manifestations of DM complications; and (4) cutaneous reactions to DM treatments. Long-term DM duration causes permanent and irreversible functional changes and damage to body cells, and therefore, it leads to problems arising from biochemical, structural, and functional anomalies. Cutaneous complications of DM provide a clue to the current and past metabolic status of the patient. Cutaneous infections occur in 20- 50% of patients and are often along with moderate blood glucose control. Microvascular circulatory disorders, peripheral vascular diseases, peripheral neuropathy, and immune responses reduction are all contributing factors to an increased susceptibility of infection. Common cutaneous infections, staphylococcal infections, are more perilous and severe in patients with uncontrolled DM. Other types of infection include styes that cause tuberculosis of eyelid and also bacterial infection of the nails. The present study was conducted to assess skin manifestations in type II diabetes mellitus patients.

### Materials & Methods

The present study comprised of 108 patients of type II diabetes mellitus of both genders. They were enrolled after they agreed to participate. Data such as name, age, gender etc. was recorded. A thorough clinical examination was carried out. Blood sugar level was determined on venous samples. Urine microscopy, renal function tests, fasting lipid profile, electrocardiogram, 24 h urine protein estimation, and funduscopy were performed wherever indicated. Histopathology and microbiology analyses were carried out wherever necessary to confirm the diagnosis. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

### Results

Table I Distribution of patients

Total- 108		
Gender	Males	Females
number	60	48

Table I shows that out of 108 patients, males were 60 and females were 48.

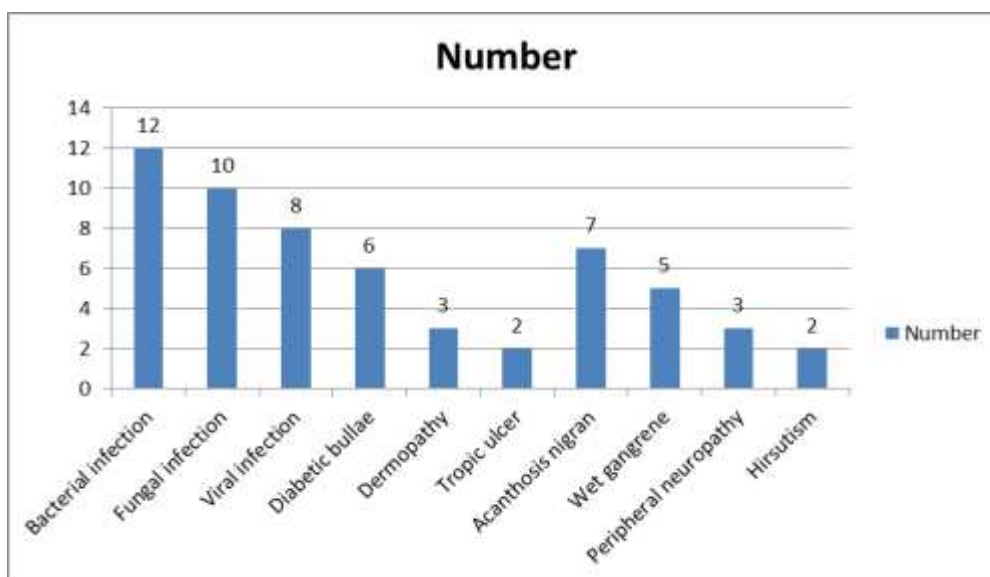
Table II Type of cutaneous manifestations

Cutaneous manifestations	Number	P value
Bacterial infection	12	0.01
Fungal infection	10	
Viral infection	8	
Diabetic bullae	6	
Dermopathy	3	

Tropic ulcer	2
Acanthosis nigran	7
Wet gangrene	5
Peripheral neuropathy	3
Hirsutism	2

Table II, graph I shows that cutaneous manifestations in type II DM patients was bacterial infection in 12, fungal infection in 10, viral infection in 8, diabetic bullae in 6, dermopathy in 3, tropic ulcer in 2, acanthosis nigran in 7, wet gangrene in 5, peripheral neuropathy in 3 and hirsutism in 2 cases. The difference was significant ( $P < 0.05$ ).

Graph I Type of cutaneous manifestations



## Discussion

Diabetes mellitus (DM) is the most common endocrine disorder with a significant burden on the patients, health care system, and the society.<sup>6</sup> About 11 million people in the USA are diagnosed with DM, of which 90% are insulin-independent DM.<sup>7</sup> Some cutaneous manifestations related to DM such as acanthosis nigricans and pigmented purpuric dermatosis are the signs of macrovascular complications. At least 30% of patients with DM are affected by different types of cutaneous disorders during the chronic course of their disease.<sup>8,9</sup> The present study was conducted to assess skin manifestations in type II diabetes mellitus patients.

We found that out of 108 patients, males were 60 and females were 48. Roslind et al<sup>10</sup> studied the cutaneous manifestations in patients with type 2 diabetes mellitus (DM) in comparison to normal subjects and to document the association between cutaneous manifestations and complications of DM. In this 1-year

comparative cross-sectional study, 100 patients receiving treatment at the diabetic clinic of a tertiary center were evaluated for cutaneous manifestations and complications due to diabetes. The cutaneous features in diabetics were compared with that of normal controls. An attempt was made to find out any association between cutaneous features of DM and internal organ involvement due to diabetes. Cutaneous manifestations were more frequent in patients with type 2 DM than normal controls. The most common manifestation in diabetics was fungal infection followed by bacterial infection. Diabetic dermopathy was found to have statistically significant association with nephropathy, retinopathy, and neuropathy due to type 2 DM.

We observed that cutaneous manifestations in type II DM patients was bacterial infection in 12, fungal infection in 10, viral infection in 8, diabetic bullae in 6, dermopathy in 3, tropic ulcer in 2, acanthosis nigran in 7, wet gangrene in 5, peripheral neuropathy in 3 and hirsutism in 2 cases. Mailini et al<sup>11</sup> assessed general health condition and anthropological parameters of the working women, identify prevalence of Type-II Diabetes among them, assessed risk factors associated with development of diabetes. A total of 100 working women were selected as study population. During the two-month study period, Fasting Blood Sugar (FBS) was estimated to identify the diabetics and the Impaired Glucose Tolerance (IGT). Information from the study population was collected through pre-tested questionnaire using several anthropometric measurements. Out of 100 women, 24 were having FBS compatible with IGT or diabetes. The incidence was highest in 46 to 55 yr age group. 75% of women with diabetes or IGT were in higher income group. Body Mass Index was more than 25 kg/m<sup>2</sup> in maximum (75%) women having diabetes or IGT. 92% women with diabetes or IGT had their Waist Hip Ratio  $\geq 0.85$ . Moreover, orientation towards healthy life style modification to control diabetes and its prevention was poor among the study population.

Azizian et al<sup>12</sup> assessed the prevalence and variety of DM skin and nail manifestations in an effort to further acquaint dermatologists and other clinicians with diabetic dermatologic manifestations. Among a total of 255 subjects, the prevalence of one or more identifiable skin conditions was 88.4%. 15.7% of the subjects had nail manifestations. Among cutaneous manifestations, acanthosis nigricans, acral erythema, and onychoschizia showed a significant relationship with the age and disease duration ( $p < 0.05$ ); and knuckle pebbles, eczema, facial erythema, and koilonychias had a meaningful relationship with FBS level and glycated hemoglobin, HbA1c ( $p < 0.05$ ). Ramachandran A et al<sup>13</sup> found that lower incidence of diabetes in lower income group, compared to middle income group in Southern India which may probably due to pattern of physical activity in lower income group.

## **Conclusion**

Authors found that most common cutaneous manifestation in type II diabetes mellitus patients was bacterial infection, fungal infection, viral infection, diabetic bullae, dermopathy, tropic ulcer and acanthosis nigran.

## References

1. Blakytyn R, Jude EB. Altered molecular mechanisms of diabetic foot ulcers. *Int J Low Extremity Wounds*. 2009;8(2):95–104.
2. Obrosova IG. Increased sorbitol pathway activity generates oxidative stress in tissue sites for diabetic complications. *Antioxid Redox Signal*. 2005;7(11–12):1543–52.
3. Stern D, Yan SD, Yan SF, Schmidt AM. Receptor for advanced glycation endproducts: a multiligand receptor magnifying cell stress in diverse pathologic settings. *Adv Drug Deliv Rev*. 2002;54(12):1615–25.
4. Hu H, Jiang H, Ren H, Hu X, Wang X, Han C. AGEs and chronic subclinical inflammation in diabetes: disorders of immune system. *Diabetes Metab Res Rev*. 2015;31(2):127–37.
5. Gkogkolou P, Bohm M. Advanced glycation end products: key players in skin aging? *Dermatoendocrinol*. 2012;4(3):259–70.
6. Ko MJ, Chiu HC, Jee SH, Hu FC, Tseng CH. Postprandial blood glucose is associated with generalized pruritus in patients with type 2 diabetes. *Eur J Dermatol*. 2013;23(5):688–93.
7. Stander S, Darsow U, Mettang T, Gieler U, Maurer M, Stander H, et al. S2k guideline—chronic pruritus. *J Dtsch Dermatol Ges*. 2012;10(Suppl 4):S1–27.
8. Sun PC, Chen CS, Kuo CD, Lin HD, Chan RC, Kao MJ, et al. Impaired microvascular flow motion in subclinical diabetic feet with sudomotor dysfunction. *Microvasc Res*. 2012;83(2):243–8.
9. Seite S, Khemis A, Rougier A, Ortonne JP. Importance of treatment of skin xerosis in diabetes. *J Eur Acad Dermatol Venereol*. 2011;25(5):607–9.
10. Roslind S, Muhammed K, Kumar KS. Cutaneous manifestations in patients with type 2 diabetes mellitus and normal controls. *Journal of Skin and Sexually Transmitted Diseases*. 2020 Apr 17;2(1):26–30.
11. Malini DS, Sahu A, Mohapatro S, Tripathy RM. Assessment of risk factors for development of Type-II diabetes mellitus among working women in Berhampur, Orissa. *Indian journal of community medicine: official publication of Indian Association of Preventive & Social Medicine*. 2009 Jul;34(3):232.
12. Azizian Z, Behrangi E, Hasheminasabzavareh R, Kazemlo H, Esmaeeli R, Hassani P. Prevalence study of dermatologic manifestations among diabetic patients. *Advances in preventive medicine*. 2019 Jul 1;2019.
13. Ramachandran A, Snehalatha C, Latha E, Vijay V, Viswanathan M. Rising prevalence of NIDDM in urban population of India. *Diabetologia*. 1997;40:232–7.