



## A PROSPECTIVE STUDY OF SKIN MANIFESTATIONS IN TYPE 2 DIABETES MELLITUS

### Medicine

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### ABSTRACT

**Background:** Patients with type 2 diabetes mellitus (T2DM) often accompanied with skin related disorders. The skin manifestations in diabetes mellitus can vary from minor to lifethreatening.

**Aims and objectives:** To evaluate skin manifestation in T2DM patients.

**Materials and Methods:** Hundred T2DM patients were studied at Sharma Hospital, Gwalior from July 2017 to December 2017.

**Results:** Among all cutaneous infections fungal infections were most common (24.6%), followed by xerosis (32.3%) and acrochordons (16.5%). Patients with poor glycemic control had higher percentage of skin manifestation.

**Conclusion:** The prevalence of skin related manifestation are high among the T2DM patients. Patients having poor glycemic control had more skin manifestation. Early recognition and treatment of the skin conditions and adequate metabolic control can decrease the associated morbidities.

### KEYWORDS

Acrochordons, Fungal Infections, T2dm, Xerosis

### INTRODUCTION

Type 2 diabetes mellitus is a chronic metabolic disorder which is characterized by increased fasting and post prandial glucose levels. A several type of multisystem complications are often associated with T2DM.<sup>1</sup> Patients with T2DM has variable degrees of insulin resistance, impaired insulin secretion, and increased glucose production.<sup>2</sup>

Skin manifestation are often seen in patients with T2DM. In most of the patients skin manifestation's are often seen following the diagnosis of diabetes and in some it is the initial sign of onset of diabetes.<sup>3,4</sup>

The skin manifestations in diabetes mellitus can vary from minor to lifethreatening.<sup>2</sup> Abnormalities in carbohydrate metabolism, alteration in other metabolic pathways, vascular abnormalities such as microangiopathy, atherosclerosis, neuronal degeneration, and impaired host mechanisms leads to the development of skin manifestation's.<sup>3</sup>

Hence in present study we tried to evaluate the skin manifestation in T2DM patients of Northern region of India.

### MATERIALS AND METHODS

Present hospital-based case-control study was performed on 100 T2DM diabetes at Sharma Hospital, Gwalior from July 2017 to December 2017.

A total 100 T2DM patients with skin manifestation were enrolled. Patients with type 1 diabetes mellitus, gestational diabetes, HIV, malignancies, those on dialysis, immunosuppressed drugs and those not consenting to participate in the study were excluded from the study.

Study cohort was with glycosylated hemoglobin (HbA1c) <7% were placed under the good control group, and those with HbA1c ≥8% were placed under the poor control group.

A thorough physical examination along with local examination of lesions, complete blood picture, fasting blood sugar, postprandial blood sugar, and HbA1c were done in all the patients. Complication were detected with the help of Serum lipid profile, serum creatinine and fundus examination. Necessary microbiological and Histopathological investigations were done wherever necessary to confirm the clinical diagnosis.

All the data analysis was performed using IBM SPSS ver. 20 software. Quantitative data was expressed as mean ± standard deviation (SD) whereas categorical data was expressed as percentage. Cross tabulation and frequency distribution was used to prepare the table and Microsoft excel 2010 was used to prepare the required graph. Level of significance was assessed at 5% level.

### RESULTS

Out of 100 T2DM patients, 68% were male and 32% were female. Maximum T2DM patients belong to age group of 50-60 years (38%) of

age with mean age of 54.2±12.42 years. A total 32.42% patient had a family history of diabetes mellitus. Mean duration of diabetes mellitus in present study was 6.2±2.34 years. Out of 100 patients, 68.34% had poorly controlled diabetes and 29.8% had good diabetes control.

**TABLE 1: Showing frequencies of the common skin manifestations in study cohort**

Skin manifestations	Percentage
Fungal infection	24.6
Bacterial infection	7.8
Viral infection	3.2
Parasitic infestation	3.4
Xerosis	32.3
Acrochordons	16.5
Acanthosis nigricans	4.8
Psoriasis	3.1
Lichen planus	0
Vitiligo	1.2
Pruritus	2.8
Onychodystrophy	0.8
Eczemas	34.7
Seborrheic keratosis	13.2
Idiopathic guttate hypomelanosis	13.4
Cherry angioma	12.8

### DISCUSSION

In a patients of T2DM skin related disorder are frequently seen. These skin manifestations are often a signal for the onset of the disorder. It is very important to have a good glycemic control as without this skin manifestations are often intractable. In present study maximum patients had diabetes duration of 5 years or more. Reports have shown that increase in diabetes duration increases nonenzymatic glycosylation of dermal collagen and mucopolysaccharides which lead to different skin related disorders.<sup>5</sup> Study done by Yosipovitch et al and Sawhney et al showed that maximum patients having skin lesions were having poor glycemic control.<sup>6,7</sup> The results of both these studies are in agreement with the present study findings where maximum patients had poor glycemic control. Uncontrolled diabetes predispose the skin to multiple infections hence increases the development of neurovascular and other systemic complications which further increases dermatological manifestations.<sup>8</sup>

In present study around 25% of the patients had fungal infection this may be due to decreased resistance of the body. In the present study, xerosis was the most common noninfectious skin manifestation associated with diabetes mellitus followed by acrochordons. Formation of advanced glycation products in stratum corneum and autonomic neuropathy in diabetes patients are linked to the

pathogenesis of xerosis. Insulin resistance and formation of insulin like growth factors in diabetes patients are the possible cause of the higher percentage of acrochordons in present study.<sup>9</sup>

The percentage of patients of acanthosisnigricans in present study was similar to the reports of previous Indian studies.<sup>5,10</sup> Acanthosisnigricans is also reported as one of the risk factor for the development of T2DM. Possible mechanism for the development of acanthosisnigricans raised levels of insulin act on insulin-like growth factor receptors.<sup>11</sup>

Risk of development of infection increases in the presence of pruritus; which can cause excoriations on the skin. Few oral hypoglycemic agents, dry skin which is exacerbated with advancing age are possible reason in the pathogenesis of diabetic pruritus.<sup>12</sup> Seborrheic keratosis was another most common skin manifestation in present study. Study done by Ragunatha et al also reported a similar prevalence of seborrheic keratosis.<sup>13</sup>

Small sample size was the main limitation of the present study; a large randomized clinical trial is required to strengthen the present study findings.

## CONCLUSION

The prevalence of skin related manifestation were high among the T2DM patients in present study. Patients having poor glycemic control had more skin manifestation. In most of the cases skin manifestation usually develop following the diagnosis of diabetes but in some skin manifestations are presented as the first sign. Hence it could help in the early diagnosis of diabetes mellitus.

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