

**Original article:**

## Clinical Profile of Cutaneous Manifestation in Diabetes

Shekhar Pradhan<sup>1</sup>, Umesh Bhoi<sup>2</sup>

<sup>1</sup>Associate Professor, Department of Dermatology, Government Medical College, Miraj, Maharashtra, India.

<sup>2</sup>Associate Professor, Department of Dermatology, RCSM Government Medical College, Kolhapur, Maharashtra, India.

Corresponding Author: Dr. Umesh Bhoi, Flat no. 403, Khadilkar Sankul, hadilkar Galli, Gaonbhag, Sangli, Maharashtra, India. E-mail: drumeshbhoi@gmail.com

Date of submission: 06 Jan 2015, Date of acceptance: 21 Feb 2015

---

### Abstract

**Background:** Diabetes mellitus is a metabolic disorder characterized by elevated fasting and postprandial blood glucose levels and a variety of multisystem complications. Nearly all patients with diabetes have cutaneous findings related to their condition. Some diabetes-associated skin conditions are a direct result of the related metabolic changes such as hyperglycemia and hyperlipidemia. Progressive damage to the vascular, neurologic, or immune systems also contributes significantly to skin manifestations. Diabetes mellitus (DM) is a major cause of morbidity and mortality.

**Aims:** The present study was conducted to study the various coetaneous manifestations in patients of controlled or uncontrolled diabetes patients attending or admitted in the tertiary hospital and to correlate the various parameters.

**Materials and Methods:** A total number of 75 diabetic patients both male and females were included in the present study that were attending the dermatology OPD or admitted in medicine wards in a tertiary care institute.

**Results:** Out of total 75 patients 44(58%) were male patients while 31 (41%) female patients were present. Male to female patient ratio in our study was 1.4:1 with male preponderance. In age wise distribution maximum patients were in the age group of 31 to 40 years and 41 to 50 years with 19 (25%) and 49 (65%) cases respectively. Regarding the duration of diabetes 59% had diabetes for less than 5 years, 23% had illness up to 10 years. Among the skin conditions specific to diabetes were cutaneous infections 46% (n=34), acrochordans in 21% (n=16), acanthosisnigricans in 18% (n=14) of patients. Xerosis dryness of the skin was one of the common presentations seen in 42 (56%) cases. Pruritus was one of the common complaints 27% among the diabetic patients. Among the various cutaneous infections fungal infections was seen in 21 cases. Cutaneous bacterial infections were seen in 12 cases and one case of herpes zoster.

**Key words:** Diabetes, Glycemic Control, Acrochordans, Acanthosis Nigricans.

---

### Introduction:

Diabetes mellitus (DM) is the most common endocrine disorder. It exhibits a variety of multisystem complications involving the blood vessels, skin, eye, kidney, and the nervous system during the course of the disease process.<sup>1</sup>Tight glycemic control may have a beneficial effect on a subset of skin-related, diabetes associated disorders, but evidence is generally lacking. A fasting blood

glucose level of  $\geq 126$  mg/dL or a random value of  $\geq 200$  mg/dL on two separate occasions confirms the diagnosis of diabetes. Diabetes may also now be diagnosed with anHbA1c level  $\geq 6.5\%$ .<sup>2</sup>Nearly all patients with diabetes have cutaneous findings related to their condition Table no 1. Diabetes-associated skin conditions are a direct result of the related metabolic changes such as hyperglycemia and hyperlipidemia. Progressive damage to the vascular,

neurologic, or immune systems also contributes significantly to skin manifestations. The mechanisms

for other diabetes-associated skin conditions remain unknown.

Table 1: Cutaneous findings In Diabetes.<sup>2</sup>

<b>Cutaneous Findings In Diabetes</b>
Acanthosis nigricans
Limited joint mobility and scleroderma-like syndrome
Scleredema diabeticorum
Eruptive xanthomas
Bacterial infections (streptococcal, external otitis, necrotizing fasciitis)
Fungal infections (candidal, onychomycosis, mucormycosis)
Foot ulcers
Necrobiosis lipoidica
Granuloma annulare
Diabetic dermopathy
Acquired perforating disorders
Bullosis diabeticorum

Urbach<sup>3</sup> showed that skin sugar levels run parallel to the blood sugar levels. Krall and Zorilla<sup>4</sup> were able to identify diabetes by mere inspection of the skin and noting increased frequency of skin spots and red facies. Few authors have reported increased incidence of various types of bacterial and fungal infections in the diabetics and correlated it with the increased concentration of glucose in the skin which acted as a substrate for the growth of these organisms.<sup>5</sup> Gilgor and Lazarus observed that at least 30% of patients with diabetes mellitus have some type of cutaneous involvement during the course of their chronic disease.<sup>6</sup>

Cutaneous manifestations of diabetes are classified into four categories:<sup>7</sup>

**Skin lesions with strong-to-weak association with diabetes** (necrobiosis lipoidica, diabetic dermopathy, diabetic bullae, yellow skin, eruptive xanthomas,

perforating disorders, acanthosis nigricans, oral leucoplakia, lichen planus),

**Infections** (bacterial, fungal)

**Cutaneous manifestations of diabetic complications** (microangiopathy, macroangiopathy, neuropathy),

**Skin reactions to diabetic treatment**

(sulphonylureas or insulin).<sup>7</sup>

Increased levels of insulin act on insulin like growth factor (IGF) receptors, resulting in development of acanthosis nigricans.<sup>8</sup> Association between multiple acrochordons and DM has been reported.<sup>9</sup> Acrochordon has been regarded as a sign of impaired glucose tolerance, DM, and increased cardiovascular (atherogenic lipid profile) risk.<sup>10</sup>

Cutaneous infections are seen more frequently in type 2 DM.<sup>11</sup> Streptococcal, pseudomonas and candidal

infections are known to occur with increased frequency in DM.<sup>12</sup>

### **AIMS**

The present study was conducted to study the various cutaneous manifestations in patients of controlled or uncontrolled diabetes patients attending or admitted in the tertiary hospital and to correlate the various parameters.

### **MATERIALS AND METHODS**

Total number of 75 diabetic patients both male and females were included in the present study that were attending the dermatology OPD or admitted in medicine wards in a tertiary care institute were randomly selected. Detailed history and dermatological findings were noted and recorded in the standard proforma. The fasting or random blood sugar of the patients was noted. If the HbA1c reports were available they were also noted. Whenever it was necessary certain investigations like biopsy of the skin lesions was done for confirmation. Along with it culture, KOH mounts, Gram stain, Tzanck smear was performed wherever required.

### **RESULTS**

Total 75 patients who were known diabetic or newly diagnosed diabetic patients were randomly enrolled in our study. These patients were examined and detailed clinical examination was noted. Out of total 75 patients 44(58%) were male patients while 31 (41%) female patients were present. Male to female patient ratio in our study was 1.4:1 with male preponderance. In age wise distribution maximum patients were in the age group of 31 to 40 and 41 to 50 with 19 (25%) and 49 (65%) cases respectively. Regarding the duration of diabetes 59% (n=44) had diabetes for less than 5 years, 23% (n=17) had illness up to 10 years. All the patients were among the type

II diabetes on oral hypoglycemic drugs and few were on injectable insulin with poor glycemic control.

Associated systemic diseases such as hypertension in 11 cases, ischemic heart disease in 5 cases, peripheral neuropathy in 14 cases, hypothyroidism in 1 case, hemiparesis 1 case were seen.

Among the skin conditions specific to diabetes were cutaneous infections 46% (n=34), acrochordans in 21% (n=16), acanthosis nigricans in 18% (n=14), seborrheic keratoses in 19% of cases.

Xerosis dryness of the skin was one of the common presentations seen in 42(56%) cases.

Pruritus was one of the common complaints among 27% of the diabetic patients.

Among the various cutaneous infections fungal infections were seen in 21 cases. Among the fungal infections tinea cruris was observed in 9, tinea corporis in 7, candidal balanoposthitis in 9, onychomycosis in 2 and candidal vulvovaginitis in 6 cases.

Cutaneous bacterial infections were seen in 12 cases and one case of herpes zoster over the chest wall was observed. Boils and the furuncles were the common presentations seen in cutaneous bacterial infections.

Prurigo simplex seen in 2 cases, localized vitiligo in 3 cases, lichen planus in 2 cases, macular amyloidosis in 1 case, granuloma annulare 1 case and asteatotic eczema in 5 cases.

### **DISCUSSION**

Various cutaneous disorders are related to diabetic complications such as microangiopathy (diabetic dermopathy), neuropathy (diabetic foot), immunologic dysfunction (infections), insulin resistance (acanthosis nigricans), and abnormal lipid metabolism (xanthoma).<sup>8</sup> Cutaneous signs of diabetes mellitus are extremely valuable to the clinician. They generally appear after the primary disease has developed but may signal or appear coincidentally

with its onset.<sup>13</sup>In our study, the most common skin disorders were xerosis (56%), skin tags (21%), cutaneous infections (46%), pruritus (27%) and seborrheic keratosis 19% respectively. Our findings were quite similar to the studies done by Goyal, et al.<sup>13</sup> which had xerosis (44%), acrochordon (32%), cutaneous infections (31%), and pruritus and seborrheic keratosis –30% each. Skin tags were seen in 21% of patients. Skin tags may serve as a marker for diabetes mellitus as was concluded by Thappa et al.<sup>14</sup> Acanthosis nigricans and acrochordon,

manifestations of insulin resistance which may be present before the expression of DM, were the predominant dermatoses with known pathogenesis. Increased levels of insulin act on insulin like growth factor (IGF) receptors, resulting in development of acanthosis nigricans.<sup>8</sup>

We conclude that the skin involvement in diabetes is quite often. The manifestations are numerous and varied and many a times they can serve as diagnostic marker for underlying diabetes.

## REFERENCES

1. Mahajan S, Koranne R V, Sharma S K. Cutaneous manifestation of diabetes mellitus. *Indian J Dermatol Venereol Leprol* 2003;69:105-8.
2. Andrea A. Kalus, Andy J. Chien, *Diabetes Mellitus and Other Endocrine Diseases*, Fitzpatrick's Dermatology in General Medicine, eighth edition, 2012, 151:1840-1868.
3. Urbach E. Skin diabetes (hyperglycidermia) without hyperglycemia, *JAMA*, 1945;129:433.
4. Krall LP Zorilla E. Disorders of skin in diabetes, *Joslin's Diabetes Mellitus*, Lecs & Febiger Philadelphia, 1971, 653.
5. Urbach K, Lentz JW. Carbohydrate metabolism and the skin, *Arch Dermatol Syphilol*, 1965; 52: 301 - 304.
6. Giligor RS, Lazarus G S. Skin manifestations of diabetes mellitus. In, *Diabetes Mellitus*, eds Rifkin H, Raskin P, Brady co, Louana 1981, 313-321.
7. Romano G, Moretti G et al. Skin lesions in diabetes mellitus: Prevalence and clinical correlations. *Diabetes Res Clin Pract* 1998;39:101-6.
8. 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. New York: McGrawHill Medical; 2008. p. 1461-84.
9. Kahana M, Grossman E, Feinstein A, Ronnen M, Cohen M, Millet MS. Skin tags: A cutaneous marker for diabetes mellitus. *Acta Derm Venereol* 1987;67:175-7.
10. Crook MA. Skin tags and atherogenic lipid profile. *J Clin Pathol* 2000;53:873-4.
11. Ferringer T, Miller F. Cutaneous manifestations of diabetes mellitus. *Dermatol Clin* 2002;20:483-92.
12. Joshi N, Caputo GM, Weitekamp MR, Karchmer AW. Infections in patients with diabetes mellitus. *N Engl J Med* 1999; 341:1906-12.
13. Goyal, et al.: Pattern of skin lesions in diabetics of Western Himalayas, *Indian J Dermatol* 2010; 55(1).
14. Thappa DM. Skin tags as markers of diabetes mellitus: An epidemiological study in India. *J Dermatol* 1995; 22:729-31.