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## To assess skin changes in diabetes mellitus patients: A clinical study

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### Abstract

**Background:** Diabetes mellitus (DM) is a metabolic disease characterized by relative or absolute insulin deficiency. The present study was conducted to assess skin changes in diabetes mellitus patients.

**Materials & Methods:** The present study was conducted on 148 patients of type 2 diabetes mellitus of both genders. Diabetes was diagnosed based on symptom of DM and random plasma glucose  $\geq 200$  mg/dl or fasting blood sugar (8 hours)  $\geq 126$  mg/dl or 2 hours plasma glucose (75 mg)  $\geq 200$  mg/dl during an oral glucose tolerance test. A careful clinical examination was performed and skin lesions were also recorded.

**Results:** Out of 148 patients, males were 78 and females were 70. Patients had dermatopathy in 12, diabetic foot in 20, pruritis in 34, vitiligo in 15, lichen planus in 17, psoriasis in 6 and maculopapular rash in 39. The difference was significant ( $P < 0.05$ ).

**Conclusion:** Common skin lesions in patients with diabetes mellitus were dermatopathy, diabetic foot, pruritis, vitiligo, lichen planus, psoriasis and maculopapular rash.

**Keywords:** diabetes mellitus, lichen planus, skin lesions

### Introduction

Diabetes mellitus (DM) is a metabolic disease characterized by relative or absolute insulin deficiency. The metabolic abnormality in DM results in gross defect in protein, carbohydrate and fat metabolism. Presently DM affects individuals of all ages and in all socio economic segments of the population. The International Diabetes Federation (IDF) estimated the total number of diabetic subjects to be around 40.9 million in India and this is further set to raise to 69.9 million by the year 2025. WHO suggests that the number of diabetic subjects would increase to 80 million by the year 2030 in India. Skin lesions are frequently observed in diabetic patients and about 30% of diabetics have cutaneous disorders.

Type 2 diabetes mellitus was once called adult-onset diabetes. Now, because of the epidemic of obesity and inactivity in children, type 2 diabetes mellitus is occurring at younger and younger ages. Although type 2 diabetes mellitus typically affects individuals older than 40 years, it has been diagnosed in children as young as 2 years of age who have a family history of diabetes.

Type 2 diabetes is characterized by peripheral insulin resistance with an insulin-secretory defect that varies in severity. For type 2 diabetes mellitus to develop, both defects must exist: all overweight individuals have insulin resistance, but only those with an inability to increase beta-cell production of insulin develop diabetes. In the progression from normal glucose tolerance to abnormal glucose tolerance, postprandial glucose levels first increase. Eventually, fasting hyperglycemia develops as inhibition of hepatic gluconeogenesis declines. The present study was conducted to assess skin changes in diabetes mellitus patients.

### Materials & Methods

The present study was conducted in the department of Dermatology. It comprised of 148 patients of type 2 diabetes mellitus of both genders. The study was approved from institutional ethical committee. All participants were informed regarding the study and written consent was obtained. Information such as name, age, gender etc. was recorded.

Diabetes was diagnosed based on symptom of DM and random plasma glucose  $\geq 200$  mg/dl or fasting blood sugar (8 hours)  $\geq 126$  mg/dl or 2 hours plasma glucose (75 mg)  $\geq 200$  mg/dl

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during an oral glucose tolerance test. A careful clinical examination was performed and skin lesions were also recorded. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

## Results

**Table I:** Distribution of participants

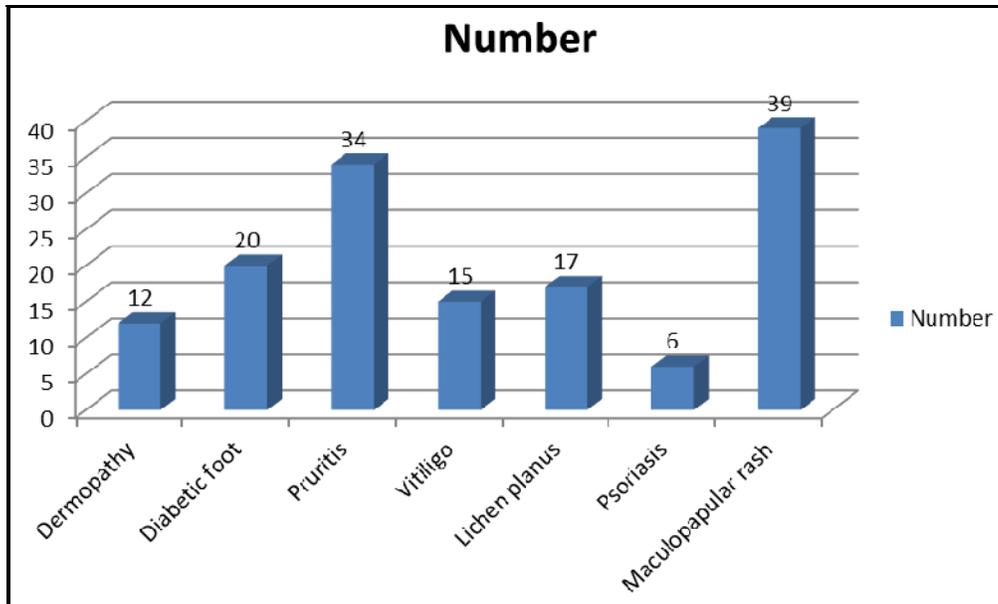
Total- 148		
Gender	Males	Females
Number	78	70

Table I shows that out of 148 patients, males were 78 and females were 70.

**Table II:** Occurrence of skin lesions in patients

Lesions	Number	P value
Dermopathy	12	0.01
Diabetic foot	20	
Pruritis	34	
Vitiligo	15	
Lichen planus	17	
Psoriasis	6	
Maculopapular rash	39	

Table II, graph I shows that patients had dermatopathy in 12, diabetic foot in 20, pruritis in 34, vitiligo in 15, lichen planus in 17, psoriasis in 6 and maculopapular rash in 39. The difference was significant ( $P < 0.05$ ).



**Graph I:** Occurrence of skin lesions in patients

## Discussion

There are many proposed patho-mechanism for skin involvement in DM, which includes abnormal carbohydrate metabolism, other altered metabolic pathways, atherosclerosis, microangiopathy, neuron degeneration and impaired host immune mechanism. Some studies revealed the correlation of skin manifestation of DM with microangiopathic complications [8]. The present study was conducted to assess skin changes in diabetes mellitus patients.

In this study, out of 148 patients, males were 78 and females were 70. Patients had dermatopathy in 12, diabetic foot in 20, pruritis in 34, vitiligo in 15, lichen planus in 17, psoriasis in 6 and maculopapular rash in 39. The prevalence of different types of skin changes varies considerably in different studies. A study revealed that infectious complications are most common complications. Fungal infection was the most common infectious complication. Among the other complications, 2(2.27%) had xanthelasma palpebrarum, 1(1.14%) had pruritus without any skin lesions, 2 patients had diabetic dermatopathy and 1(1.14%) had diabetic bulla. Polyneuropathy and diabetic ulcer was noted in one patient each. Miscellaneous conditions like vitiligo, lichen planus, drug reactions, lichen simplex, pustular bacterid, atopic dermatitis, eczema, psoriasis, skin tag and pemphigus vulgaris were noted in 20 patients altogether. Pruritus was

the most common skin symptom [9].

The major risk factors for type 2 diabetes mellitus are the following age - Older than 45 years, obesity with weight greater than 120% of desirable body weight, family history of type 2 diabetes in a first-degree relative, hispanic, Native American, African American, Asian American, or Pacific Islander descent, history of previous impaired glucose tolerance (IGT) or impaired fasting glucose (IFG), hypertension (>140/90 mm Hg) or dyslipidemia (high-density lipoprotein [HDL] cholesterol level <40 mg/dL or triglyceride level >150 mg/dL), history of GDM or of delivering a baby with a birth weight of >9 lb and polycystic ovarian syndrome [10].

Ghosh *et al.* [11] conducted a study in which sixty (n = 60) diabetes patients (Type 1 DM, 9 patients and Type 2 DM 51 patients) have been found to have various skin lesions. 31 (51.67%) patients presented with infectious conditions, vascular complications were present in 21 (35%) and dermatomes belonging to the miscellaneous group were present in 50 (83.33%) patients. Pyoderma, diabetic dermatopathy, and pruritus without skin lesions were found to be most common manifestations in infective, vascular and miscellaneous group, respectively. Higher level of HB1AC was found in patient with diabetic bulla (10.5), scleredema (9.7), lichen planus (9.3), and acanthosis nigricans (9.15). Patients with psoriasis and vitiligo had statistically

significant lower level of glycosylated hemoglobin. However, no association of any kind of skin manifestation with DM with other microangiopathic complications was found in the study.

Ragunatha *et al.* [12] found signs of insulin resistance, acrochordon (26.2%), and acanthosis nigricans (5%) as the most common presentation in 500 Indian diabetic cohorts. Microangiopathic complications with skin lesions were not documented in any large-scale studies. Skin and soft tissue infections, sensory neuropathy, atherosclerotic vascular disease, and hyperglycemia all predispose patients with diabetes to skin and soft tissue infections. These can affect any skin surface but most commonly involve the feet.

### Conclusion

Common skin lesions in patients with diabetes mellitus were dermatopathy, diabetic foot, pruritis, vitiligo, lichen planus, psoriasis and maculopapular rash.

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