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ORIGINAL ARTICLE

A CLINICAL STUDY OF MUCOCUTANEOUS MANIFESTATIONS OF DIABETES MELLITUS

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ABSTRACT: BACKGROUND AND OBJECTIVES: It is a well-known fact that the skin is referred to as the mirror of the internal diseases. This study has undertaken with the objectives of knowing the spectrum of mucocutaneous manifestations in diabetes mellitus. **METHODS:** A total of 100 patients with dermatological manifestation were included in the study. Relevant investigation for the diagnosis of diabetes and dermatological disorders were done. **RESULTS:** Majority of the cases belonged to the age group 41-60 years. Various dermatoses observed in the patients were fungal, bacterial and viral infections, lichen planus, vitiligo, diabetic bullae and diabetic dermopathy, granuloma annulare, among the various cutaneous manifestations. Thirty four patients had associated systemic illness, hypertension being most commonly observed. **INTERPRETATION AND CONCLUSION:** A diabetic patient can present with both specific and non-specific dermatological manifestations. Thus a patient presenting with mucocutaneous manifestations in the absence of primary cutaneous disorders should be investigated for the underlying diabetic status.
KEYWORDS: Diabetes; mucocutaneous Manifestations.

INTRODUCTION: Skin is the largest and the most visible organ of the body. It is referred to as window or mirror to the body. Diabetes mellitus (DM) is a worldwide problem and the most common endocrine disorder. Its prevalence is increasing in the present scenario of a sedentary life style in the general population. Abnormalities of insulin and elevated blood glucose level lead to metabolic, vascular, neurological and immunological abnormalities. Affected organs include the cardiovascular, renal and nervous systems, eyes and the skin.

The skin is affected by both the acute metabolic derangements and the chronic degenerative complications of diabetes. Although the mechanism for many diabetes associated skin conditions remains unknown, the pathogenesis of others is linked to abnormal carbohydrate metabolism, other altered metabolic pathways, atherosclerosis, microangiopathy, neuron degeneration and impaired host mechanisms.

Skin manifestations can be the first presenting sign of diabetes but more often appear in known diabetic patients during the course of the disease. As observed in 30–71% of diabetic patients. The mucocutaneous manifestations of DM are well known and considered common. This study is an attempt to analyze the patter of mucocutaneous manifestations of diabetes in view of the increasing prevalence of diabetes in the present scenario lifestyle in the general population.

OBJECTIVES:

Primary Objective: To study the clinical pattern of mucocutaneous manifestations in patients of Diabetes Mellitus.

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Secondary Objectives:

1) To study the relation of these mucocutaneous manifestations with demographic data like age, sex and duration of Diabetes.
2) To compare the mucocutaneous manifestations in controlled and uncontrolled Diabetes.

METHODOLOGY:

STUDY POPULATION: This study consisted of 100 cases of Type 1 and Type 2 Diabetes Mellitus with mucocutaneous manifestations attending Dermatology OPD KIMS Hospital, Bangalore, for a period of 18 months**.**

Inclusion Criteria: All confirmed (old and new) cases of Diabetes Mellitus with mucocutaneous manifestations irrespective of age, sex, duration of illness and associated diseases, willing to participate in the study.

Exclusion Criteria:

1) Patient who are in terminal illness.
2) Patients not willing to participate in the study.

Ethical clearance was obtained. In the selected patients, a detailed history with particular reference to demographic details, family history of similar complaints and of DM, duration of DM treatment details, duration of various symptoms and evolution of lesions was taken.

The patients were clinically examined in good light, for various mucocutaneous manifestations of DM such as skin lesions, nail changes, mucous membrane involvement.

Following Investigations were done in all the Patients:

1) Routine haematological and urine investigations such as Hb%, TC, DC, ESR, RBS, urine routine and microscopy were done in all patients.
2) Fasting blood sugar (FBS), random blood sugar (RBS).
3) Glycosylated (glycated) haemoglobin (HbA1c).
4) Investigations done to diagnose mucocutaneous manifestations associated with DM.
   a. Potassium hydroxide mount.
   b. Gram staining.
   c. Bacterial and Fungal culture.
   d. Skin biopsy.
5) **Mycological Examination:** The specimens from various sites were collected as follows:
   Skin: Skin material was scraped with the flat edge of a sterile scalpel blade from the edge of the lesion in case of dermatophytosis.

a) **Potassium Hydroxide (KOH) Mount Preparation:**
   Skin and Mucous Membrane Lesions: For direct microscopic examination, a small amount of specimen was spread over the centre of a glass slide and a drop of 10% KOH was added and a cover slip was placed on it. Slide was slightly warmed by passing over a naked flame and after the material softened, gentle pressure was applied over the cover slip to force out any trapped air and to facilitate thinning of the specimen. Examination was conducted first under low power and then under high power objective.

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Nails: In case of nail specimens, 40% KOH was first taken in a small test tube, nail clippings were introduced and kept overnight for dissolving the nail keratin. The specimen was then examined under the low and high power objective.

In both cases, attempt was made to identify the oval budding yeasts of pseudohyphae showing regular points of constriction, resembling lengths of sausages, suggestive of candida or long septate hyphae with branching for dermatophytosis.

b) **Gram Stain: (i) Candida. (ii) Bacterial Infections:**

One of the swabs containing the specimen was used to prepare smear on a clean glass slide. It was stained by Gram's Method. The smear was prepared on a glass slide and was fixed by gently passing over the flame of a spirit lamp. Then it was stained with gentian violet for one minute and Gram's iodine was added and kept for another one minute. Then it was washed with water and decolorized with alcohol or acetone for 10-30 seconds. After washing again with water, it was counterstained with safranin or carbol fuschin for 20-30 seconds. The stained smears were examined under the microscope using oil immersion lens. The bacterial types, their arrangement and staining characteristics were noted.

c) **Culture:**

Bacterial: The specimen from the other swab was inoculated on to the blood agar and Mac Conkey's agar media. The media were then incubated at 37°C aerobically for 18-24 hours. The organisms were identified on the basis of colonial morphology and biochemical characteristics. Antibiotic sensitivity was done using disk diffusion method on Muller Hinton agar. The zone size was measured and interpreted as per standard methods.

Fungal: The culture medium used was the Sabouraud's Dextrose Agar (SDA), with a pH of 5.6, supplemented with antibiotics like chloramphenicol and gentamycin to prevent bacterial overgrowth. Freshly collected specimens were inoculated onto two tubes of SDA, and were incubated.

In candida species, the growth appears in 3 to 4 days as cream coloured, smooth and pasty colonies.

d) **Skin Biopsy:** Skin biopsy was performed for dermatoses such as lichen planus, diabetic dermopathy, diabetic bullae and psoriasis.

Procedure: After an informed consent, thorough cleaning of biopsy site was done using 70% alcohol. The area was then anaesthetized by infiltrating 2% lignocaine subcutaneously. A round body skin biopsy punch was held vertically and twisted as it descends vertically through the dermis and subcutis. The punch was then slowly withdrawn and specimen was elevated and cut at its base. This was transferred to 10% formalin for histopathological examination.

RESULTS:

1. **Sex distribution of Patients:** Among 100 patients studied 50 (50%) were males and 50(50%) were females. The male to female ratio was 1:1.

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2. **Age Distribution of the Patients:** peak prevalence was seen in the age group of41 -60 years that is 46%.Among 100 patients studied,33 patients were under the age group of 61-80 years (33%), 11 patient were under 20-40 years (11%), 10 patient were above 80 years.
3. **Occupational Status:** Majority of the patients were housewives (49%), followed by Un employee (18%), private employee and agriculturist (13%) each, govt. employee (4%), Retired govt. employee (3%).
4. **Family history of Diabeties:** Among 100 patients, 68 (68%) of them had a family history of diabetes mellitus., 32% patients gave a negative family history.
5. **Resident of Patients on Geographical Location:** In the present study of 100 patients, 16% were from rural, 84% were from urban area.
6. **Type of Diabetes Mellitus:** Majority of the patients in our study had Type II diabetes (98%), while Type I diabetes was seen in 2% of the patients.
7. **HbA1c Levels:** Majority of the patients (63%) had a poor control of diabetes with HbA1c levels >8%, followed by 22% who had a moderate control of diabetes.
8. **Bacterial Infection:** Among the 100 diabetic patients, 12 had bacterial infections of which the most commonly observed were cases of cellulitis 50.0%, followed by furuncle 33.33%, folliculitis and carbuncle 8.33% each.
9. **Viral Infections:** 5 patients with viral infections, 1 (20%) patients had verruca vulgaris and 4 patients (80%) were diagnosed to have herpes zoster.
10. **Fungal Infections:** Out of the 100 patients studied, 26 had fungal infections of which most commonly observed was tinea cruris seen in 10 patients (38.46%), followed by Tinea pedies (19.23%), 4 patients each had tinea corporis (15.38%) and Pityriasis versicolor (15.38%), 1 cases each (3.84%) had onychomycosis, Candidial vulvovaginitis and candidialbalano-posthitis,.
11. **Cutaneous Infections:** Amongst the 43 patients with cutaneous infections, majority had fungal infections (26%), followed by bacterial infections (12%) and viral infections (5%).
12. **Duration of Diabetes:** 43% of the patients studied had diabetes ranging from 10-19 years, followed by 38% patients between 1-9 years, 13% between 20-30 years, and 1 more than 30 years.
13. **Systemic Disease:** Hypertension was the most commonly associated systemic illness seen in 25% patients, followed by Hypothyroidism 3%. Some of the patients had more than one associated systemic illness.
14. **Systemic Association of Diabetes:** Among 100 patients with mucocutaneous manifestations, 34% patients were associated systemic condition, remening 66% were without systemic association.
15. **Metabolic Conditions:** 2 patients (2%) presented with Xanthelasma palpebrerum.
16. **Dermatoses Commonly Associated with DM:** Among the various dermatoses studied, majority presented with generalized pruritus 7 patients (7%), followed by psoriasis and lichen planus 3 cases each, 1 case each (1%) of macular amyloidosis and vitiligo.
17. **Non-specific Manifestations:** the most common non-specific manifestation observed is PV in 3 patients, followed by each case of Bullous pemphigoid, scabies and Hansen.
18. **Dermatoses Associated with Neuropathy:** 2 patients had diabetic foot.

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19. **Dermatoses Associated with Microangiopathy:** Out of 100 patients studied, one of each patients had Diabetic dermopathy (DD), Granuloma annulare (GA) and diabetic bullae respectively.

DISCUSSION:

1) Sex Distribution: In this study, ratio of male diabetics and females diabetics is (50 vs 50%), but male diabetics were prone for mucocutenous involvement by Sawhney et al,[1] Rao et al[2] and Al-Mutairi et al.[3]

Mahajan et al,[4] Bhat et al[5] and Nigam et al[6] reported that female diabetic patients had significantly higher incidence of mucocutaneous manifestations.

2) Age Distribution: In this study of 100 patients of DM with mucocutaneous manifestations, majority belonged to 41-60 years with 46%.

The frequencies of patients with mucocutaneous manifestations in the 20-40 years (11%), 61-80 years (33%), and 10 patient were above 80 years respectively.

Similar frequencies were reported by various studies carried out by Mahajan et al,[4] Sawhney et al[1] and Nigam et al,[6] which are well in accordance with the above frequencies.

The relative increase in the incidence of mucocutaneous involvement with age in diabetic patients may be attributed merely to the decreased resistance of body as well as long duration of diabetes in these patients.

3) Type of Diabetes Mellitus: Non-insulin dependent diabetes mellitus (type 2 DM) was most commonly observed (98%) as compared to Insulin dependent diabetes mellitus (type 1 DM) (2%).

This reflects the general distribution pattern of type 1 and type 2 DM cases in world population. No difference in the prevalence of mucocutaneous disorders between type 1 and type 2 DM patients has been noted.[3,5]

Similar observations of type 2 diabetes being more common was observed in studies conducted by Mahajan et al[4] (98%), Sawhney et al[1] (80%), Bhat et al[5] (97.7%), Nigam et al[6] (82.1%) and Al-Mutairi et al[3] (93%). Thus the present study values are well in accordance with the above mentioned studies.

4) Family History: In this study, a positive family history of diabetes mellitus was obtained in 32 patients (32%), while 68 patients (68%) gave a negative family history.

5) Occupation History: Majority of the patients were housewives (49%), followed by unemployee (18%), private employee and agricularist (13%), govt. employee (4%), Retired govt. employee (3%).

In the present study, majority were housewives probably because of the sedentary life style and lack of exercise, so also in unemployee people.

6) Geographical Location: In the present study of 100 patients, 16% were from rural, 84 % were from urban area.

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7) Duration of Diabetes: In this study, 43% of the patients had diabetes for a duration of 10-19 years and 38% patients for 1-9 years.

According to Bhatet al,[5] majority of diabetic patients with cutaneous manifestations had 1-5 years of duration of diabetes (37.37%), followed by 6-10 years (24.24%).

Rao et al[2] reported that majority of skin manifestations occurred within five years of diagnosis of diabetes.

As the duration of diabetes increases, there is non-enzymatic glycosylation of dermal collagen and mucopolysaccharides, leading to various cutaneous manifestations.[5]

Infections were more common during early diabetes, probably due to decrease in the host defense mechanism and decreased phagocytic activity, which is noticed immediately in uncontrolled diabetes.

Manifestations due to diabetic microangiopathies were seen in chronic diabetes because the deposition of PAS - positive material within the lumina of the blood vessels occurs slowly in the disease process.

8) Associated Systemic Illnesses: Of the 100 patients, 34 patients (34%) had associated systemic co-morbidity, such as hypertension in 25 patients (25%), According to Mahajan et al,[4] 53.1% patients were hypertensive. Similar frequencies were reported by Bhat et al[5] (46.46%), Al-Mutairi et al[3] (44%) and Nigam et al,[6] where in hypertension was the most common associated systemic disease.

Hypertension has been hypothesized to accelerate the process of microangiopathy in diabetics.[3]

9) Cutaneous Infections: Infections were the most common dermatoses (43%), of which fungal infections were most prevalent (26%), followed by bacterial infections (12%) and viral infections (5%).

This is in accordance with other studies where fungal infections were more common, as observed by Mahajanet al[4] (54.68%), Bhat et al [5](34.34%) and Al-Mutairi et al[3] (68%).

Fungal agents formed largest group of mucocutaneous lesions and it may be because most of our patients belonged to lower socio economic group residing in slum areas where hot and humid conditions, overcrowding and decreased resistance of the body predisposes the individuals for such infections.

Infections are usually common during early diabetes. This may be explained on the basis of decrease in the host defence mechanism, and decreased phagocytic activity, which is noticed immediately in uncontrolled diabetes and these changes do not require much longer time to develop unlike microangiopathy.[2]

10) Viral Infections: Five patients had viral infections, of which 4 (4%) had herpes zoster and 1 patients had (1%) verruca vulgaris.

In a study conducted by Mahajanet al,[4] two cases of herpes zoster were reported. Similar frequencies were observed by Bhatet al[5] and Al-Mutairi et al.[3]

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11) Fungal Infections: Of the 26 patients with fungal infections, majority had dermatophytoses of which 10 patients had tinea cruris, 4 had tinea corporis, 4 patients had tinea versicolar and 5 had Tinea pedies.

The various candidial infections observed were, candidial vulvovaginitis in 1 patient and Candidial balanoposthitis in 1 patient.

There were 1 patients of onychomycosis.

Fungal infections were the commonest infections in diabetics as reported by Mahajan et al[4] (21 cases), Rao et al[2] (59.42%) and Bhat et al[5] (28.18%)

Mahajan et al[4] found a higher prevalence of dermatophytoses in their study, while Bhat et al[5] and found a higher prevalence of candidial infections.

12) Bacterial Infections: Among the 12 patients of bacterial infections, 3 patients had furunculosis, 1 patients had folliculitis and cellulitis in 6 patients. One case (8.33%) of carbuncle.

Findings observed by Nigam et al, in which, out of 32 patients with bacterial infections, furunculosis was the commonest (15 cases), followed by folliculitis (8 cases), cellulitis (3 cases) and two cases each of carbuncle, bacterial impetigo and multiple abscesses.

13) Metabolic Conditions Affecting Diabetic Skin: 2 patients were observed with metabolic conditions. Both the patients had xanthelasmapalpebrerum (2%).

Rao et al[2] reported 2 cases of xanthelasmapalpebrerum, whereas Bhat et al[5] observed xanthelasmapalpebrerum in 4 cases.

14) With Systemic Association in Diabetes: Other associated systemic co-morbidity, such as hypertension was present in 25 patients and 1 patient with pulmonary tuberculosis, 3 with hypothyroidism and 1 with asthma.

According to Mahajan et al,[4] 53.1% patients were hypertensive. Similar frequencies were reported with Bhat et al[5] 46.46%, Al-Mutairi[3] 44%, Nigam et al[6] also reported hypertension being the most common associated systemic disease. Hypertension is known to accelerate progression of microangiopathy due to increased vascular leakage.

15) Dermatoses Associated with Microangiopathy: In the present study, 3 patients (3%) had dermatoses associated with microangiopathy, wherein 1 patients (1%) had diabetic dermopathy, 1 patient (1%) had diabetic bullae and 1 patient had granuloma annulare (GA).

Majority of the western studies report a high frequency of diabetic dermopathy (50%), as compared to 17.8% in Indian patients.

Nigam et al[6] reported 6 cases (3.5%) of diabetic dermopathy and 2 cases (1%) of diabetic bullae. Similarly, Mahajan et al,[4] in their study of 100 diabetics, found diabetic dermopathy in 6 patients and 2 cases of diabetic bullae.

While a comprehensive review on the subject considers diabetic dermopathy to be the most common manifestation, we did not observe it to be so common.

Skin manifestations due to diabetic microangiopathies are usually seen in chronic diabetes because the deposition of PAS-positive material with in the lumina of the blood vessels occurs slowly in the disease process.

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16) Diabetic Neuropathy: 2 patient of diabetic foot were observed.

Rao et al[2] in their study, observed 1 case of diabetic ulcer and 1 case of polyneuropathy. According to Mahajan et al,[4] Bhat et al,[5] Nigam et al,[6] Al-Mutairi et al[3] observed diabetic ulcer in the frequencies of 8, 4, 6, 2 cases respectively.

In the present study, only one case of diabetic ulcer was observed, which is well in accordance with Rao et al[2] study.

17) Disorders of Collagen: Our study did not report any diabetic patients with disorders of collagen.

18) Dermatoses more Commonly Associated with Diabetes: Among the various dermatoses studied, generalized pruritus was the most common seen in 7 patients (7%), followed by psoriasis and Lichen planus 3 cases each. One case each had vitiligo and macular amyloidosis.

The above mentioned dermatoses have been reported previously in studies conducted by Paronet al[7] and Al-Mutairi et al.[3]

A review by Jelinek et al questions the relationship between generalized itching and DM. It is believed that generalized itching, at least in some DM cases, cannot be readily explained by any other cause except by the underlying DM.[3]

Autonomic neuropathy or AGE of stratum corneum proteins has been attributed to the pathogenesis of xerosis and pruritus.[7]

An association between psoriasis and increased cardiovascular risk and metabolic syndrome has been reported.[7]

In a study by Nigam et al,[6] dermatoses associated with an increased incidence of DM, like vitiligo (4), lichen planus (2), acquired perforating dermatoses (3) were detected.

Certain dermatoses with underlying pathogenesis like vitiligo are known to occur in DM as a part of polyglandular autoimmune syndrome. Oral lichen planus has been suggested to occur with increased frequency in DM.[7] However, such an association was not noticed in several other studies, including the present one.

19) Non-specific Manifestations: 6 patients presented with non-specific manifestations, 3 of them had pemphigus, 1 case each of Bullous pemphigoid, scabies and hansens.

The occurrence of nonspecific mucocutaneous disorders also has pathogenetic, prognostic, and therapeutic importance in diabetic patients. The loss of cutaneous barrier in non-specific disorders predisposes already susceptible diabetic patients to chronic and recurrent infections.

Accelerated aging of the skin has been reported in patients with both types of DM, especially type I.

20) Hba1c Levels: Among the 100 diabetic patients with mucocutaneous manifestations, 22 patients (22%) had moderate control of DM with HbA1c levels in the range of 7.1%-8%, while 63 patients (63%) had a poor control of DM with HbA1c levels >8%.

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In a study conducted by Nigam et al,[6] uncontrolled diabetes was observed in 52% cases. The incidence of mucocutaneous diseases in patients with uncontrolled diabetes mellitus was 70.2% while it was only 51% in patients with controlled diabetes.

Studies conducted by Bhat et al,[5] Sawhney et al[1], Yosipovitch et al[8] also found majority of diabetic patients with skin lesions having uncontrolled diabetes.

Thus the present study is in accordance with the above mentioned studies.

Uncontrolled diabetes increases the risk of development of microangiopathy, related complications or sequelae[5] and predisposes skin for various infections.[6]

A study conducted by Raghunatha et al[7] showed well controlled diabetes in majority of the patients.

21) **Random Blood Sugar Levels:** Majority of the patients had random blood sugar levels in the range of 140-200mg/dl (49%), while 29 patients (29%) had blood sugar levels of >200mg/dl.

CONCLUSION: This study was undertaken to know the spectrum of mucocutaneous manifestations in diabetes mellitus.

Infections were the most common mucocutaneous manifestations in diabetics, followed by dermatoses most commonly associated with diabetes.

Mucocutaneous manifestations are more common in patients who have overall poor glycemic control which in turn is reflected by high HbA1c value.

Mucocutaneous manifestations can heighten the suspicion of a physician regarding the diagnosis of diabetes. This further helps to prevent systemic derangements by early institution of appropriate treatment.

Proper skin care and long-term control of blood glucose levels may reduce the risk of some of the skin lesions in diabetic subjects.

Thus, dermatologists can play an important role in reducing dermatologic morbidity, improvement of quality of life, and management strategy of diabetic patients.

Thus this study emphasizes on the importance about the knowledge of the various mucocutaneous manifestations of diabetes. “Skin manifestations may be the first clue to underlying diabetic condition.”

SUMMARY: The present study was undertaken to know the spectrum of mucocutaneous manifestations in diabetes mellitus. A total of 100 patients of diabetes mellitus with mucocutaneous manifestations were studied. The observations and results were tabulated and graphically represented; their significance was discussed after reviewing the available literature:

- Males constituted 50% of the cases and male to female ratio was 1:1.
- Majority belonged to age group between 41-60 years.
- Type 2 DM was most commonly observed (98%) as compared to Type 1 DM (2%).
- 32 patients had a positive family history of diabetes mellitus out of the 100 patients.
- Out of the 100 diabetic patients, 43(43%) patients had diabetes ranging from 10-19 years.
- Majority of the patients had RBS levels in the range of 140-200mg/dl (49%), while 29 patients (29%) had blood sugar levels of >200mg/dl.

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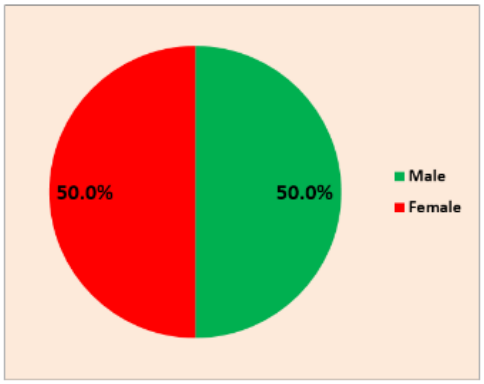
- Among the 100 diabetic patients, 22 patients (22%) had moderate control of DM with HbA1c levels in the range of 7.1%-8%, while 63 patients (63%) had a poor control of DM with HbA1c levels >8%.
- Hypertension was the most commonly associated systemic illness (25%) followed by Hypothyroidism (3%), Asthma (1%) and tuberculosis (1%).
- Among the various mucocutaneous manifestations observed, cutaneous infections (43%) were the most commonly observed.
- Among the cutaneous infections, fungal infections (26%) were most frequently observed, followed by bacterial infections (12%) and viral infections (5%).
- Dermatophytosis was the most commonly observed fungal infections (24 cases) followed by candidial infections (2 cases).
- Cellulitis (6 cases) was the most commonly observed bacterial infections (11%), followed by Furunculosis (3 cases), folliculitis and ccarbuncle 1 cases each.
- Among the viral infections, 4 cases (4%) of herpes zoster and 1 cases of verruca vulgaris were observed.
- Dermatoses associated with microangiopathy were observed in 3 patients (3%), of which 1 (1%) had diabetic dermopathy, 1 patient (1%) had diabetic bullae and 1 patient had Granuloma annulare.
- Dermatological manifestations due to metabolic condition were xanthelasma palpebrerum, seen in 2 patients (2%).
- Among the 2 patients of neuropathic changes, 2 patients had diabetic foot.
- Various dermatoses more commonly associated with diabetes were generalized pruritus 7%, psoriasis (3%), lichen planus (3%), macular amyloidosis (1%) and vitiligo (1%).
- Various non-specific manifestations like pemphigus 3 cases, 1 case of bullous pemphigoid, 1 case scabies and hansens were observed.

Sex	No. of cases	Percentage (%)
Male	50	50
Female	50	50
Total	**100**	**100**

Table 1: Sex distribution of patients



Graph 1

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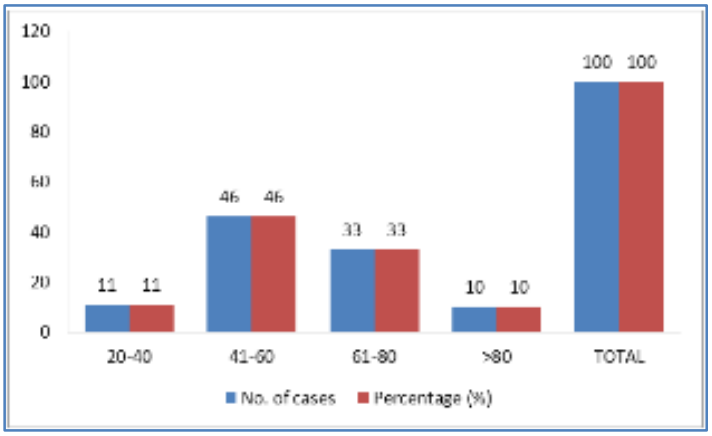
Age (years)	No. of cases	Percentage (%)
20-40	11	11
41-60	46	46
61-80	33	33
>80	10	10
TOTAL	**100**	**100**

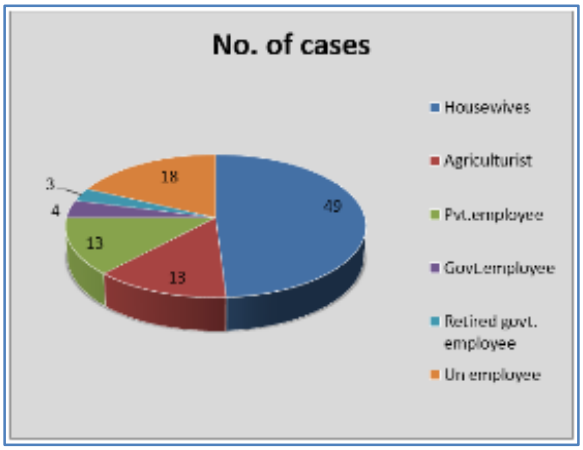
Table 2: Age distribution of the patients



Graph 2: Age distribution of the patients

Occupation	No. of cases	Percentage %
Housewives	49	49
Agriculturist	13	13
Pvt. employee	13	13
Govt. employee	4	4
Retired govt. employee	3	3
Un employee	18	18
Total	**100**	**100**

Table 3: Occupational status



Graph 3: Occupational status

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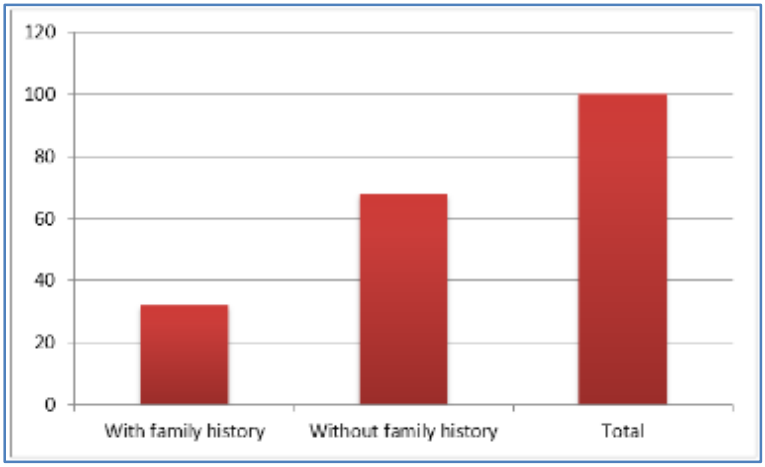
Family history	No. of patients	Percentage (%)
With family history	32	32
Without family history	68	68
Total	**100**	**100**

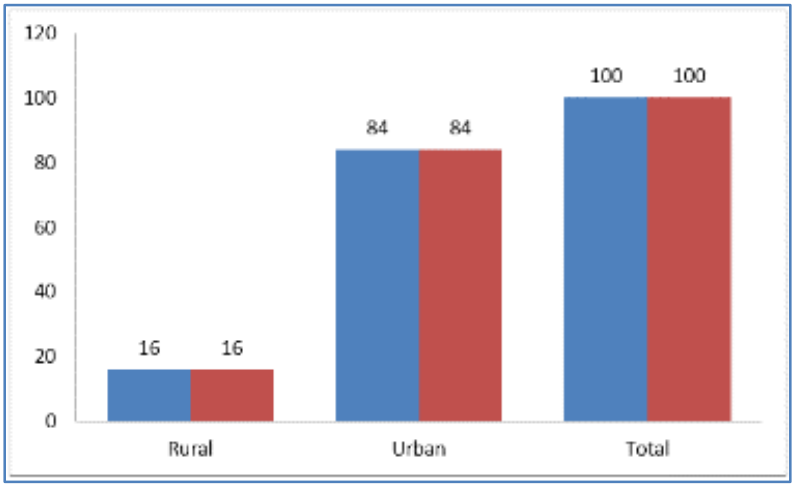
Table 4: Family history of diabeties



Graph 4: Family history of Diabeties

	No. of cases	Percentage (%)
Rural	16	16
Urban	84	84
Total	**100**	**100**

Table 5: Resident of patients on geographical location



Graph 5

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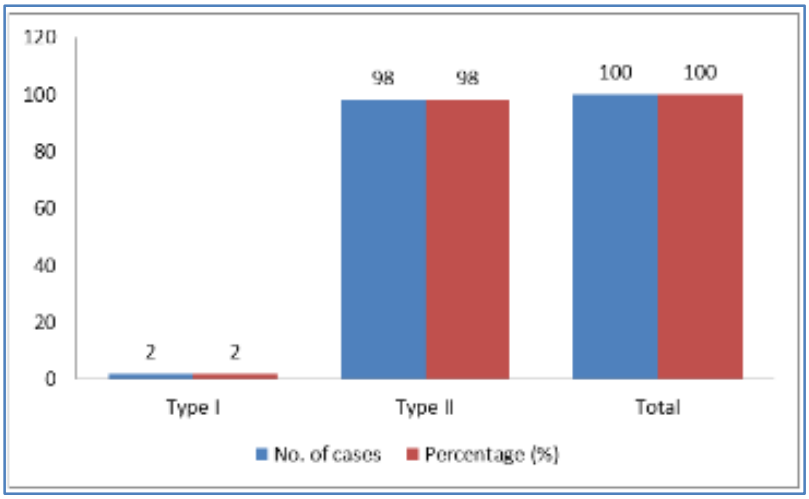
Type	No. of cases	Percentage (%)
Type I	2	2
Type II	98	98
Total	**100**	**100**

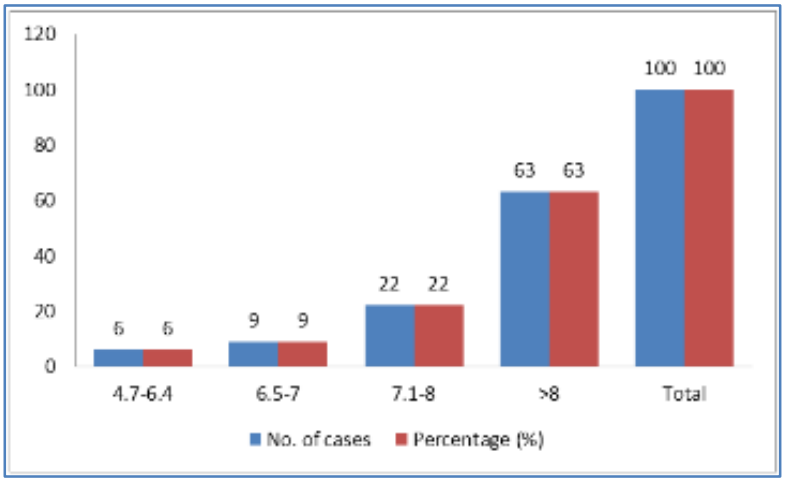
Table 6: Type of Diabetes Mellitus



Graph 6: Type of Diabetes Mellitus

HbA1c (%)	No. of cases	Percentage (%)
4.7-6.4	6	6
6.5-7	9	9
7.1-8	22	22
>8	63	63
Total	**100**	**100**

Table 7: HbA1c levels



Graph 7: HbA1C Status

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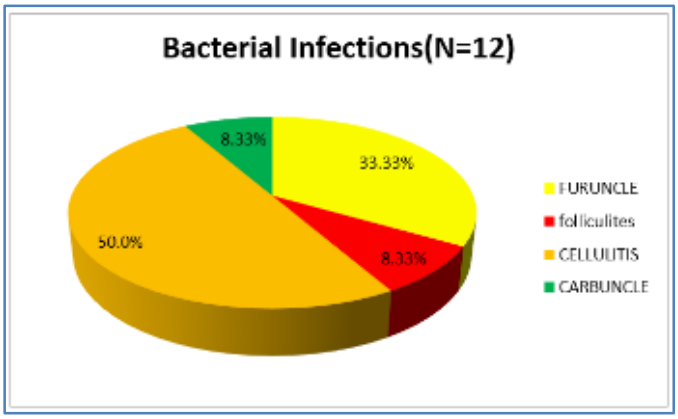
Bacterial infection	Percentage	NUMBER
Furunculosis	3	3 3.33
Folliculitis	1	8.33
Cellulitis	6	50.0
Carbuncle	1	8.33

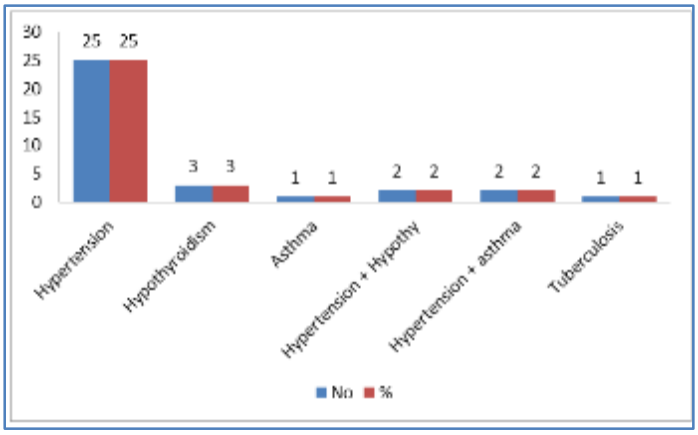
Table 8: Bacterial infection



Graph 8: Bacterial infection

Systemic diseases	No	%
Hypertension	25	25
Hypothyroidism	3	3
Asthma	1	1
Hypertension + Hypothy	2	2
Hypertension + asthma	2	2
Tuberculosis	1	1

Table 9: Systemic disease



Graph 9: Systemic diseases

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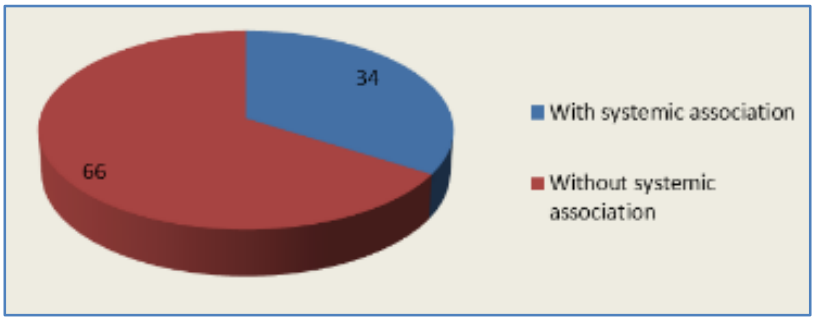
Association	Number	Percentage
With systemic association	34	34
Without systemic association	66	66

Table 10: systemic association of diabetes



Graph 10: systemic association of diabetes

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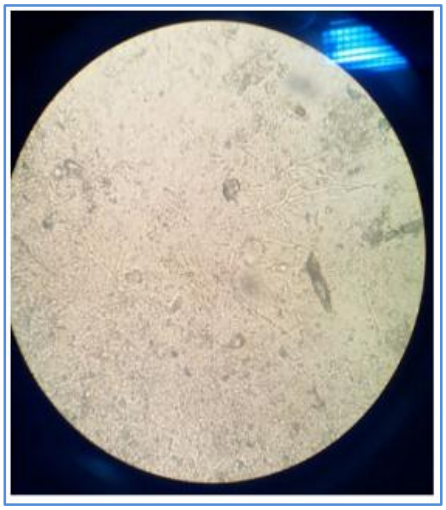

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