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Original Research Article

A clinicoepidemiological study of pattern of skin disorders among diabetes mellitus in a tertiary care centre

Durgavathi C[1]*, Deepa K[2], Samuel Jeyaraj Daniel[1], Sampath V[1]

[1]*Dept. of Dermatology, Madras Medical College & RGGGH, Chennai, Tamil Nadu, India*
[2]*Dept. of Dermatology, Madurai Medical College, Madurai, Tamil Nadu, India*

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ABSTRACT

Background: Diabetes Mellitus (DM), a most common metabolic disorder affects every organ of the body including skin causing increased morbidity and serious impact on quality of life. Aim of this study is to analyse the prevalence and pattern of cutaneous manifestations among type 1 and type 2 DM correlating it with the mean duration of diabetes.

Materials and Methods: This was an observational study conducted on 200 consecutive patients with DM attending dermatology department. Apart from detailed history, thorough clinical examination and relevant investigations were done. Skin biopsy were done in cases with diagnostic ambiguity.

Results: Cutaneous infections occurred in majority (70.5%). Among fungal infections (59.5%) candidiasis was the most common (28%). Pruritus and neuropathy were observed in 37% and 33% respectively and was more common in type 1 DM. Leg ulcer was observed in 8.5%. Vitiligo, oral lichen planus, granuloma annulare were seen common among type 1 DM. Psoriasis, acrochordon, acanthosis nigricans, cutaneous amyloidosis, bullous pemphigoid and diabetic bulla were common in Type 2 DM. Mucor mycosis, scleredema diabeticorum, cheiroarthropathy and perforating dermatoses were uniquely observed among prolonged uncontrolled diabetics.

Conclusion: Candidiasis was found to be an early manifestation of diabetes. Poor glycemic control and longer duration of diabetes were associated with an increased frequency and number of skin disorders. Skin manifestations are more common among undiagnosed and uncontrolled diabetics..

1. Introduction

Diabetes mellitus (DM) is a common chronic metabolic disorder that increases morbidity and mortality all over the world. The incidence of DM is increasing globally and it has severe impact on quality of life. Indians are believed to have a greater degree of insulin resistance and a stronger genetic predisposition to diabetes.[1] South and north India especially urban areas shows highest rate of prevalence of diabetes.[2,3] Skin manifestations in diabetes varies from 30-71%.[4–6]

Skin is affected directly by hyperglycaemia and also by non-enzymatic glycosylation producing advanced glycosylation products[7] (AGE) that initiates the intracellular signalling cascade that leads to keratinocyte proliferation, increases collagen rigidity, endothelial cell apoptosis, producing reactive oxygen species and inflammatory cytokines and impairing phagocytosis of inflammatory cells.[7]

Skin disorders can be the presenting sign of DM and markers for the underlying poor glycaemic control, hence diabetes and its complications can be diagnosed promptly, decreasing the morbidity and thus improves the quality of life. The aim of this study is to analyse the prevalence and

* *Corresponding author*.
E-mail address: durgavathiderm@gmail.com (Durgavathi C).

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pattern of skin disorders among diabetic patients in a tertiary care centre. As there are only few studies in south India that compares the dermatoses among type 1 and type 2 DM and its correlation with the mean duration of diabetes, this study was undertaken.

2. Materials and Methods

This was an observational study conducted in dermatology OPD of Madras medical college and RGGGH, a tertiary care centre in south India between October 2016 to September 2017. After Institutional ethics committee approval (EC Reg.No.ECR/270/Inst./TN/2013/NO.09122016) 200 consecutive diabetic patients with skin lesions were enrolled excluding subjects with other endocrine disorders. After obtaining informed consent, detailed history, general physical examination, specific and nonspecific cutaneous findings were documented in a proforma. Apart from three consecutive fasting and post prandial blood sugar levels, relevant investigations were done for all patients. Poor glycemic control was defined as an average of three consecutive fasting blood glucose >130 or <70mg/dL.[8] Tzanck smear, KOH mount and gram stain were done wherever needed. Skin biopsy was done only for cases with diagnostic ambiguity. Data recorded was analyzed statistically by SPSS software.

3. Results

Cutaneous manifestations of diabetes are divided into categories[9] like infections, dermatoses due to vascular damage and neurological damage, nail changes, granulomatous disorders, stiff skin and joints, dermatoses due to metabolic syndrome, dermatoses frequently associated with diabetes, non-specific dermatoses and treatment related cutaneous manifestations.

Out of 200 patients, 55 patients (27.5%) were type 1 DM and 145 patients (72.5%) were type 2 DM. We could not find any secondary diabetes or gestational diabetes. The age in type 1 DM patients ranged from 16 to 40 years and in type 2 DM patients ranged from 35 to 72 years. As in Figure 1, 54.5% was under 21-30 years of age in type 1 DM and 39.3% under 41-50 years of age in type 2 DM. As in Figure 2, 98 were males and 102 were females with male:female ratio of 0.96:1. Type 2 diabetics had a higher mean age than type 1 diabetics and this difference in mean age was statistically significant (p value<0.001).

As in Table 1, obesity and overweight a known risk factor for diabetes were observed in 62% of type 2 and 37% of type 1 diabetics. History of smoking and alcoholism was present in 32% in males and 6% in females. Family history of diabetes was noted in 53% of type 2 DM and 14% of type 1 DM. Comorbidities like hypertension(28%), hyperlipidaemia(16%), asthma(14%) and coronary heart disease(12%)was present in type 2 DM but less(<10%)in type 1 DM. Diabetes related nephropathy and retinopathy was observed in 12% and 4% of the cases in type 2 diabetics but less in type 1 diabetics(2% each). All the patients were on treatment out of which 53.5% were on oral hypoglycaemic drugs, 46.5% on insulin and 42% were on both. 32% of our subjects had history of irregular treatment.

Mean duration in our study was 5.2 years in type 1 DM and 5.9 years in type 2 DM. Majority (61%) had DM of duration less than 6 years. 79% had duration less than 10 years. We found in 18% of our patients, skin manifestations like candidiasis, balanoposthitis, erythrasma, leg ulcers, neuropathy and acrochordon were found to be the reason for diagnosing underlying diabetes through screening.

As in Table 2, cutaneous infections occurred in 70.5% of patients of which fungal infections were most common (59.5%). As in Table 3, among fungal infections, candidiasis (28%) was found to be common. As in Figure 3, type 1 DM patients were found to have oral thrush (7.1%) and balanoposthitis (7.1%) as the most common types. Vulvovaginal candidiasis (25%) was most seen presentation in females while males had balanoposthitis (16.1%) as common presentation among type 2 DM. 35% of candidiasis patients on screening found to have underlying undiagnosed type 2 DM.

As inTable 3, dermatophytosis (18.5%) was seen in 16.4% in type 1 DM and 19.3% in type 2 DM. Eleven cases of chronic and refractory dermatophytosis was seen. Trichophyton mentagrophytes is the most common species isolated. Three patients had recurrent dermatophytosis belonging to lower socio-economic status. All the six tinea pedis patients had onychomycosis. Pityriasis versicolor (12.5%) was more common in type 1 DM (21.8%) than type 2 DM (9%). One case of rhino cerebral zygomycosis was noted in type 2 DM of 7 years duration with ketoacidosis. He presented with facial, eyelid oedema, black eschar and palatal erosions.

As in Table 3, bacterial infections(25.5%) observed were furunculosis(10.5%), cellulitis(3%), erysipelas (1%), impetigo(0.5%), folliculitis(0.5%) which were more in type 2 DM(32.7%) than in type 1 DM(22.7%). Four (2%) uncontrolled type 2 diabetic patients had recurrent furunculosis with MRSA growth on culture. Most common corynebacterial infection seen in our study was erythrasma (8%) which was more in type 1 DM(20%) than type 2 DM(3.4%). It was found in obese patients involving mainly over axilla and groin. The prevalence of keratolysis punctata was found to be 2% with type 1 DM (3.6%) more than type 2 DM (1.4%). It was found in females who were housemaids. In our study we found three patients had herpes zoster and one had verruca vulgaris.

As in Table 2, neuropathy (33%) was more common in type 1 DM (45.5%) than type 2 DM (28.3%). Duration of DM was found to be less than 6 years in 70% of neuropathic patients. 60% had bilateral involvement.

Sensory neuropathy (77.3%) manifesting clinically as numbness, prickling, tingling sensation, etc was most common type. Autonomic neuropathy clinically seen as fissures over soles, callus, xerosis over legs was found in 15.2%. Motor neuropathy in form of hammer and claw toes was observed in 0.7%. Both sensory and autonomic neuropathy was reported in 6.1%.

Dermatoses due to metabolic syndrome was common in type 2 DM (24.5%) than type 1 DM (14.5%). We observed more acanthosis nigricans and acrochordons in type 2 DM (11%, 10.3%) than type 1 DM (9%, 5.4%). Xanthelasma and eruptive xanthoma was observed in type 2 DM (3.5%) alone. Eruptive xanthoma in a type 2 DM of 5 years duration, found to be having on hyperlipidaemia on screening.

Our study encountered leg ulcers in 8.5% of diabetics. Out of which 2 patients had pyoderma gangrenosum which was confirmed by diagnosis of exclusion. Improper foot care was present in around 38% of our leg ulcer patients. In our study we found a male smoker of 4 years DM (type 1) duration to have wet gangrene of the foot (0.5%). In our study we found only one case of diabetic dermopathy (0.5%) with underlying nephropathy. We could not find any patient with rubeosis in our study.

In present study we found granuloma annulare (3.6%)in type 1 DM which is more when compared with type 2 DM(0.7%). Necrobiosis lipoidica diabeticorum (0.7%) was noted in one patient with type 2 DM of 8 years duration. Cheiroarthropathy and scleredema diabeticorum (2%) was seen more in type 2 DM (2.1%) than in type 1 DM (1.8%). Scleredema (1.4%) was seen only in type 2 DM patients with mean duration of diabetes around 13 years and poor glycaemic control.

As in Table 4, Pruritus was present in 37% of our study. Truncal pruritus was seen in 20% and anogenital pruritus in 17%. Type 1 Diabetics(46%) had more pruritus than type 2 Diabetics(34%). 13% of the study population had nail changes such as beau's lines, leukonychia, pterygium, nail plate thickening, pitting, onycholysis and infections such as onychomycosis, periungual wart and pseudomonas paronychia. Pseudomonas paronychia characterised by greenish discoloration of nail fold and plate was found in housemaids. We found 10% of our patients had xerosis which is more common in type 2(10%) than type 1(9%). Vitiligo was encountered more in type 1 DM (12.7%) than type 2 DM (2.8%). Perforating dermatoses (4%) was seen only in type 2 diabetics of which six patients had diabetic nephropathy with uncontrolled diabetes and prolonged mean duration of 8 years. Psoriasis (6%), bullous pemphigoid (3.5%) and diabetic bulla(2%) were seen only in type 2 diabetics. Three subjects with diabetic bulla had nephropathy. One patient was diagnosed to have glipizide induced bullous pemphigoid (Table 5) confirmed by skin biopsy and direct immunofluorescence. Cutaneous amyloidosis was seen more in type 2 DM (4.3%) than in type 1 DM (1.8%). Oral lichen planus (3.6%) was present in type 1 diabetics. Nonspecific dermatoses like IGH, pigmented purpuric dermatoses, scabies, seborrheic keratosis, seborrheic dermatitis, contact dermatitis, senile comedones, discoid lupus erythematosus, syringoma were found in 6% of our cases.

As in Table 6, subjects with infections and neuropathy had a higher mean duration than subjects without infections and neuropathy and this difference in mean duration of disease was statistically significant. As in Table 7, more than one lesion was present in 112 patients(56%). As in Table 7 and Figure 4, there was a positive linear relationship between number of lesions and mean duration of diabetes as found by Pearson's correlation. Hence as the duration of diabetes increases, the number of skin lesions will also tend to rise. As in Table 8, poor glycaemic control was found in 122 patients (61%) which was more in type 2 DM(70%) than type 1(30%). Among poor glycaemic control subjects, 91% in type 2 DM and 75% in type 1 DM had more than one skin lesion.

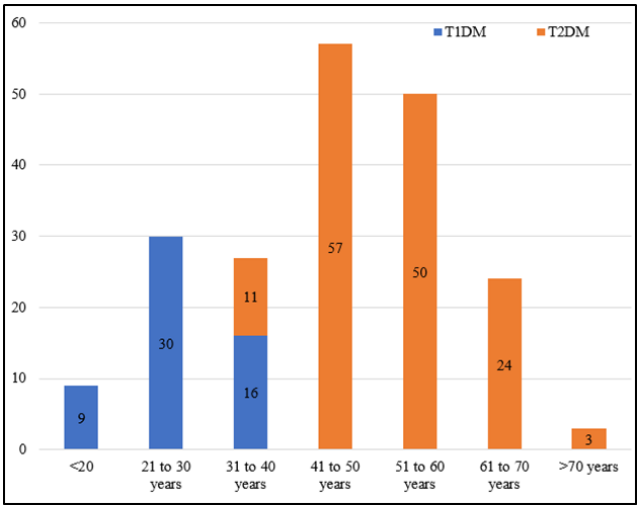

Figure 1: Age distribution chart of the study population (n=200)

4. Discussion

Diabetes can affect every organ and system in the body including skin. Skin manifestations in diabetes varies from 30-71%.[4–6]

Out of 200 patients, 55 patients (27.5%) were type 1 DM and 145 patients (72.5%) were type 2 DM. We found 41-50years of age is most common(39.3%) age in type 2 diabetics similar to study by Mahajan(33%) et al.[10] More than 40 years of age is an independent risk factor for developing diabetes as they are under high level of stress prioritising their career development and are usually diagnosed after a long history of hyperglycaemia. In the present study male:female ratio was 0.96:1 which is similar

Table 1: Sociodemographic characteristics of the study population(n=200)

Socio demographic characteristics		Type I		Type II	
		Freq.	%	Freq.	%
BMI	Normal	25	45	30	21
	Underweight	10	18	25	17
	Overweight	12	22	65	45
	Obese	8	15	25	17
Martial status	Single/ Separated/ Divorced	26	47	31	21
	Married	29	53	114	79
Education level	Literate	39	71	98	68
	Illiterate	16	29	47	32
Place of residence	Rural	18	33	27	19
	Urban	37	67	118	81
Socio-economic status	Upper	3	6	20	14
	Upper middle	20	36	34	24
	Lower middle	10	18	45	31
	Upper lower	11	20	25	17
	Lower	11	20	21	14
Occupation	Employed	22	40	44	30
	Self Employed	18	33	46	32
	Unemployed	15	27	55	38

Table 2: Distribution of skin lesions in various categories (n=200)

Skin lesions	Type 1 DM N (%)	Type 2 DM N (%)	Total N (%)
Infection	41 (74.5)	100 (69)	141 (70.5)
Neuropathy	25 (45.5)	41 (28.3)	66 (33)
Dermatoses due to metabolic syndrome	8 (14.5)	36 (24.5)	44 (22)
Lesions due to Vascular damage	5 (9.1)	14 (9.7)	19 (9.5)
Granulomatous skin lesions	2 (3.6)	2 (1.4)	4 (2)
Stiff skin & Joints	1 (1.8)	3 (2.1)	4 (2)
Dermatoses frequently associated with diabetes	22 (38.2)	71 (45)	92 (46)
Treatment related lesions	3 (5.5)	4 (2.9)	7(3.5)

Table 3: Distribution of cutaneous infections in the study population (n=200)

Cutaneous infections	Type	Type 1 Diabetes N (%)	Type 2 Diabetes N (%)	Total N (%)
Fungal	Candidiasis	15 (27.3)	41 (28.3)	56 (28)
	Dermatophytosis	9 (16.4)	28 (19.3)	37 (18.5)
	Tinea versicolor	12 (21.8)	13 (9)	25 (12.5)
	Mucor mycosis	0 (0)	1 (0.7)	1 (0.5)
Bacterial	Furunculosis	4 (7.3)	17 (11.7)	21 (10.5)
	Cellulitis	1 (1.8)	5 (3.4)	6 (3)
	Erysipelas	0 (0)	2 (1.4)	2 (1)
	Impetigo/Folliculitis	0 (0)	2 (1.4)	2 (1)
	Erythrasma	11 (20)	5 (3.4)	16 (8)
	Keratolysis punctata	2 (3.6)	2 (1.4)	4 (2)
Viral	Herpes Zoster & Verruca	1 (1.8)	3 (2.1)	4 (2)

Table 4: Distribution of skin lesions frequently associated with diabetes(n=200)

Skin lesions	Type 1 DM N (%)	Type 2 DM N (%)	Total N (%)
Pruritus	25 (46%)	49 (34%)	74 (37%)
Nail changes	5 (9%)	21 (14.5%)	26 (13%)
Xerosis	5 (9%)	15 (10%)	20 (10)
Vitiligo	7 (12.7)	4 (2.8)	11 (5.5)
Psoriasis	0 (0)	12 (8.2)	12 (6)
Perforating dermatoses	0 (0)	8 (5.5)	8 (4)
Bullous pemphigoid	0 (0)	7 (4.8)	7 (3.5)
Cutaneous amyloidosis	1 (1.8)	6 (4.3)	7 (3.5)
Cherry angiomas	0 (0)	12 (8.2)	12 (6)
Diabetic bulla	0 (0)	4 (2.8)	4 (2)
Lichen Planus	2 (3.6)	1 (0.7)	3 (1.5)
Pretibial myxedema	0 (0)	1 (0.7)	1 (0.5)

Table 5: Distribution of treatment related skin disorders in the study population (n=200)

Treatment	Type	Type 1 DM N (%)	Type 2 DM N (%)	Total N (%)
Insulin	Lipoatrophy	1 (1.8)	1 (0.7)	2 (1)
	Keloid	2 (3.6)	0 (0)	2 (1)
OHA	Photosensitivity	0 (0)	1 (0.7)	1 (0.5)
	Fixed drug eruptions	0 (0)	1 (0.7)	1 (0.5)
	Bullous pemphigoid	0 (0)	1 (0.7)	1 (0.5)

Table 6: Relationship between duration of diabetes and occurrence of dermatoses due to neuropathy, vascular damage and infections (n=200)

Dermatoses due to		Mean duration	Std. Deviation	P Value	95% confidence interval
Infections	Present	6.5	4.5152	< 0.001	1.46 to 3.98
	Absent	3.778	2.9263		
Vascular damage	Present	7.763	5.6969	0.027	0.263 to 4.302
	Absent	5.480	4.0725		
Neuropathy	Present	7.229	5.0095	<0.001	1.052 to 3.519
	Absent	4.943	3.6757		

Table 7: Correlation between duration of diabetes and number of skin lesions (n=200)

Number of lesions	N	Mean	Std. deviation
0	2	0.500	0.7071
1	86	4.996	3.6264
2	89	5.957	4.2248
3	23	7.765	5.9137
Total	200	5.697	4.2881

Pearson's correlation: 0.219
p value: 0.001

Table 8: Relationship between poor glycemic control and number of lesions(n=122)

Skin manifestations	Poor glycemic control (Average of 3 consecutive FBS > 130 or < 70 mg/dl) n=122(61%)		
	Type 1 Diabetes N(%)	Type II diabetes N(%)	Total N(%)
>1 skin lesion	27 (75)	78 (91)	105 (56)
1 skin lesion	9 (25)	8 (9)	17 (5.5)
Total	36 (100)	86 (100)	122 (100)

p value is 0.0224
Statistically significant at p<.05

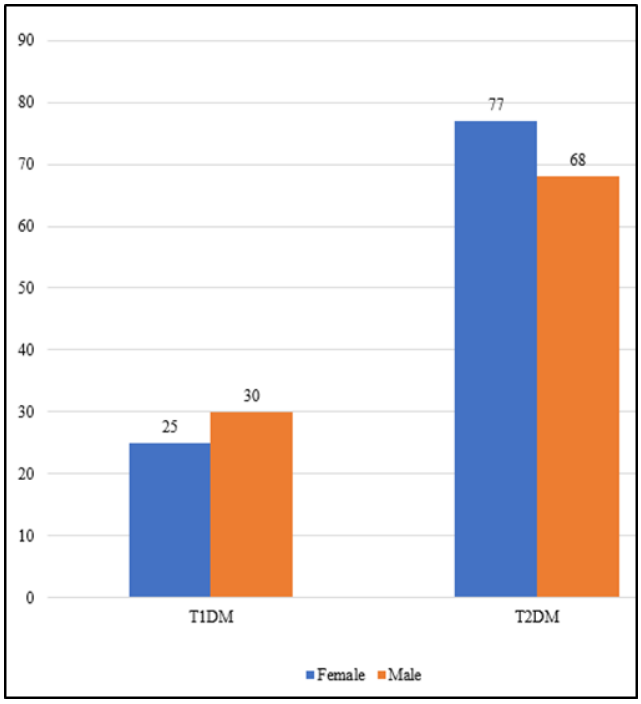

Figure 2: Gender distribution of the study population (n=200)

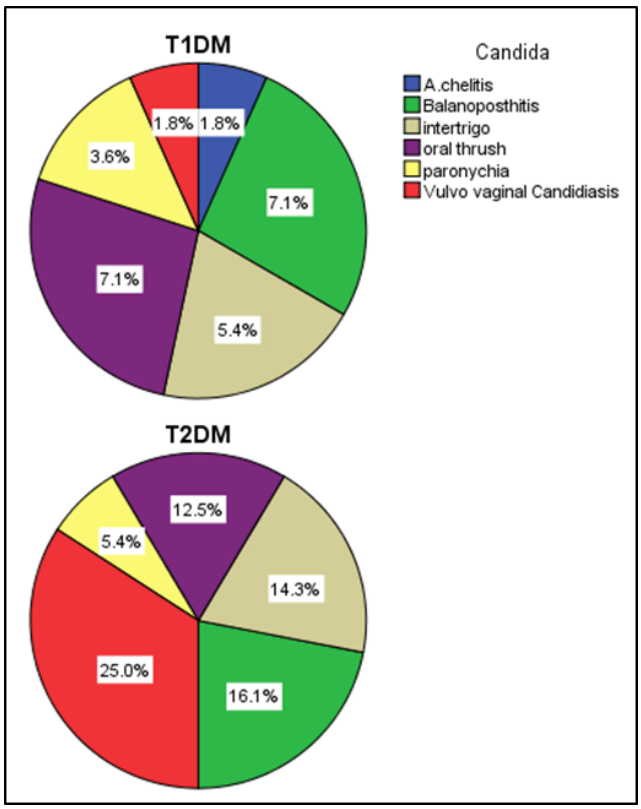

Figure 3: Distribution of types of candida infections (n=44)

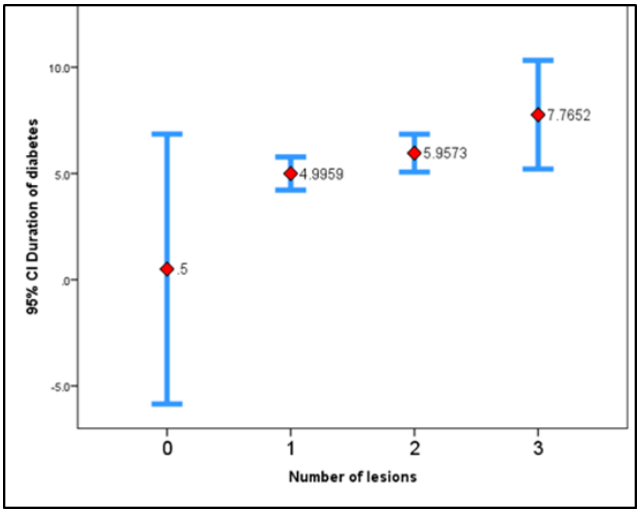

Figure 4: Correlation between duration of diabetes and number of skin lesions (n=200)

to Mahajan[10] (1:1.38).

Comorbidities like hyperlipidaemia, hypertension were more common in type 2 diabetics than type 1 which is similar to Bhat et al.[6] This may be attributed to more number of patients seen in our study were in the age greater than 40 years.

Mean duration of 5.2 years in type1 DM and 5.9 years in type2 DM in our study is less compared to Roshni[11] et al (7.4 years)indicates duration of diabetes may be an independent risk factor for developing early cutaneous manifestations among diabetics which needs to be evaluated in future studies. This may also be due to the increased awareness, improved health facilities and high literacy rate found in our region. Poor glycemic control (61%) seen in our study is more compared to Bhat (55%) et al.[6] Reason may be due to factors such as alcoholism, increased BMI, lack of physical exercise and irregular treatment noted among our subjects. Mucocutaneous manifestations were the reason for diagnosing underlying undiagnosed diabetes in 18% of our subjects which is similar to Roshni(21.6%) et al.[11] This indicates skin can be a marker of underlying undiagnosed diabetes.

Cutaneous infections occur in 70.5% of patients in our study. This is similar to the observation done by Naheed et al[12] (72%), Baloch[13] et al(62.2%) and more than in Mahajan et al[10](54.69%) This may be due to poor glycaemic control and tropical climate in our region.

In our study we found fungal infections were most common(59.5%) out of which candidiasis(28%) as the most common fungal infections. This is more compared with Mahajan et al[10](30.4%). This may be due to poor glycaemic control and poor oral hygiene. 35% of candidiasis patients on screening found to have underlying undiagnosed diabetes and thus it can serve as clinical marker for early diagnosis

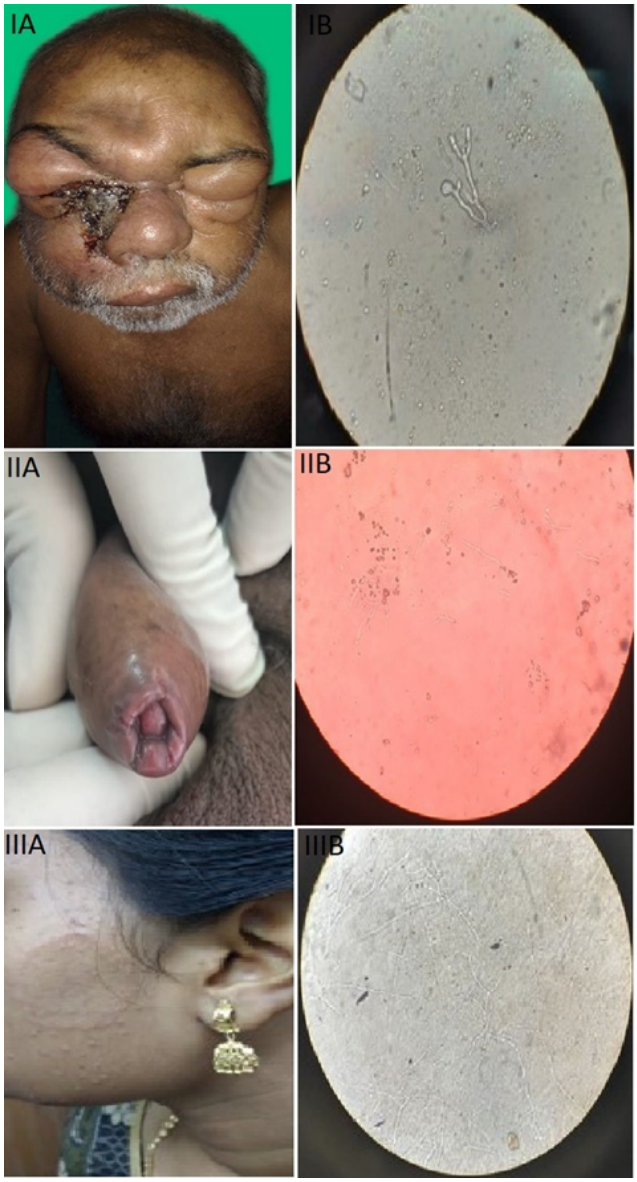

Figure 5: IA: A case of mucor mycosis showing black eschar, eyelid edema and facial edema; **1B:** KOH wet mount shows broad ribbon shaped hyphae branching at acute angle; **11A:** A case of Candidal balanoposthitis showing fissuring, erythema and edema seen on the glans and prepuce; **11B:** KOH wet mount shows pseudohyphae and budding yeasts; **111A:** A case of Tinea faciei showing annular scaly plaque with central clearing and active border; **111B:** KOH wet mount shows hyaline refractile long and branched septate hyphae with arthrospores

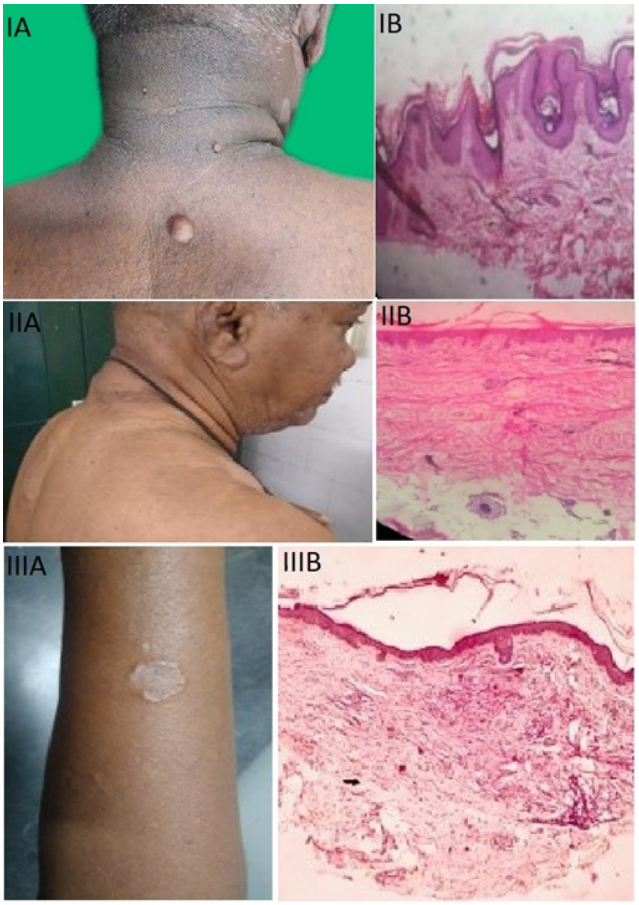

Figure 6: 1A: A case of acanthosis nigricans-dark thick velvety skin with acrochordons; **1B:** Histology shows orthohyperkeratosis, papillomatosis, mild irregular acanthosis, slight hyperpigmentation of basal layer; **11A:** A case of scleredema diabeticorum showing non pitting induration with mild erythema over upper back and neck; **11B:** Histology shows thickened collagen separated from one another with intervening mucin; **111A:** A case of granuloma annulare showing annular plaque over forearm; **111B:** Histopathology shows interstitial pattern of infiltrates in upper and mid dermis.

of diabetes.

In our study 18.5% had dermatophytosis which is more when compared to Bhat et al[6](8%). Chronic and refractory dermatophytosis may be due to ethnic susceptibility, tropical climate, species variability and poor hygiene. Reason for recurrent dermatophytosis seen more among lower socioeconomic group in our study can be explained by overcrowding, fomite transmission and delayed treatment initiation. More number of pityriasis versicolor(12.5%) in type 1 DM(21.8%) than type 2 DM(9%) may be due to younger age group and tropical climate. This is more compared to Manish[14] (3%) et al. Acidic pH seen in uncontrolled diabetes makes patient more prone to mucormycosis and thus angioinvasion, thrombosis and

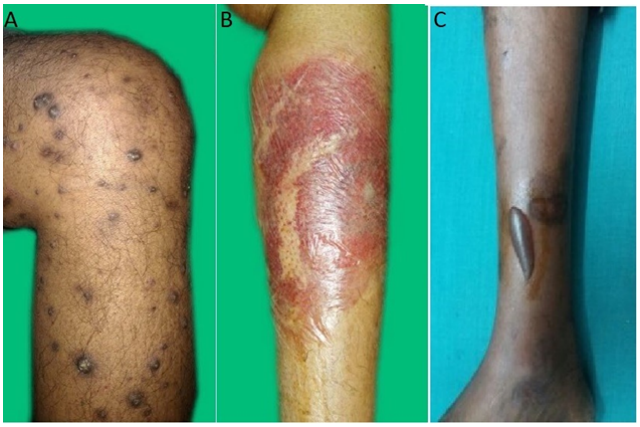

Figure 7: A: Shows hyperkeratotic papules and nodules with central keratin of perforating dermatoses over leg; **B:** Shows erythema, edema, bulla and oozing in a case of cellulitis over leg; **C:** Shows diabetic bulla over leg

tissue necrosis occurs.

Our study showed bacterial infections (25.5%) as the next common infection. It is less compared to Roshni et al[11] (33.78%) which may be due to the increased use of over the counter antibiotics. Type 2 diabetics(32.7%) had more bacterial infections than type 1 diabetics(22.7%). This is more compared to Ahmed[15] et al(18.6%) which can be explained by more poor glycaemic control found among our type 2 diabetics. We noted that erythrasma(8%) was the common corynebacterial infection. This may be due to the warm, humid climate and obese individuals seen in our study.[16]

Neuropathy (33%) seen in our study is more compared to Mahajan et al[10] (25%). It prompts research in newer diagnostic and therapeutic field in diabetic neuropathy. Neuropathy seen in type 1 DM(45.5%) is more compared to Dyck(26.8%) et al[17] which needs further research.

In our study, 24.5% of type 2 diabetics and 14.5% of type 1 diabetics had dermatoses related to metabolic syndrome. This is more when compared to Ahmed[15] et al(8%, 1.2%). This may be due to the increased body mass index seen among our patients.

Leg ulcer(8.5%) observed in our study is more compared to Abhishek et al(0%)[18] and less when compared to Ahmed[15] (12.9%)et al. This may be due to neuropathy and poor foot care. Dermopathy (0.5%) was found to be less compared to Mahajan et al[10] (9.3%). This may be due to the prevalence of darker skin in south Indians making it difficult to identify. For the same reason rubeosis was not documented in our study. Wet gangrene of the foot (0.5%) found to be less when compared to Ahmed et al (12.9%)[15] as these patients may attend vascular department rather than dermatology.

Granuloma annulare was observed more in type 1 DM%(3.6%) than type 2 DM(0.7%). This is more when compared to Roshni et al[11] (0.33%). Necrobiosis lipoidica seen only in type 2 DM patient (0.7%) is similar to Bhat(1.3%) et al.[6] This is because of rarity of necrobiosis lipoidica.

In our present study cheiroarthropathy and scleredema diabeticorum seen in 2% is similar to Mahajan et al[10] (2%) which may be attributed to longer duration and poor glycaemic control.

In the current study, 13% of the study population had nail changes. This was less when compared to Abhishek (20%) et al.[18] This may be due to early skin manifestations and prompt initiation of treatment. The increased incidence of pruritus (37%) compared to 4.5% in Nigam et al.[19] was due to more cases of neuropathy and xerosis in our study. Type 1 Diabetics had more pruritus compared type 2 Diabetics needs further research. Xerosis (10%) is more compared to Bhat(3.3%)[6] et al can be explained by increased neuropathy seen in our study. Bullous diabeticorum was seen in 2% of our study is more compared to Abhishek (1%) et al.[18] Vitiligo encountered more in type 1 DM than type 2 DM explains its autoimmune aetiology. Perforating dermatoses (4%) was seen only in type 2 diabetics in our study is more compared to Mahajan (3%) et al.[10] This may be due to poor glycaemic control in type 2 diabetics with underlying nephropathy. Bullous pemphigoid, cherry angioma, and cutaneous amyloidosis were present only in type 2 diabetics which may be due to older age of onset.

Photosensitivity, fixed drug eruption and bullous pemphigoid to oral hypoglycaemic drugs (1.5%) is less compared to Mahajan et al.[10](3%). This may be due to diversity in genetic ethnicity and tropical climate.

As the duration of diabetes increases, the number of skin lesions also increases which is in concordance with Chatterjee et al.[20] 56% of patients showed more than one lesions in present study is more compared to Roshni et al[11](44.7%) and less compared to Abhishek Goel et al[18] (80%). Among poor glycemic control subjects, majority in type 2(91%) and type 1(75%) DM showed more than one lesion. This may be due to varied skin manifestations of DM. Thus there is direct correlation between dermatoses, glycemic control and duration of disease which in turn will help in preventing the long term complications of diabetes.[21–23]

5. Conclusion

Cutaneous infections were most common skin disease found in this study. Granuloma annulare, oral lichen planus, neuropathy and pruritus was more common among type 1 DM. Psoriasis, acrochordons, acanthosis nigricans, cutaneous amyloidosis, bullous pemphigoid, perforating dermatoses, cherry angioma and diabetic bulla were more common in type 2 DM. Candidiasis and pruritus may herald an early manifestation of diabetes. Perforating dermatoses, diabetic bulla and dermopathy can help in

diagnosis of complication of diabetes such as nephropathy. Lesser mean duration can also lead to early cutaneous manifestations which needs to be evaluated in further studies. Thus, skin acts as a window not only to identify underlying undiagnosed diabetes but also dreadful complications of diabetes such as nephropathy and helps in preventing irreversible damage, decreasing the morbidity and improving the quality of life. This emphasizes the importance of the physicians to be made aware of cutaneous manifestations of diabetes which will in turn have a positive impact on our health system.

6. Limitations

Since this is a hospital based observational study, prevalence of skin diseases may not reflect the actual prevalence of our community. An increased duration of study or larger study population would have substantiated the above findings.

7. Source of Funding

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8. Conflict of Interest

None declared.

9. Ethical Approval

The study was approved by the institutional ethics committee.

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Author biography

Durgavathi C, Assistant Professor https://orcid.org/0009-0003-7078-5683

Deepa K, Associate Professor

Samuel Jeyaraj Daniel, Associate Professor

Sampath V, Professor & HOD

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