ORIGINAL RESEARCH PAPER

General Medicine

A CLINICAL STUDY OF MUCOCUTANEOUS MANIFESTATION IN DIABETIC PATIENTS

KEY WORDS: Cutaneous, Diabetes Mellitus, Mucocutaneous, Hyperglycemia.

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ABSTRACT

BACKGROUND: Diabetes mellitus is a chronic disease which leads to various mucocutaneous diseases.
Aims and objectives: 1. To study mucocutaneous manifestation of diabetes mellitus. 2. To compare mucocutaneous manifestation in controlled and uncontrolled diabetes mellitus.
METHODOLOGY: This prospective study was carried out on 200 patients with diabetes mellitus in Department of Medicine, Jawahar Lal Nehru Medical College and Hospital, Ajmer, Rajasthan.
RESULTS: Out of 200 patients diabetic foot ulcers were present in 3% (6) cases, diabetic bullae, necrobiosis lipoidica diabeticorum, granuloma annulare respectively in 0.5% (1) case, 1.5% (3) cases, 2%(4) cases, 2.5% (5) alopecia areata, 2.5% (5) Lichen amyloidosis, 1.5% (3) macular amyloidosis, 1.5% (3) vitiligo 1% (2) carbuncle, 1% (2) eruptive xanthomas, SLE in 0.5% (1) cases, systemic sclerosis in 1% (2) cases, localized sclerosis Morphea in 1% (2) cases, psoriasis in 1.5% (3) cases , Lichen planus in 2% (4) cases, yellow palms in 0.5% (1) case and pterygium unguis inversus in 0.5% (1) case.
CONCLUSION: There are a diverse muco-cutaneous manifestation of diabetes mellitus of which some are specific and some are non specific. Study and careful examination of this disorder may be helpful in early diagnosis of diabetes mellitus.

INTRODUCTION

Abnormal insulin secretion and/or utilization, leads to hyperglycemia which has adverse effects on the heart, blood vessels, kidney, nervous system, eye and skin.[1] The knowledge of the cutaneous signs of diabetes mellitus (DM) can be valuable to the clinicians as their observation can point towards the diagnosis of diabetes. Mostly, these cutaneous findings manifest after the diagnosis of DM, but they may appear coincidentally with its onset, or even precede diabetes by many years.[2] Some manifestations can have direct correlation with diabetic control, duration and other multisystem complications such as neuropathy and nephropathy and maybe of prognostic significance. Etiopath ogenesis of cutaneous manifestations is multi-factorial and alteration of metabolic pathways, hyperg lyc emia, formation of advanced glycation end products, cell apoptosis, decreased vasodilation, induction of proinfla mm atory cytokines, oxidative stress leading to vascular involvement in the form of atherosclerosis and microang iop athy, neuronal involvement in the form of sensory, motor and autonomic neuropathies, impaired host mechanisms, etc. have all been variably implicated.[1,3,4] In India, muco-cutaneous manifesta tions have been reported in 43-66% of patients with diabetes.[2] The magnitude of cutaneous manifestations maybe grossly under-estimated as the lesions are often neglected, by the patients and their physicians. With India slated to become the diabetes capital of the world in the near future, comorbidities including cutaneous lesions merit attention.

MATERIAL AND METHODS

The study was carried out on all 200 patients with diabetes attending outpatient & inpatient Department of Medicine, J.L.N. Hospital, Ajmer.

INCLUSION CRITERIA:

1. Inclusion criteria for study was patient with raised fasting or postprandial blood sugar level as per diagnostic criteria for diabetes mellitus adopted by American Diabetes Association 2007 & W.H.O. and those require treatment for diabetes mellitus both type 1 and type 2.[5]

EXCLUSION CRITERIA

1. Patient with HIV/AIDS.
2. Patient with malignancy.
3. Patient on dialysis.
4. Patient with terminal illness.
5. Those with gestational diabetes, family history, impaired GTT.[6]

Diabetes mellitus is a heterogeneous group of diseases, characterized by a state of chronic hyperglycaemia resu lting from various aetiologies, environmental and genetic, acting together.[7]

A detailed history including age, sex, race, religion, occupation, socioeconomic status, clinical sign and symp toms, their duration, history of evolution and progr e ssion of lesion and its treatment, if any were recorded.

A thorough dermatological, general physical and systemic examinations were done. All cutaneous and mucous lesions were recorded. Relevant laboratory investigation including complete blood count, blood sugar both fasting and postprandial, urine examination, liver and kidney function test, lipid profile, fundus examination by an ophthalmologist, KOH examination, gram staining of pus in selected cases were done.

Assessment of diabetic neuropathy was done on basis of criteria detailed by foster.[8] Relevant microbiological and histopathological (biopsy) examinations were carried out in selected cases to confirm clinical diagnosis.

RESULTS

Most commonly affected age group was 41-60 year age group 54.5% (109) patients. Male: Female ratio was 1.32:1; slight male preponderance is common in south East Asia according to WHO. Most commonly affected religious group of was Hindu's affected in 73% (146) cases followed by Muslims in 18% (36) cases, Sikh in 5.5% (11) cases and Christian were least affected with 3.5% (7) cases. 181 (90.5%) patient were married, 6% (12) patients were unmarried, 3% (6) were widow and 0.5% (1) was divorcee. Urban patient (76% (152)

were more commonly affected as compared to rural patients affected in 24% (48) cases. 38.5% (77) patients were graduate, 25.5% patients were matric while only 12.5% (25) patients were illiterate. Family history of diabetes was positive in 36.5% (73) patients.

Average (mean) fasting blood sugar level was 139.43 mg/dl while average (mean) postprandial blood sugar level was 220.69mg/dl. Average duration of diabetes was 4.15 years which shows that mucocutaneous manifestation are more common in diabetes with longer duration. Diabetes was controlled in 13% (26) patients and was uncontrolled in 87% (174) patients which shows that mucocutaneous manifestation are more common in patients with uncontrolled diabetes mellitus. Hypertension was most common systemic associ ation of diabetes with mucocutuneous manifestation in 35% (70) patients.

Fungal infections were most common mucocutaneous manife station of diabetes mellitus in 32.5% (65) cases followed by bacterial infections (pyodermas) in 21% (42) cases. Most common fungal infections in diabetes was infection with dermatophytes (11.5%) followed by candidal infections (11%), onychomycosis (7%) and pityriasis versicolor in 3% cases. Most common bacterial infection was furunculosis (multiple boils) followed by folliculitis, erythrasma and intertrigo. Paresthesia was most common neurological manifestation of diabetes mellitus. Most common connective tissue disorder due to non-enzymatic glycosylation of collagen was sclerosis of finger (finger pebbles) in 9% (18) cases, Scleredema diabeticorum 4% (8 cases) and limited joint mobility in 3.5% (7) cases.

Among disorder of keratinization most common disorder was acanthosis nigricans in 10.5% (21) cases, acquired ichthyosis in 6.5% (13), palmoplantar keratoderma PPKD in 4.5% (9) cases. Most papulosquamous disorder observed were shin spots in 7% (14) cases and xerosis in 4% (8) cases. Xanthelasma was most common metabolic disorder present in 7% (14) cases.

TABLE 1: PATTERN OF DERMATOSIS

Skin Disease	No. of patient (%)
Dermatophytic fungal infection	23 (11.5%)
Candidal infection	22 (11%)
Generalized pruritus	21 (10.5%)
Acanthosis nigricans	21 (10.5%)
Skin tags	19 (9.5%)
Furunculosis (Boils)	18 (9%)
Sclerosis of finger (finger pebbles)	18 (9%)
Onychomycosis	14 (7%)
Shin spot	14 (7%)
Xanthelasma	14 (7%)
Acquired ichthyosis	13 (6.5%)
Rubeosis faciei	13 (6.5%)
Urticaria	9 (4.5%)
Seborrheic keratosis	9 (4.5%)
Periocular melanosis (POM)	9 (4.5%)
Photodermatitis	9 (4.5%)
Folliculitis	8 (4%)
Scleredema diabeticorum	8 (4%)
Melasma	8 (4%)
PIH (Post Inflammatory Hyperpigmentation)	8 (4%)
Limited joint mobility	7 (3.5%)
Diabetic foot ulcer	6 (3%)
Lichen amyloidosis	5 (2.5%)
Carbuncle	2 (1%)
Eruptive xanthoma	2 (1%)
Lipohypertrophy	1 (0.5%)
Diabetic bullae	1 (0.5%)

Among the disorder of pigmentation, periocular melanosis (POM) in 4.5% (9) cases, melasma and post inflammatory hyperpigmentation each in 4% (8) cases were important mucocutaneous manifestation observed in our study. Telogen effluvium 5% (10 cases) and nail dystrophy in 4% (8) cases were most common hair and nail disorders presented respectively in our study. Among the benign skin conditions skin tag (acrochordon) 9.5%, seborrheic keratosis 4.5%, cherry angiomas (4.5%), freckles (4%) and DPN (3.5%) were important manifestation presented. Rubeosis faciei (6.5%), necrobiosis lipoidica diabeticorum (1.55), granuloma annulare (2%) were important specific dermatosis associated with diabetes.

Diabetic foot ulcer (3%) and diabetic bullae (0.5%) were important mucocutaneous manifestation presented due to complication of diabetes mellitus. Generalized pruritus was present in (10.5%) patients and urticaria was present in (4.5%) cases. Among the dermatosis due to complication of treatment of diabetes mellitus, lipohypertrophy was present in 1 (0.5%) case and EM like rash was present in 1 (0.5%) case.

TABLE 2: DISORDER OF PIGMENTATION (N=200)

Disorder of pigmentation	No. of patient (%)
Periocular melanosis (POM)	9 (4.5%)
Melasma	8 (4%)
PIH (Post inflammatory hyper pigmentation)	8 (4%)
IGHM (Idiopathic guttate hypomelanosis)	7 (3.5%)
PPD (Pigmented purpuric dermatosis)	5 (2.5%)
Vitiligo	3 (1.5%)
Yellow palms	1 (0.5%)
Addisonian pigmentation of face and hands	1 (0.5%)
Total	**42 (21%)**

DISCUSSION

The clinical study for mucocutaneous manifestation in diabetes mellitus was carried out on all patients of diabetes mellitus attending the outpatient and inpatient, Department of Medicine, Jawahar Lal Nehru Hospital, Ajmer. Two hundred patients were registered under this study. Out of 200 patients there were 57% (114) were male and 43% (86) were female. The male: female ratio was 1.32:1. There was slight male preponderance but this difference was not significant. Some studies have shown slight male preponderance and some others shown slight female preponderance.[9] Age of patients ranged from 21 year to 80 years. Average (mean) age of presentation with mucocu taneous manifestation was 53.69 years.

Out of 200 patients majority were belonged to 5th, 6th and 7th decade of life, 23.5% in 5th decade, 31% patient in 6th decade, 19.5% patient in 7th decade of life with maximum patient belonged the 41-60 years age group 109 (54.5%) patients. Chhabra SN in his study had observed that maximum case was belonged to 41-60 year age group (56.8%) similar to our study.[10]

Average age of duration of diabetes presented with mucocut aneous manifestation was 4.15 years, minimum duration of diabetes mellitus observed was only one month to maximum duration of diabetes mellitus observed 25 years. Majority of patient had 10 years duration were 7.5% patients. It shows that diabetes mellitus can fairly recognize or suspected with mucocutaneous manifestation alone. Alteras and Saryat and Dogra et al. also reported that in majority of patient with diabetes mellitus, mucocutaneous manifestation significantly correlated with duration of diabetes mellitus ($P<0.05$), (in their study duration of disease was less than 6 years in maj

ority of patients.[11,12]

Out of all 200 patients average fasting blood sugar level was 139.43 mg/dl, average postprandial blood sugar level was 220.69mg/dl. Out of all 200 patients 8% (16) patient was on insulin for control of their blood sugar level and 92% (184) patient were on oral hypoglycemic drugs. In spite of treatment in all patients, blood sugar level was uncontrolled in 87% patients; it was controlled only in 13% (26) patient with mucocutaneous manifestations. As found by Yosipovitch et al. and Sawhney et al. skin manifestation were more common in patient who had uncontrolled diabetes. Uncontrolled diabetes increases risk of development of microangiopathy and related complications.[13,14]

Out of all 200 patients 76% (152) patients were from urban background and 24% (48) patients were from rural background this was due to because diabetes mellitus affects mainly urban population with sedentary life style, specific dietary habits, lack of exercise and more obesity. Out of all 200 patients majority were graduate and matric, it shows diabetes mellitus affect adult population who is more literate and do less hard work like official works, business rather than illiterate people who resides in villages and work hard, has less obesity and other risk factors responsible for diabetes mellitus. Sedentary life style, stressful life, excessive intake of alcohol, high saturated fat intake, low dietary fiber, obesity are important risk factor for diabetes mellitus are more prevalent in urban population and literate population. Out of all 200 patients 36.5% (73) patients had positive family history. Out of 200 patients hypertension was observed in 35% (70) patients, diabetic retinopathy was observed in 21.5% (43) patient, diabetic nephropathy was observed in 6.5% (13) patients, hypothyroidism was observed in 12% (24) patients and hyperthyroidism was observed in 1.5% (3) patients. It shows high prevalence of systemic complication associated with diabetes mellitus. Similar high percentage (55.5%) of systemic complication associated in patient of mucocutaneous manifestation with diabetes also shown by Shemer et al.[15]

Among all 200 patients most common mucocutaneous manife stations of diabetes mellitus observed were fungal infections in 32.5% (65) cases and bacterial infections 21% (42) cases. It was probably due to overcrowding areas in Ajmer, poor personal hygiene and humid climatic conditions. Similar to our study Mahajan et al., Nawaf Al-Mutairi, Perez et al. has shown that infections are most common mucocutaneous manifestation associated with diabetes mellitus.[16,17,18] Other dermatoses associated with diabetes mellitus observed in our study were acanthosis nigricans 10.5% (21) cases, generalized pruritus 10.5% (21) cases, skin tags (acroch ord on) in 9.5% (19) cases, finger pebbles (sclerosis of finger) in 9% (18) cases, shin spots (Diabetic dermopathy) in 7% (14) cases. Acquired ichthyosis 6.5% (13) cases, rubeosi sfa ciei6.5% (13), xanthelasma 7% (14) cases, telogen effluvium 5% (10) cases, seborrheic keratosis, Periocular melanosis (POM), photodermatitis, urticaria each were present 4.5% (9) cases, Scleredema diabeticorum, melasma, post inflamm atory hyper pigmentation each was observed in 4% (8) cases, limited joint mobility of finger joints was observed in 3.5% (7) cases. Yasmin Bhat, RP Kudyar et al., and Paron, Lambert et al. has shown all above associations with diabetes in their studies similar to our study.[19,20]

Out of 200 patients diabetic foot ulcers due to neuropathy and microangiopathy were present in 3% (6) cases. Specific dermatosis shown association with diabetes mellitus in many studies likes diabetic bullae, necrobiosis lipoidica diabeti corum, granuloma annulare were present in our study respec tively in 0.5% (1) case,1.5% (3) cases, 2%(4) cases. Similar results have been shown by Tariq Mahmood et al.[21] Out of 200 patients 2.5% had alopecia areata, 2.5% had Lichen amyloi dosis, 1.5% had macular amyloidosis, 1.5% had vitiligo 1% had carbuncle and 1% had eruptive xanthomas. These manifestation also observed in some other studies like Nigam and Pandey.[22] Out of 200 cases some uncommon diseases were present in our study with insignificant frequency like SLE in 0.5%(1) cases, systemic sclerosis in 1% (2) cases, localized sclerosis Morphea in 1% (2) cases, psoriasis in 1.5% (3) cases, Lichen planus in 2%(4) cases, yellow palms in 0.5% (1) case and pterygium unguis inversus in 0.5% (1) case. Among all 200 cases, cases due to reaction of treatment of diabetes mellitus were observed in a few cases. Lipohyper trophy at injection site due to insulin was present in one case (0.5%), erythema multiforme like rash due to oral hypo glycemic drugs was present in one case (0.5%) and a few cases of photodermatitis were observed in our study. Among all 200 cases vesiculobullous disorder were present in 4 cases out which 2 cases (1%) were of pemphigus, 1(0.5%) case was of dermatitis herpetiformis and 1(0.5%) case of was dermatomyositis. Thus a variety of mucocutaneous manifes tations in diabetes had been observed in our study which helps to diagnose diabetes mellitus merely by careful inspection of skin.

CONCLUSION

The present study was undertaken to know the spectrum of cutaneous manifestations in diabetes mellitus. There are diverse mucocutaneous manifestations of diabetes mellitus of which some are specific and some are nonspecific. As cutaneous manifestations associated with diabetes can manifest prior to the diagnosis of diabetes and may reflect the glycemic control and other neurovascular complications, their knowledge to clinician will help in a more compre hensive management of diabetes and dermatoses and will also help in early diagnosis and prevention of complications of diabetes.

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