

Original research article

Assessment of the Pattern of Distribution of the Various Dermatological Lesions in Diabetic Retinopathy Patients

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Abstract

Aim: The purpose of this study was to investigate on the prevalence of dermatological lesions in patients with diabetic retinopathy.

Methods: This cross sectional study was done the Department of Ophthalmology, M.G.M. Medical College & Hospital, Jamshedpur, Jharkhand, India for 15 months. 100 patients with diabetic retinopathy having diabetes mellitus of at least 5 years duration, aged between 33-63 years, were included in this study. The dermatological examination was done by a dermatologist under proper day light and if needed, using hand held magnifying lens. Examination of the retina was done by an Ophthalmologist using indirect ophthalmoscopy of dilated fundus, fundus photo, fundus fluorescein angiography and optical coherence tomography of the macula.

Results: Of the 100 diabetic patients included in this study, 8(8%) had Very Mild Non Proliferative Diabetic Retinopathy (NPDR), 30 (30%) had Mild NPDR, 33 (33%) had Moderate NPDR, 10 (10%) had Severe NPDR, 11(11%) had Proliferative Diabetic Retinopathy (PDR) and 38 (38%) had Clinically Significant Macular Edema (CSME). Out of 79 patients, the most prevalent dermatological lesions noted. 39(39%) patients had diabetic dermopathy, 29 (29%) had Xerosis, 25 (25%) had IGH, 21 (21%) patients had Ichthyosis, 5(5%) patients had Intertrigo, 4 (4%) patients had Tinea Versicolor, 3 (3%) patients had Chronic Paronychia and 3 (3%) patients had Tinea Unguium. 2 (2%) patients had Eczema, 2 (2%) had Melasma, 2(2%) had Lichen Amyloidosis, 2 (2%) had Varicose vein, 1 (1%) had Fissure feet, 1(1%) had Pigmented Purpuric Dermatitis (PPD), 1 (1%) had Dermatitis Papulosa Nigra (DPN), 1 (1%) had Sclerodactyly, 1 (1%) had Plain warts, 1(1%) had Macular Amyloidosis, 1 (1%) had Cherry Aneurysm, 1 (1%) had Xanthelasma Palpebrarum, 1 (1%) had Photodermatitis, 1 (1%) had Skin tags, 1 (1%) had Onychomycosis, 1 (1%) had Onychogryphosis and 1 (1%) had Prurigo.

Conclusion: Prevalence of Dermatological lesions in Diabetic Retinopathy patients was 79%, the most common being Diabetic Dermopathy (shin spots) which was 39%.

Keywords: Diabetics, Retinopathy, Dermopathy

Introduction

South-East Asia accounts for more than 60% of the world's diabetes population.¹ The rapid rise in type 2 diabetes mellitus (T2DM) prevalence in Malaysia is alarming with 70 to 80% of patients having poor glycemic control.² Cutaneous manifestations of diabetes mellitus appear at disease onset, after the disease is established or precede diabetes by many years. A cutaneous condition is defined as any medical condition that affects the system enclosing the body, including the skin, hair, nails, and related muscle and glands.³ Cutaneous disorders due to T2DM are attributed to hyperglycemia which affects skin homeostasis resulting in altered

keratinocytes metabolism and collagen properties.^{4,5} Relative insulin deficiency in T2DM causes poor growth and differentiation of keratinocyte.^{4,5} Certain conditions such as skin tags and acanthosis nigricans are linked to hyperinsulinemia in the prediabetic state while bullous diabeticorum, diabetic dermopathy and scleroderma are more often seen in long standing T2DM.⁶ Microvascular complications, impaired wound healing and other undetermined mechanisms further contribute to cutaneous disease.⁷ Prevalence of dermatological disorders due to T2DM ranges from 36% to as high as 88.3%.^{8,9} Factors associated with cutaneous manifestations are poor glycemic control (HbA1c > 7%).¹⁰ and duration of diabetes.⁸ Longer disease duration have higher incidence of diabetic dermopathy.⁸ Profiling characteristics of T2DM and cutaneous manifestations may help in early diagnosis of diabetes, used as a surrogate marker for poor glycemic control and microvascular complications in other organs. Common cutaneous infections, staphylococcal infections, are more perilous and severe in patients with uncontrolled DM. Other types of infection include styes that cause tuberculosis of eyelid and also bacterial infection of the nails.¹¹ A fungus called *Candida albicans* is responsible for numerous fungal infections affecting diabetic patients; these infections are common in vaginal area and lips corners (angular cheilitis).¹¹ Candidiasis infection (moniliasis) can be considered as an early symptom of undiagnosed DM and localized candidiasis infection in the genital area of women has a strong relationship with DM.¹² Increasing the knowledge about cutaneous manifestations of DM can be associated with overall prognosis improvement of disease through the early diagnosis and treatment.¹³ According to various studies, 30-82% of DM patients experience different types of cutaneous disorder during the chronic course of their disease.^{6,14} Controlling the metabolism of the body may prevent some of these manifestations and also support the treatment.¹⁵ On the other hand, many glycemic control medications also have skin side effects.¹⁶

Material and methods

This cross sectional study was done in the Department of Ophthalmology, M.G.M. Medical College & Hospital, Jamshedpur, Jharkhand, India for 15 months, after taking the approval of the protocol review committee and institutional ethics committee. After taking informed consent detailed history was taken from the patient or relatives.

Methodology

100 patients with diabetic retinopathy having diabetes mellitus of at least 5 years duration, aged between 33-63 years, were included in this study. Patients suffering from ophthalmological conditions like hypertensive retinopathy, vascular occlusion and advanced cataract that may affect the findings were excluded from the study.

A questionnaire, which is semi structured was used to collect the data. The dermatological examination was done by a dermatologist under proper day light and if needed, using hand held magnifying lens. Examination of the retina was done by an Ophthalmologist using indirect ophthalmoscopy of dilated fundus, fundus photo, fundus fluorescein angiography and optical coherence tomography of the macula. Socio-demographic details of patients including name, age, sex, educational status and occupation, questions on diabetes mellitus like duration of diabetes, medications and associated conditions were included.

The collected data was entered in MS Excel software and was analysed using SPSS 25.0. The study protocol was approved by the Institutional ethical committee (ICE). Privacy and confidentiality of the patients were maintained and those detected to have any lesion were managed appropriately.

Results

100 patients who had DR were included in the study. The range of age was from 33 years to 63 years. The mean age was 55.62(SD 2.87) years. The duration of diabetes mellitus in this group was 5 to 30 years with a mean duration of 13.11 years (SD 3.29). Out of the 100 patients, 61% had some form of education of which, majority 67(67%) were housewives.

There was a slight female preponderance with 39 males (39%) and 61 females (61%) among the 100 patients. (Table 1)

Table 1 Gender distribution diabetic retinopathy

Gender	Number of patients	Percentage
Male	39	39
Female	61	61

Of the 100 diabetic patients included in this study, 8(8%) had Very Mild Non Proliferative Diabetic Retinopathy (NPDR), 30(30%) had Mild NPDR, 33(33%) had Moderate NPDR, 10(10%) had Severe NPDR, 11(11%) had Proliferative Diabetic Retinopathy (PDR) and 38(38%) had Clinically Significant Macular Edema (CSME).

Table 2. Distribution of diabetic retinopathy

	Number of patients	Percentage
Very mild NPDR	8	8
Mild NPDR	30	30
Moderate	33	33
Severe	10	10
PDR	11	11
Csme	38	38

32 patients (32%) were on Oral hypoglycemic agents (OHA), 17(17%) were on Insulin and 51(51%) were on both OHA & Insulin.

Only 40(40%) out of the 100 patients had good control of DM. 45(45%) out of 100 patients had Systemic Hypertension (HTN) along in addition to DM with a duration of 0.0777 (1 month) to 22 years with a mean duration of 3.65 years (SD 3.63).

79 among 100 DR patients had different types of dermatological lesions, the prevalence being 79%. Dermatological lesions among poor glycemic control DM patients had a prevalence of 50% which was higher as compared to 29% among good glycemic control DM patients.

Out of 79 patients, the most prevalent dermatological lesions noted. 39(39%) patients had diabetic dermopathy, 29(29%) had Xerosis, 25(25%) had IGH, 21(21%) patients had Ichthyosis, 5(5%) patients had Intertrigo, 4(4%) patients had Tinea Versicolor, 3(3%) patients had Chronic Paronychia and 3(3%) patients had Tinea Unguium. 2(2%) patients had Eczema, 2(2%) had Melasma, 2(2%) had Lichen Amyloidosis, 2(2%) had Varicose vein, 1(1%) had Fissure feet, 1(1%) had Pigmented Purpuric Dermatitis (PPD), 1(1%) had Dermatitis Papulosa Nigra (DPN), 1(1%) had Sclerodactyly, 1(1%) had Plain warts, 1(1%) had Macular Amyloidosis, 1(1%) had Cherry Aneurysm, 1(1%) had Xanthelasma Palpebrarum, 1(1%) had Photodermatitis, 1(1%) had Skin tags, 1(1%) had Onychomycosis, 1(1%) had Onychogryphosis and 1(1%) had Prurigo. Table 3 and 4 shows the gender distribution of Dermatological lesions among Diabetic Retinopathy patients.

Table 3: distribution of most prevalent Dermatological lesions among DR patients

Dermatological Lesions	Number of patients	Percentage
Diabetic dermopathy (shin spots)	39	39
Xerosis	29	29
IGH	25	25
Ichthyosis	21	21
Intertrigo	5	5
Tinea Versicolor	4	4
Chronic Paronychia	3	3
Tinea Unguium	3	3

Table 4: Distribution of less prevalent Dermatological lesions among DR patients

Dermatological Lesions	Number of patients	Percentage
Eczema	2	2
Melasma	2	2
Lichen Amyloidosis	2	2
Varicose veins	2	2
Fissure feet	1	1
PPD	1	1
DPN	1	1
Sclerodactyly	1	1
Plain warts	1	1
Macular Amyloidosis	1	1
Cherry Aneurysm	1	1
Xanthelasma Palpebrarum	1	1
Photodermatitis	1	1
Skin tags	1	1
Onychomycosis	1	1
Onychogryphosis	1	1
Prurigo	1	1

Discussion

Skin manifestations of T2DM vary in different parts of the world. An outline of common conditions and their etiology would help physicians manage T2DM patients in a holistic manner. We found a high prevalence of cutaneous manifestation of T2DM. The prevalence was similar to that in India, Pakistan and Hong Kong which is between 58 to 67%.¹⁷⁻¹⁹

Poor glycemic control might lead on to prolonged hyperglycemia. Prolonged hyperglycemia causes microcirculation and glycosylation of proteins which in turn results in complications in various organ systems of the body. Kidney, retina, nerves, and skin are the most commonly affected which manifests as renal failure, retinopathy, neuropathy and Diabetic dermopathy.^{20,21} In our study, Dermatological lesions among DR patients who had poor glycemic control had a prevalence of 50% which was higher as compared to 29% among good glycemic control patients.

Skin (Dermatological) disorders in DM can occur due to diabetic vascular abnormalities, cutaneous infections, treatment complications especially with Insulin, associated hyperlipidemia and other miscellaneous causes. Lesions like Diabetic dermopathy, erysipelas-like erythema, Diabetic rubeosis, leg ulcers and wet gangrene of the foot are due to vascular

abnormalities. Non clostridial gas gangrene, candida albicans etc. are due to cutaneous infections. Insulin reactions can lead on to insulin lipodystrophy and associated hyperlipidemia can cause acanthosis nigricans, eruptive xanthomas and skin tags. Other manifestations like diabetic bullae, pruritis, waxy skin, scleroderma diabeticorum, vitiligo, lichen planus etc. are also noticed in DM.²²

In our cross sectional study, 100 patients with DR were included, who all had suffered from type 2 DM for at least 5 years. Prevalence of dermatological lesions among these patients was found to be 79%, and the most Prevalent Dermatological lesion was Diabetic dermopathy (shin spots) which was 39(39%) patients had diabetic dermopathy, 29(29%) had Xerosis, 25(25%) had IGH, 21(21%) patients had Ichthyosis, 5(5%) patients had Intertrigo, 4(4%) patients had Tinea Versicolor, 3(3%) patients had Chronic Paronychia and 3(3%) patients had Tinea Unguium. George and Walton also reported that Diabetic dermopathy (diabetic shin spots) is the commonest skin condition that occurs in patients with DM.²³ A study conducted among 125 DM patients by Kalsy et al found that the most frequent skin lesions was diabetic dermopathy.²⁴ In another study done by Chatterjee et al among 490 Type 2 diabetics, infections, Xerosis, hair loss beneath the knees and diabetic dermopathy were the most frequent.²⁵ A thorough search of literature could not give any studies which investigated on the prevalence of diabetic dermatological lesions in DR patients. Though both DR and Dermatological lesions are considered to be the complications of DM, we could not demonstrate the exact nature of association between these two in our study and further studies are required to do so.

Conclusion

Prevalence of Dermatological lesions in Diabetic Retinopathy patients was 79%, the most common being Diabetic Dermopathy (shin spots) which was 39%.

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