

OBSERVATIONAL STUDY OF CUTANEOUS MANIFESTATIONS AMONG PATIENTS OF DIABETES MELLITUS

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ABSTRACT

Background: Cutaneous manifestations sometimes may be the first presenting clinical sign of diabetes mellitus but more commonly manifest in known diabetic Mellitus patients during the time period of the disease as reported in previous studies among 45-65% of diabetic Mellitus patients. Abnormalities in carbohydrate metabolism along with atherosclerosis, neuropathy, impaired host immunity, and microangiopathy all together act in the etiopathogenesis of cutaneous manifestations in known diabetic Mellitus patients. **Material & Methods:** The present prospective study was conducted at the Department of Dermatology of our tertiary care hospital. Patients were enrolled from the outdoor and the ward by simple random sampling. Clearance from Institutional Ethics Committee was taken before the start of the study. Written informed consent was taken from each study participant. All known diabetic Mellitus patients irrespective of age, gender, duration of illness, and associated complications were enrolled in the present study.: **Results.** In the present study, based on cutaneous manifestations, out of the total majority of study participants, 61% had cutaneous infections which were followed by 40 % patients had dermatosis more commonly associated with diabetes which was followed by 26 % of patients who had Nonspecific cutaneous manifestations which were followed by 6 % patients had Dermatitis associated with microangiopathy which was followed by 4 % patients had Neuropathic and ischemic diabetic skin disease which was followed by 4 % patients had Metabolic disease manifestations. **Conclusion:** We concluded from the present study that cutaneous infections were the most common cutaneous manifestations in diabetics Mellitus patients which were followed by dermatoses most commonly reported with diabetes mellitus patients.

Keywords: cutaneous manifestations, skin disease, diabetes.

INTRODUCTION

In 2016, WHO reports that diabetes was directly responsible for 1.6 million mortality occurred worldwide (1). In India, the prevalence of diabetes is increasing and imposing challenges on the health care infrastructure of the country (2). Diabetes is a chronic disease in etiology and occurs when the pancreas does not produce enough amount of insulin or when there is resistance towards its action on the body (3). It is well known that insulin resistance at peripheral tissues (muscular tissue and adipose) plays a key role in the glucose metabolism disturbance in diabetes. Previous studies reported

that chronic inflammation also leads to the occurrence of insulin resistance (4).

The prevalence of non-communicable diseases is increasing compared to communicable diseases. Among the non-communicable diseases, diabetes mellitus is rapidly increasing globally and affecting all age groups (5).

In 2014, WHO reports that 8.5% of adults aged 18 years or above had been diagnosed with diabetes. It was estimated that by the year 2030 diabetes will become the seventh leading cause of mortality worldwide. The etiopathology of hematogenous

diabetes is complex and it is not precisely reported in previous studies but porto-systemic shunting of insulin reported in systemic hyperinsulinemia which leads to subsequent downregulation of insulin receptors which results in insulin resistance (6).

Cutaneous manifestations sometimes may be the first presenting clinical sign of diabetes mellitus but more commonly manifest in known diabetic Mellitus patients during the time period of the disease as reported in previous studies among 45-65% of diabetic Mellitus patients (7).

Abnormalities in carbohydrate metabolism along with atherosclerosis, neuropathy, impaired host immunity, and microangiopathy all together act in the etiopathogenesis of cutaneous manifestations in known diabetic Mellitus patients (8).

The present study was conducted to evaluate the insulin resistance and cutaneous manifestations among patients of diabetes mellitus at our tertiary care center.

MATERIALS & METHODS

The present prospective study was conducted at the Department of dermatology of our tertiary care hospital. The study duration was January 2019 to September 2019. A sample size of 100 was calculated at a 95 % confidence interval at a 10 % acceptable margin of error by epi info software version 7.2. Patients were enrolled from the outdoor and the ward by simple random sampling. Written informed consent was taken from each study participant. All known diabetic Mellitus patients irrespective of age, gender, duration of illness, and associated complications were enrolled in the present study.

All the study participants were subjected to the recording of demographic details as per the proforma. Pregnant mothers were excluded from the present study. All the study participants were subjected to routine blood and urine investigations such as CBC, ESR, RBS, FBS, HbA1c urine routine and microscopy, and for cutaneous manifestations, Potassium hydroxide mount, Bacterial and fungal culture, Gram staining, and Skin biopsy was done.

All the data was recorded on a Microsoft Excel spreadsheet and data analysis was done at 5% alpha and 95% confidence interval using SPSS v22 software. Test of significance was applied on collected and organized data and a p-value less than 0.05 was considered as a statistically significant association between study variables.

RESULTS

In the present study, we enrolled 100 patients of known diabetic Mellitus irrespective of age, gender, duration of illness, and associated complications. Clearance from Institutional Ethics Committee was taken before the start of the study. Written informed consent was taken from each study participant. Study participants were enrolled from the outdoor and the ward by simple random sampling. The age of study participants was ranged from 30 years to 76 years. The mean age of cases was 48.4 ± 2.9 years. Out of the total study participants, it was reported that males 54% were likely affected more than females 46%. The mean BMI of cases was 26.6 ± 3.47 . A family history of diabetes mellitus was present in 72 % of patients. The mean duration of diabetes among study participants was 5.8 ± 2.1 years. (Table 1)

Table 1: Distribution of study subjects according to age, gender, and BMI.

Study parameters		
Mean age	48.4 ± 2.9 years	
Gender	Male	54%
	Female	46%
BMI (Kg/m²)	26.6 ± 3.47	
Family history of diabetes mellitus	72 % patients	
Mean duration of DM (years)	5.8 ± 2.1 years	

In the present study, based on cutaneous manifestations, out of the total majority of study participants, 61% had cutaneous infections which were followed by 40 % patients who had dermatosis more commonly associated with diabetes which was followed by 26 % of patients who had Nonspecific cutaneous manifestations which were followed by 6 % patients had Dermatitis associated with microangiopathy which was followed by 4 % patients had Neuropathic and ischemic diabetic skin disease which was followed by 4 % patients had Metabolic disease manifestations. (Table 2)

Table 2: Distribution according to cutaneous manifestations.

The pattern of cutaneous manifestations	No. of patients
Cutaneous infections	61
Dermatosis more commonly associated with diabetes	40
Nonspecific manifestations	26
Dermatosis associated with microangiopathy	6
Neuropathic and ischemic diabetic skin disease	4
Metabolic disease manifestations	4

DISCUSSION

In the present study, we enrolled 100 patients of known diabetic Mellitus irrespective of age, gender, duration of illness, and associated complications. Clearance from Institutional Ethics Committee was taken before the start of the study. Written informed consent was taken from each study participant. Study participants were enrolled from the outdoor and the ward by simple random sampling. The age of study participants was ranged from 30 years to 76 years. The mean age of cases was 48.4 ± 2.9 years. Out of the total study participants, it was reported that males 54% were likely affected more than females 46%. The mean BMI of cases was 26.6 ± 3.47 . A family history of diabetes mellitus was present in 72 % of patients. The mean duration of diabetes among study participants was 5.8 ± 2.1 years. Similar results to the present study were obtained in a study conducted by Deep HS et al among 100 patients diagnosed with diabetes mellitus. They reported Insulin resistance was observed in 79 patients out of 100 patients. The p-value is <0.001 which is statistically highly significant (9).

In the present study, based on cutaneous manifestations, out of the total majority of study participants, 61% had cutaneous infections which were followed by 40 % patients had dermatosis more commonly associated with diabetes which was followed by 26 % of patients who had Nonspecific cutaneous manifestations which were followed by 6

% patients had Dermatitis associated with microangiopathy which was followed by 4 % patients had Neuropathic and ischemic diabetic skin disease which was followed by 4 % patients had Metabolic disease manifestations. A similar result to the present study was obtained in a study conducted by Shivanna R et al among 500 patients diagnosed with cutaneous manifestations of diabetes mellitus. They reported similar results to the present study (10)

Similar results to the present study were obtained in a study conducted by Khuraiya S et al among 300 patients diagnosed with cutaneous manifestations of diabetes mellitus. They reported the majority of patients belonged to the 40-50 years (33%) and 30-40 years (27.7%). Males were 65% male to female ratio was 1.8:1. Among the 300 patients, 24.3% had good control of DM while 44% of patients had poor control of DM. Hypertension was the most commonly reported systemic illness. Cutaneous infections were the most commonly observed manifestation (63%) of which (35.3%) had fungal infections. Some of the other dermatoses reported were generalized pruritus (15.3%), acanthosis nigricans (6%), acrochordons (11%), diabetic dermopathy (5.33%), peripheral vascular disease (2.66%), diabetic foot (3%), vitiligo (2.66%), diabetic bullae (1%), xanthelasma palpebrarum (2.33%). dermatoses associated with microangiopathy and Cutaneous infections were more commonly reported in the uncontrolled diabetic Mellitus patients which were statistically significant (11).

CONCLUSION

We concluded from the present study that cutaneous infections were the most common cutaneous manifestations in diabetics Mellitus patients which were followed by dermatoses most commonly reported with diabetes mellitus patients. Proper dermatological care and long-term good control of blood sugar levels reduce the risk of cutaneous infections and other common cutaneous manifestations in diabetics Mellitus patients. Thus, dermatologists play an important role in combating dermatologic morbidity and improving the quality of life of diabetics Mellitus patients.

Declarations

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. León LE, Rani S, Fernandez M, Larico M, Calligaris SD. Subclinical detection of diabetic cardiomyopathy with microRNAs: challenges and perspectives. *J Diabetes Res.* 2016 Dec 6;2016:6143129. doi: [10.1155/2016/6143129](https://doi.org/10.1155/2016/6143129), PMID [26770988](https://pubmed.ncbi.nlm.nih.gov/26770988/).
2. Tracy JA, Dyck PJB. The spectrum of diabetic neuropathies. *Phys Med Rehabil Clin N Am.* 2008 Feb;19(1):1-26, v, v. doi: [10.1016/j.pmr.2007.10.010](https://doi.org/10.1016/j.pmr.2007.10.010), PMID [18194747](https://pubmed.ncbi.nlm.nih.gov/18194747/).
3. American Diabetes Association AD. Diagnosis and classification of diabetes mellitus. *Diabetes Care.* 2009 Jan;32(Supplement_1);Suppl 1 [Suppl:S62-7]:S62-7. doi: [10.2337/dc09-S062](https://doi.org/10.2337/dc09-S062).
4. Garcia-Compean D, Jaquez-Quintana JO, Gonzalez-Gonzalez JA, Maldonado-Garza H. Liver cirrhosis and diabetes: risk factors, pathophysiology, clinical implications and management [Internet]. *World J Gastroenterol.* 2009;15(3):280-8. doi: [10.3748/wjg.15.280](https://doi.org/10.3748/wjg.15.280), PMID [19140227](https://pubmed.ncbi.nlm.nih.gov/19140227/). Available from: [/pmc/articles/PMC2653324](https://pubmed.ncbi.nlm.nih.gov/pmc/articles/PMC2653324/).
5. Gupta A, Chaturvedi P, Shrivastava SK, Dubey PK. Glitazones for the treatment of diabetes Type-2. *Asian J Res Chem.* February 2012;5(2):164-70. Available from: <https://ajrconline.org/AbstractView.aspx?PID=2012-5-2-2>
6. Kawaguchi T, Taniguchi E, Itou M, Sakata M, Sumie S, Sata M. Insulin resistance and chronic liver disease [internet]. *World J Hepatol.* 2011;3(5):99-107. doi: [10.4254/wjh.v3.i5.99](https://doi.org/10.4254/wjh.v3.i5.99), PMID [21731901](https://pubmed.ncbi.nlm.nih.gov/21731901/). Available from: [/pmc/articles/PMC3124882](https://pubmed.ncbi.nlm.nih.gov/pmc/articles/PMC3124882/).
7. Phulari YJ, Kaushik V. Study of cutaneous manifestations of type 2 diabetes mellitus. *Int J Res Dermatol.* 2018 Jan 23;4(1):8. doi: [10.18203/issn.2455-4529.IntJResDermatol20175544](https://doi.org/10.18203/issn.2455-4529.IntJResDermatol20175544).
8. Timshina DK, Thappa DM, Agrawal A. A clinical study of dermatoses in diabetes to establish its markers. *Indian J Dermatol.* 2012 Jan;57(1):20-5. doi: [10.4103/0019-5154.92671](https://doi.org/10.4103/0019-5154.92671), PMID [22470203](https://pubmed.ncbi.nlm.nih.gov/22470203/).
9. Deep HS, Babbar N, Mahajan DS. Prevalence of insulin resistance in cirrhosis of liver. *Int J Adv Med.* 2018;5(2):375-9. doi: [10.18203/2349-3933.ijam20181072](https://doi.org/10.18203/2349-3933.ijam20181072).
10. Raganatha S, Anitha B, Inamadar AC, Palit A, Devarmani SS. Cutaneous disorders in 500 diabetic patients attending diabetic clinic. *Indian J Dermatol.* 2011 Mar;56(2):160-4. doi: [10.4103/0019-5154.80409](https://doi.org/10.4103/0019-5154.80409), PMID [21716540](https://pubmed.ncbi.nlm.nih.gov/21716540/).
11. Khuraiya S, Lal N, N, Jain V, Kachhawa D. A cross sectional study of cutaneous manifestations in 300 patients of diabetes mellitus. *Int J Adv Med.* 2019;6(1):150. doi: [10.18203/2349-3933.ijam20190122](https://doi.org/10.18203/2349-3933.ijam20190122).

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