

Original Research Article

Screening of diabetes mellitus in patients at risk in dermatology outpatient department

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ABSTRACT

Background: Type 2 diabetes mellitus (T2DM) is a widely spread multidisciplinary condition that requires the attention of many different disciplines; yet, the involvement of dermatologists in this regard has not been recognized. The current study focused on the role of dermatologists in screening the prevalence and pattern of cutaneous manifestations in diabetic and pre-diabetic patients.

Methods: A randomized study was carried out from April 2023 to October 2023 in the department of dermatology at SSB Heart and Multispecialty Hospital in Faridabad, Haryana. In the current study, patients with dermatological problems suspected of diabetes mellitus were enrolled. Dermatological problems such as acanthosis nigricans, dermatophyte infections, psoriasis, endogenous eczema, chronic urticaria, generalized pruritus, lichen simplex chronicus, patients older than 40, and coexisting conditions like obesity were focused in this study.

Results: This study enrolled a total of 100 patients. Only 37 patients were recognized as having a high risk of diabetes, with 67.57% having a verified history of the disease. Furthermore, 32% of T2DM patients were examined for specific skin symptoms during their initial visits, with 4 individuals being found to have generalized pruritus and dermatophyte infection.

Conclusions: This study finally concluded that dermatologists may play a crucial role in fighting the T2DM epidemic by early detection of T2DM and treatment initiation which may reduce the risk of serious complications.

Keywords: Diabetes mellitus, Skin manifestation, Screening, Prevention

INTRODUCTION

Type 2 diabetes mellitus (T2DM) is the most common endocrine disorder in the world. It is anticipated that there will be 592 million diabetic patients by 2035. According to the International Diabetes Federation, more than 70% of patients with type 2 diabetes will live in developing nations by 2030.¹ This might be due to increased urbanization, along with dietary changes, lower physical activity, and changes in other lifestyle behaviors, as well as rising obesity rates.²

Moreover, T2DM is also a prevalent and debilitating condition that produces a variety of severe renal, vascular,

and ocular consequences; the skin may be damaged by diabetes-related diseases or by diseases with unproven links.² The skin plays an important role in metabolic and endocrine activities. Insulin impacts various regions of the skin and is essential for the growth and differentiation of creatine cells in culture medium, as well as the regulation of glucose entrance into skin cells.³ Skin manifestations in diabetes patients are caused by metabolic damage and chronic degenerative consequences of diabetes, changes in lipid profile, glycosylation of proteins, and their deposition.⁴ These dermatologic symptoms have a range of health implications, from aesthetically troublesome to potentially life-threatening. T2DM cutaneous symptoms might provide information about a patient's current or

previous metabolic condition. Recognition of such symptoms may aid in the diagnosis of diabetes or serve as a glycemic control marker.⁵

T2DM is a widely widespread multidisciplinary condition that requires the attention of many different specializations; dermatologists may play a significant role in combating this epidemic. Efforts to identify and screen high-risk patients can enhance early detection of diabetes and aid in the identification of prediabetic patients, which is acknowledged as a critical component in diabetes prevention. Three major aspects make the dermatologist's potential impact on the diabetes epidemic more feasible and crucial than ever. First, dermatologists frequently treat patients who have or are at risk of developing diabetes. Patients with cutaneous signs of diabetes, such as acanthosis nigricans, are included, as are patient populations at elevated risk for diabetes, such as those with psoriasis, hidradenitis suppurativa, and polycystic ovarian syndrome.^{6,7} Second, dermatologists can apply basic screening protocols to identify diabetic patients.⁸ Patients who are at high risk can then be screened with a single non-fasting blood test. Third, recognizing prediabetes is critical in T2DM prevention because therapies have been proven to significantly limit the progression to T2DM. In addition to referring patients with prediabetes to a primary care physician (PCP), dermatologists may refer them to diabetes prevention programs and behavioral lifestyle intervention programs that are both cost-efficient and effective.⁹ As a result, having a comprehensive understanding of the dermatological manifestations of diabetes mellitus may aid in the overall prognosis improvement of the condition through early identification and treatment.

However, the significance of dermatologists' knowledge in this matter has not been emphasized. The current study looks at dermatologists' roles in assessing the prevalence and pattern of skin manifestations in diabetic and pre-diabetic patients.

METHODS

At the dermatology department of the SSB Heart and Multispecialty Hospital in Faridabad, Haryana, a randomized study was planned from April 2023 to October 2023. The aforementioned hospital's Medical Ethics Committee gave its approval to the study. In this study a total of 100 (both male and female) participants over 40 years old with suspected diabetes mellitus were included. Participants were required to provide informed consent, understand instructions, and fully comply with the study procedure. Dermatological problems such acanthosis nigricans, dermatophyte infections, psoriasis, endogenous eczema, chronic urticaria, generalized pruritus, lichen simplex chronicus and coexisting conditions like obesity were all included in this study. The exclusion criteria were the presence of a single fungal infection episode without any diabetes risk factors and patients unable to provide

informed consent. Clinical data were evaluated using Microsoft excel 2021 for data mining.

RESULTS

A total of 100 patients were enrolled in this study during the proposed period (Table 1). Table 2 represents patient distribution according to risk parameters. All enrolled patients were found to have dermatological problems, out of which only 37 patients were identified with a high risk of T2DM (Figure 1). In identified high-risk patients, a total of 67.57% of patients had a proven history of T2DM while 32.43% were not diagnosed with T2DM previously.

Table 1: Demographic characteristics of T2DM patients.

Characteristics	Number of patients
Age (years)	
40-50	24
50-60	39
60-70	31
>70	6
Gender	
Female	37
Male	63
Residential area	
Urban	71
Rural	29
Obesity (body mass index (BMI)* >27 kg/m²)	55

Table 2: Patient distribution according to risk parameters.

S. no.	Parameters	No. of patients
1	Patients at high risk	37
2	Patients at moderate risk	25
3	Diagnosed with dermatological problems at subsequent visits	19
4	Diagnosed with dermatological problems at 1 st visit	4
Total		100

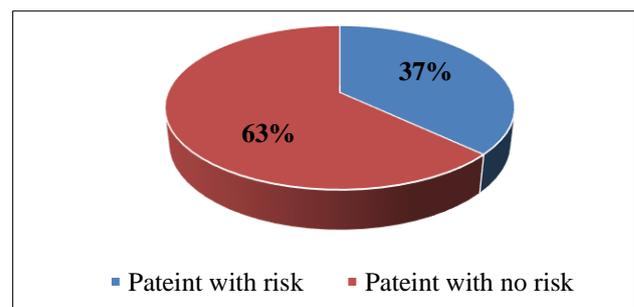


Figure 1: Total percentage of T2DM patient with dermatological manifestations.

Further, a total of 32% patients of with T2DM were screened out for particular skin manifestations in the first visits (Figure 2), out of which a total of 4 patients were found to have generalized pruritus and dermatophyte infection. Moreover, these dermatophyte infections were only observed above the age of 50 (Table 3).

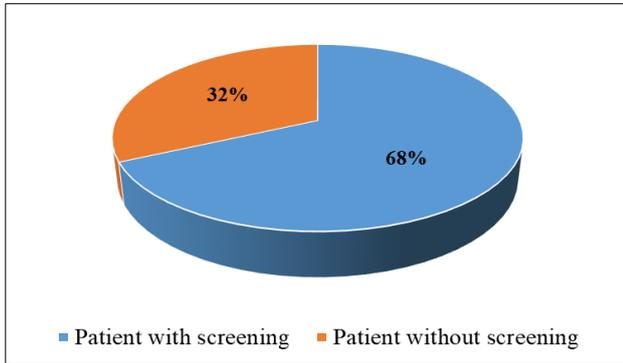


Figure 2: Total percentage of patient with dermatological manifestations in first visit.

Table 3: Number of patients with dermatological manifestations on first visit.

Dermatological manifestation	Number of positive patients
Generalized pruritus	4
Endogenous eczema	2
Dermatophyte infection	4
Psoriasis	1
Recurrent dermatophyte infection	1

DISCUSSION

According to the majority of published research, the incidence of cutaneous conditions linked to diabetes ranges from 30% to 71.^{10,11} In this study, 37% of patients with one or more cutaneous symptoms had a greater risk of diabetes, indicating that cutaneous manifestations have a somewhat positive connection with diabetes. A similar trend of cutaneous manifestations was also recorded in previous studies.¹² According to Rao and Pai, a variety of variables, such as aberrant carbohydrate metabolism, other altered metabolic pathways, microangiopathy, atherosclerosis, neuron degeneration, and compromised host defense mechanisms, might cause the cutaneous symptoms of diabetes mellitus.¹³ Furthermore, George and Fernandez's, also revealed that T2DM which impacts every organ in the human body, also affects the skin, with unpredictable cutaneous symptoms.¹⁴

The present study also revealed that a total of 32% of T2DM patients were screened out for particular skin manifestations in the first visits. Diagnosing prediabetes is essential to preventing diabetes since treatments can significantly slow the onset of the disease and suggest that

dermatologists play a significant role in managing diabetes. Dermatologists may immediately refer these patients to diabetes preventive programs, which are organized behavioral lifestyle intervention programs. Current research shows that there is a need for improvement in diabetes screening and prevention among patient groups including those with psoriasis, as a major section of the population does not receive routine care from a primary care physician.¹⁵

Limitations

The limitation of the present study, the sample size was too small to demonstrate significant impact of different dermatological problems and the small follow up period, and a larger sample size may be necessary to fully define the association of T2DM with dermatological problems.

CONCLUSION

Finally, this study found that by identifying T2DM early and starting treatment, dermatologists may be able to significantly contribute to the fight against the current T2DM epidemic. It might lessen the possibility of major issues. This study will provide insight into the importance of dermatologists in T2DM management in elderly population.

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