

A STUDY ON CUTANEOUS FUNGAL DISORDERS IN DIABETES MELLITUS

Sampath Kumar G¹, Mohammad Faizal², Radhamani M³

¹Professor and HOD, Department of Dermatology, Travancore Medical College, Kollam.

²Assistant Professor, Department of Dermatology, Travancore Medical College, Kollam.

³Associate Professor, Department of Dermatology, Travancore Medical College, Kollam.

ABSTRACT

BACKGROUND

Skin problems are usually not considered and never attended in diabetics. They are usually neglected and they are only taken note of when they pose problems. Many of these skin problems that go undiagnosed diabetic patients later complicate diabetes and its treatment. The common skin infections that can cause major problems and are associated with increased blood glucose levels and Advanced Glycation Products (AGPs). Skin disorders in diabetics are usually consistent as in the medical literature, but the data is limited with respect to early stage skin disorders in diabetic patients. Awareness is needed for better understanding the importance of skin disorders in diabetes patients for prevention and management.

MATERIALS AND METHODS

This study was done in the Department of Dermatology, Travancore Medical College, Kollam. The study was done from June 2015 to December 2015. Sixty patients were identified and the study was conducted.

INCLUSION CRITERIA

The patients were known diabetic for at least five years.

EXCLUSION CRITERIA

Patients who were treated with immune suppressant drugs were not included in the present study. Skin scrapings were taken and were subjected to KOH preparation. The result that was available was taken for statistical analysis. The statistical analysis was done using the latest SPSS software 2015 (California).

RESULTS

In the present study, maximum number of fungal infections was seen in male sex, which amounted to forty one cases and was as in the female sex the number was nineteen. Out of the forty one male cases, maximum number of cases belonged to age group of forty to sixty years, which amounted to sixteen cases followed by age group sixty to eighty years, which amounted to fourteen cases followed by twenty to forty years, which amounted to seven cases. Age group zero to twenty years and age group of more than eighty years amounted to two cases each. In cases of females, age group forty to sixty years had maximum number of cases, which amounted to seven in number followed by sixty to eighty years, which amounted to five in number followed by age group of twenty to forty years, which amounted to four cases, followed by more than eighty years, which amounted to two cases. Least number of cases was seen in age group of zero to twenty years, which amounted to one case. Based on the type of fungal infections, total of twenty four patients suffered from tinea pedis infection out of which seventeen were males and seven were females. Eleven patients suffered from onychomycosis, out of which, ten were males and one was female. A total of four patients suffered from Candidal skin infection, out of which three were males and one was female. Four patients suffered from Candida angular cheilitis out of which male and female amounted to two cases each. Six males were noted to have Candidal balanitis and three females suffered from vaginal yeast infections. A total number of eight patients suffered from Candidal intertrigo out of which three cases were males and five cases were female.

CONCLUSION

Fungal infections, which are usually seen in the moist areas of the body are a common problem with diabetics and elderly. The study proves that in known diabetic patients of more than five years it is quiet common.

KEYWORDS

Diabetes, Tinea, Candida, Vaginal Yeast Infections, Onychomycosis.

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Corresponding Author:

Dr. Radhamani M,

*Associate Professor, Department of Dermatology,
Travancore Medical College, Kollam.*

E-mail: radhamani@rediffmail.com

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INTRODUCTION: Skin problems are usually not considered and never attended in diabetics. They are usually neglected and they are only taken note of when they pose problems. Many of these skin problems that go undiagnosed diabetic patients later complicate diabetes and its treatment. The common skin infections that can cause major problems and are associated with increased blood glucose levels and Advanced Glycation Products (AGPs).^[1] Skin disorders in diabetics are usually consistent as in the medical literature, but the data is limited with respect to early stage skin disorders in diabetic patients.^[2] Awareness is needed for better understanding the importance of skin disorders in diabetes patients for prevention and management. Diabetes Mellitus (DM) is non-infectious disease with a high prevalence accounting for a very high rates of morbidity and mortality. Two years back in 2014, the prevalence of diagnosed DM was 387 million and a reported worldwide deaths accounting to 4.9 million. DM has taken a serious toll in the developing countries and the less developed countries where the prevalence comes close to 77% and has become a major health problem.^[3] Even with a high prevalence of DM, data on skin complications is limited. Several studies of skin disorders have been done worldwide and the pattern varies with the type of DM and the geographical variation. The prevalence of cutaneous disorders in DM varied from 50 to 95% in different studies worldwide.

Skin disorders in DM patients are related very much to the glycaemic control exercised. In those with inadequate glycaemic control, 94% of them had some skin conditions whereas only 60% of DM patients with adequate control had skin manifestations.^[4] DM affects skin by several ways, hyperglycaemia and AGPs, the most documented ones. High levels of blood sugars affect skin homeostasis by inhibiting protein biosynthesis by halting keratinocyte differentiation, proliferation and migration, induction of endothelial cell apoptosis, reducing endogenous nitric oxide synthesis, impairing phagocytosis and chemotaxis.^[5,6] Hyperglycaemia can induce direct damage and also induce AGPs formation. AGP formed act in several cellular pathways producing reactive oxygen species that can damage the skin from inside.^[6] Cutaneous fungal infections are seen commonly in DM patients who have a poor glycaemic control. They can be caused by the spread of true fungus or sac-like yeast. Yeast infections lead to areas of itchy, red, swollen skin surrounded by blisters or dry scales. At times, the skin may be covered by white discharge resembling "Cottage Cheese". Yeast survives well in areas like the warm skin folds underneath the breasts, the groin, armpits, oral cavity, the angle of mouth and underneath the foreskin.

True fungal infections are popularly known as ringworm, jock itch and Athlete's foot. If left untreated, they cause itching, which is the common symptom and spread to worsen the morbidity of the patient.

Following are some common superficial skin infections caused by fungus.

1. Tinea pedis.
2. Onychomycosis.
3. Candidal infections.
4. Candida angular cheilitis.
5. Candidal balanitis.
6. Candidal intertrigo.
7. Vaginal yeast infection.

Candida species are well-known opportunistic pathogens, which are also the normal human commensal. They were identified first as a cause of oral cavity lesions in the 1840s. Incidence of Candida infections has increased dramatically. They have significantly contributed to mortality in immunocompromised patients including DM patients. Candida organisms are oval microscopic yeasts (4-6 μm) having thin wall and reproduce by budding. Of the 150 Candida spp., only about 10 are pathogenic to humans. Breakdown of human immune defence system is essential for Candida to be pathogenic.

This study is undertaken to see the pattern of cutaneous fungal infections in type 2 diabetes mellitus to enrich literature with data to help in effective management of diabetes mellitus as well as fungal infections.

AIMS AND OBJECTIVES: To study the patterns of cutaneous fungal infections in diabetes mellitus.

MATERIALS AND METHODS: This study was done in the Department of Dermatology, Travancore Medical College, Kollam. The study was done from June 2015 to December 2015. Sixty patients were identified and the study was conducted.

Inclusion Criteria: The patients were known diabetic for at least five years.

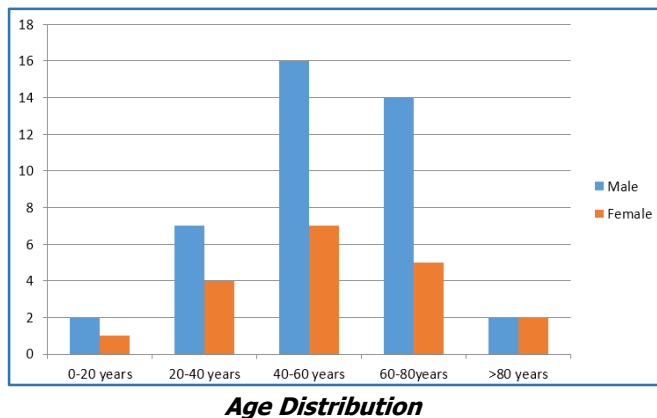
Exclusion Criteria: Patients who were treated with immune suppressant drugs were not included in the present study.

Skin scrapings were taken and were subjected to KOH preparation. The result that was available was reported.

RESULTS:

Male	Female
41	19

Table 1: Gender Distribution



Type	Male	Female
Tinea pedis	17	7
Onychomycosis	10	1
Candidal	3	1
Candida angular cheilitis	2	2
Candidal balanitis	6	--
Candidal intertrigo	3	5
Vaginal yeast infection	--	3

Table 2: Types of Fungal Infection

DISCUSSION: In the present study, maximum number of fungal infections was seen in male sex, which amounted to forty one cases and was as in the female sex the number was nineteen. Out of the forty one male cases, maximum number of cases belonged to age group of forty to sixty years, which amounted to sixteen cases followed by age group sixty to eighty years, which amounted to fourteen cases followed by twenty to forty years, which amounted to seven cases. Age group zero to twenty years and age group of more than eighty years amounted to two cases each. In cases of females, age group forty to sixty years had maximum number of cases, which amounted to seven in number followed by sixty to eighty years, which amounted to five in number followed by age group of twenty to forty years, which amounted to four cases followed by more than eighty years, which amounted to two cases. Least number of cases was seen in age group of zero to twenty years, which amounted to one case.

Based on the type of fungal infections, total of twenty four patients suffered from tinea pedis infection out of which seventeen were males and seven were females. Eleven patients suffered from onychomycosis, out of which, ten were males and one was female. A total of four patients suffered from Candidal skin infection, out of which, three were males and one was female. Four patients suffered from Candida angular cheilitis, out of which, male and female amounted to two cases each. Six males were noted to have Candida balanitis and three females suffered from vaginal yeast infections. A total number of eight patients suffered from Candida intertrigo, out of which, three cases were

males and five cases were female. According to a study conducted by Abilash et al,⁷ the following were noted.

Among the 100 patients, the youngest patient was a 31 year old and the eldest was a 72 year old. There were seven patients in the age group of 30-39 years, 25 patients in the age group of 40-49, 35 patients in the age group of 50-59, 28 patients in the age group of 60-69 and 5 patients in the age group of 70-79. The highest incidence was in the age group of 5th decade. There were total of 18 females and 82 male patients. Among the 100 patients, 18 had positive fungal cultures - 12 males and 6 females. Among the 18 fungal cultures, Candida species of fungal isolates were predominant; specifically, strains of Candida albicans - 16 samples and Candida tropicalis - 2 samples. Sex distribution of patients positive for C. albicans strains. Sex distribution of patients positive for C. tropicalis strains. Among the 100 patients studied, 13 patients had type 2 diabetes mellitus for less than 5 years and 32 patients had diabetes mellitus for 5-10 years, 10 patients had diabetes for 10-15 years, 12 patients had diabetes mellitus for 16-20 years and 33 patients had diabetes mellitus for more than 20 years. Among the 100 patients, 76 were smokers and 68 were alcoholics. Our study is in agreement with the study done by the Abilash et al.⁷

CONCLUSION: Fungal infections which are usually seen in the moist areas of the body are a common problem with diabetics and elderly. The study proves that in known diabetic patients of more than five years, it is quiet common. Special care must be taken in such cases and proper education must be given to the diabetic patients so that they can avoid such infections.

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