

Original Research Article

Cutaneous fungal infections in subjects with diabetes mellitus

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ABSTRACT

Background: Diabetes mellitus is a chronic non-communicable disease causing an increase in blood glucose levels due to an ineffectiveness or insufficiency of secreted insulin. Infections have also been shown to be the most common skin changes in diabetics. In our study we aim to assess the susceptibility of diabetics to various superficial fungal infections. We will study candidiasis, tinea versicolor and dermatophytic infections in diabetics.

Methods: 400 diabetic individuals who gave consent were chosen at random from the patients attending the OPD. They were subjected to thorough clinical evaluation. Routine hematological investigations were done. FBS, PPBS, and HBA1C were done to assess diabetic control. Fungal infections were confirmed by KOH mounts.

Results: Of the 400 subjects 220 were male and 180 were female. 52.5% of the subjects had some fungal infections. 55.2% of the fungal infections were candidiasis. 27.6% of the fungal infections were dermatophytic infections. 17.1% of the fungal infections were tinea versicolor infections.

Conclusions: The study has analysed the epidemiology of cutaneous fungal infections in diabetics. A little over half the diabetics studied proved to have cutaneous fungal infections. Candidiasis was the most frequent form of cutaneous fungal infections accounting for 57% of the fungal infections. Dermatophytic infections were seen in 28% of infections and pityriasis versicolor for 17% of the infections. This high prevalence of cutaneous fungal infections among diabetics merits systematic screening for the same among this target group.

Keywords: Candidiasis, Tinea versicolor, Dermatophytic infections, Cutaneous fungal infections, Diabetes mellitus

INTRODUCTION

Diabetes mellitus is a chronic non-communicable disease causing an increase in blood glucose levels due to an ineffectiveness or insufficiency of secreted insulin.¹ It is a potential epidemic in India with more than 62 million diabetic individuals and around 177 million people worldwide with the number likely to double by 2030.²

Diabetics have been shown to have a multifold higher risk of bloodstream infection than non-diabetics.³ Infections have also been shown to be the most common skin changes in diabetics.⁴ Several mechanisms have been illustrated to contribute to the increased

susceptibility and severity of infections in diabetic patients.⁵

The aim of our study was to assess the susceptibility of diabetics to various superficial fungal infections. We studied candidiasis, tinea versicolor and dermatophytic infections in diabetics.

METHODS

The study was carried out in Meenakshi Medical College and research Institute in a duration of 6 months.

400 diabetic individuals with 220 men and 180 women who gave consent were chosen at random from the

patients attending the OPD. They were subjected to thorough clinical evaluation. Routine hematological investigations were done. FBS, PPBS, and HBA1C were done to assess diabetic control. Fungal infections were confirmed by KOH mounts. The prevalence of the various cutaneous fungal infections was calculated and the results presented below.

RESULTS

Of the 400 subjects 220 were male and 180 were female. 210 subjects which was 53% of the study population had fungal infections including 106 the men and 104 of the

women. 116 subjects which included 60 men and 56 women had candidiasis. 58 subjects which included 26 men and 32 women had dermatophytic infections. 36 subjects which included 20 men and 16 women had tinea versicolor infections. There was no marked variation in distribution of the mycosis according to sex.

Tinea versicolor amounted to 17% of all cutaneous mycosis with 56% of it in men and 44% in women. The predominant dermatophytic infections were tinea cruris at 44%, followed by tinea corporis at 35%. Tinea glutealis accounted for only 14% and tinea pedis for 7% of the dermatophytes.

Table 1: Overview of the fungal infections in the study population.

	Male	Female	Total	Proportion of total fungal infections
Subjects	220	180	400	-
Total Fungal Skin infections	106	104	210	100%
Tinea Versicolor Infections only	20	16	36	17%
Dermatophytic Infections only	26	32	58	28%
Candidiasis only	60	56	116	55%

The predominant candidal infection was oral candidiasis at 31%, followed by erosio interdigitalis and vulvovaginitis at 22% each. Balanopostitis was seen in 16% of subjects and intertrigo in 9%.

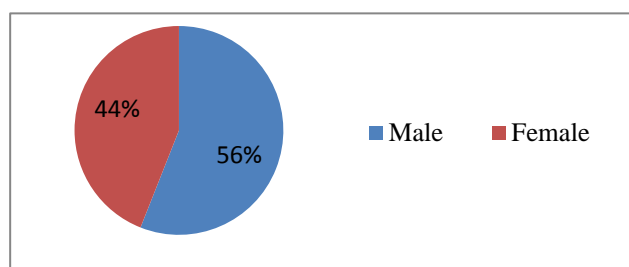


Figure 1: Subjects with and without fungal skin infections.

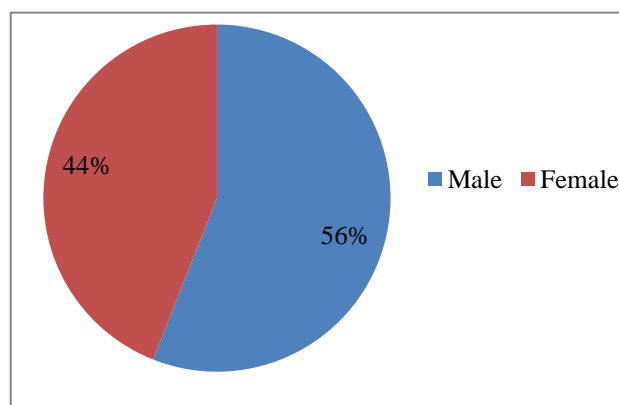


Figure 2: Tinea versicolor infections in men vs. women.

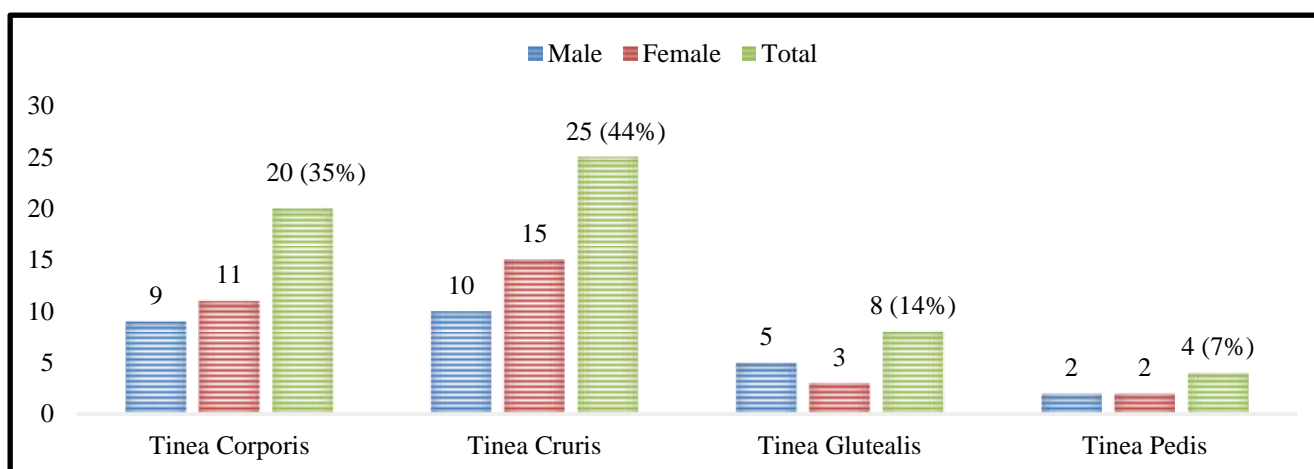


Figure 3: Dermatophyte infections in the study subjects.

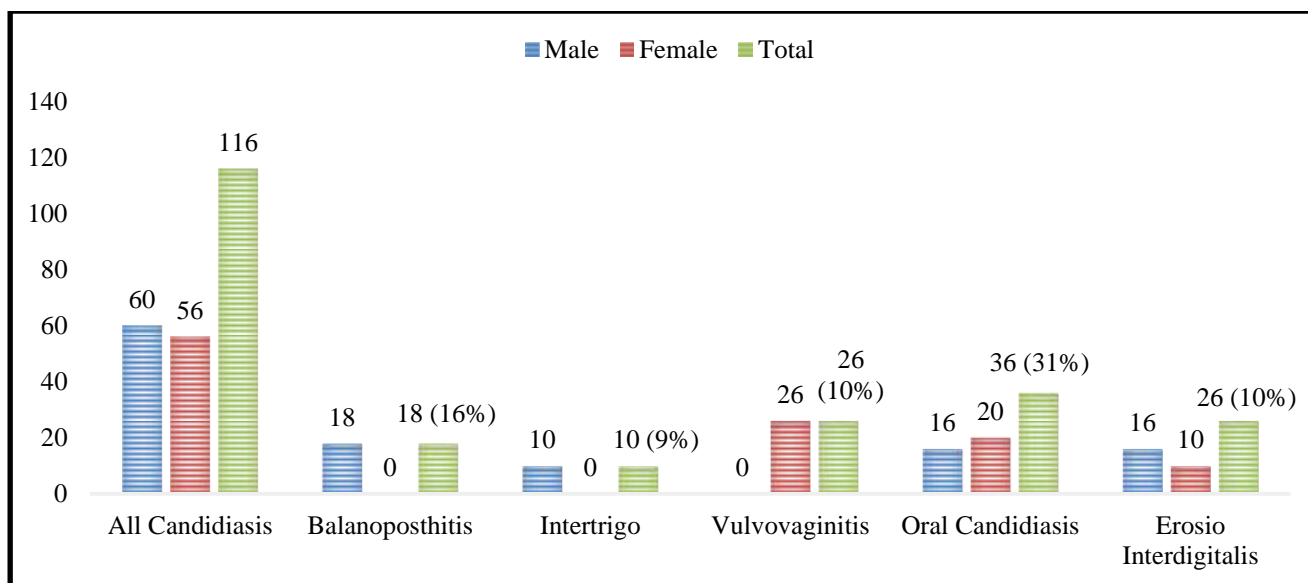


Figure 4: Candidal infections in the study subjects.

DISCUSSION

Of the subjects assessed 53% had cutaneous fungal infections while 47% had did not show signs of cutaneous fungal infections. This was in accordance with previous studies on the topic which showed prevalence rates ranging from 10% to 60%.⁶⁻⁸ There was no significant difference in the presentation of various cutaneous fungal infections across the sexes.

The most prevalent cutaneous fungal infections were candidiasis with 55% of the infection positive subjects presenting with the same. This is justified by studies showing increased candidal infection among diabetics compared with normal subjections.^{9,10} The most prevalent candidiasis was oral candidiasis which consisted of 31% of all cases of candidiasis. This was followed by erosio interdigitalis, blastomycetica and vulvovaginitis at 22% each. Balanopositis was at 16% and intertrigo was at 9% of the candidial cases.

This was followed by dermatophytic infections at 28%. This is significantly higher than seen in healthy individuals as seen in some studies which show rates as low at 2-3%.¹¹ The most prevalent dermatophytic infection was tinea cruris with it being 44% of all dermatophytic infections. This was followed closely by tinea corporis consisting of 37% of the dermatophytic infections. Tinea glutealis and tinea pedis consisted of 14% and 7% respectively. Studies showing prevalence among diabetics weren't forthcoming. However studies of subjects with dermatophytic infections have indeed shown significant association of chronic dermatophytic with diabetes mellitus.¹² Tinea versicolor consisted of 17% of the subjects with cutaneous fungal infection. No studies assessing the same were available.

CONCLUSION

The study has analysed the epidemiology of cutaneous fungal infections in diabetics. A little over half the diabetics studied proved to have cutaneous fungal infections. Candidiasis was the most frequent form of cutaneous fungal infections accounting for 57% of the fungal infections. Dermatophytic infections were seen in 28% of infections and pityriasis versicolor for 17% of the infections. This high prevalence of cutaneous fungal infections among diabetics merits systematic screening for the same among this target group.

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Conflict of interest: None declared

Ethical approval: The study was approved by the institutional ethics committee

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