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ORIGINAL ARTICLE

Epidemiology of Dermatophytoses in Tertiary Health Care Centre in Bundelkhand Region

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ABSTRACT
The prevalence of superficial fungal infections is increasing at an alarming rate. About 25 to 30% of the world population are affected by dermatophytoses .In India, outline is slightly high which ranges from 35 to 75%. The fungal disease comprises of nail, hair and skin infection and the three genera responsible for this superficial dermatophytoses are Trichophyton, Epidermophyton and Microsporum. They invade uppermost layer of the skin and degrade keratin for nourishment. The aim of this study was to access the occurrence and prevalence of dermatophytoses with their clinical and mycological feature in the tertiary health care centre. A total of 150 patients were included in this study based on primary symptoms and sign diagnosed by dermatologist of the health care centre. All obtained samples were examined by conventional direct KOH preparation and fungal culture methods. Grown cultures were observed for colony morphology, colour and texture . Study reveal that number of males is more than females with a ratio of 1.88:1. Tinea corporis was predominant clinical outcome with 71 cases. Frequently affected age group was 21- 40 years in this study. Epidermophyton is the commonest dermatophyte.Overall, the findings suggest that males are proner than females for multiple reasons and dermatophytic fungal species are dynamic to their involvement in causing infection to human.
Keywords: *Superficial fungal infections , Epidermophyton, Dermatologist, Tertiary health care centre.*

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INTRODUCTION

Dermatophytosis is a common skin infection worldwide and is a major health issue around the world especially in tropical and sub tropical region where high humidity and hot climate persists. In past few years, it becomes a major health issue among Dermatologist worldwide. Prevalence of dermatophytes varies with topography and climatic conditions.

Fungi are eukaryotic saprophytes that are ubiquitous in nature. Dermatophytes are group of fungi that invade and infect uppermost layer of the skin, nails and hair. They obtain their nutrition by breaking down keratin present in these sites with the help of enzyme , Keratinase. It is a contagious disease that spreads from person to person with direct contact, contact with soil and from exposure to pet animals. The fungal infections are well known as tinea and are specify by the site of the body affected. The dermatophytic infection is characterized by intense itching, rough and scaly skins with various degrees of redness and swelling; blisters may also appear in severe infections. Members of the three genera of dermatophytes are involved in these skin, hair or nails infections ; Epidermophyton, Microsporum and Trichophyton [1-3].

Though there are various articles and data available from many parts of India but no data or records are available on the occurrence and frequency of dermatophytes in our tertiary health care centre. The

present study was carried out to find the frequency,distribution and risk factors of dermatophytic infections.

MATERIAL AND METHODS

This study was carried out in tertiary health care centre between the period of February 2022 till May 2022.

A total of 150 samples of skin, nails and hair are taken from the patients attending the Department of Dermatology, Venereology and Leprosy of the tertiary health care centre. The patients are confirmed by the doctors on the basis of preliminary do diagnosis and patients detail history of past illness . To gather more information ,family history, eating habit ,their daily life routine were asked by a set of questionnaire. Patients of both genders ; male and female and all age groups are included in this study.

Samples were collected from Dermatology,Venereology, and Leprosy department of MLB Medical College and processing and culture was done in the department of Microbiology lab in Bundelkhand University Campus, Jhansi. The sample collection site was cleaned with 70% alcohol. Skin samples were taken by scrapping the exterior of the lesions with sterile blunt blade, hair by plucking with sterile tweezers and nails by clipping. Samples were collected on black chart paper and transported to the University Lab

Direct microscopy of the obtained samples was done with 10% KOH for hair and skin and 40% KOH for nail samples. Samples were also inoculated on Saboraud's dextrose agar (SDA) with CC (cyclohexamide and chloramphenicol) supplement(HI- media) to inhibit the growth of bacteria and non- dermatophytes. The plates were incubated at 32°C for 2 to 3 weeks .If growth does not occur within 4 weeks, inoculated plates were considered as negative culture .Grown culture of dermatophytes were identified by observing and examining microscopic and macroscopic characteristics of their colony, colour and texture of the grown culture, followed by staining with Lactophenol cotton blue.

STATISTICAL ANALYSIS

Data was collected and analysed using SPSS version 20 software according to the objectives. Percentage and frequency were used for investigation of the findings.

RESULTS

In this study, out of the total of 150 samples, 98 were males (65.33%) and 52 were females (34.66%)and M:F ratio was 1.88:1.

Tinea corporis was most common clinical presentation with 71 cases followed by tinea cruris ,50 out of 150.Tinea pedis, tinea unguim, tinea manuum and tinea capitis constitute 29 of the total patients.Tinea cruris are more frequent in men than women (80%).

Table – 1: Frequency and distribution of clinical manifestation in relation to sex (number 150)

Clinical Manifestation	Male	Female	Total	%
Tinea corporis	38	33	71	47.33%
Tinea cruris	40	10	50	33.33%
Others	20	9	29	19.33%
Total	98	52	150	100%

Dermatophytic infection was more frequent in the age group of 21-40 years (90/150). 60% cases belongs to this age group confirms the susceptibility of this particular age group towards dermatophytic infection.

Table – 2: Association between different age groups and clinical manifestation

Age group	T.corporis	T.cruris	T.unguium	T.pedis	T.faciei	T.capitis	T.mannum	Total
0-10	2	0	4	0	0	2	0	8
10-20	6	8	1	0	3	2	1	21
20-30	27	18	0	0	1	0	1	**47**
30-40	22	12	3	4	1	0	1	**43**
40-50	7	6	1	4	0	0	0	18
50-60	4	4	0	0	0	0	0	8
60-Above	3	2	0	0	0	0	0	5
Total	71	50	9	8	5	4	3	150

In total 150 patients,113(75.33%) patients were from rural areas while 37(24.67%) patients were from urban areas

Table 3: Number of Patients in Relation to Rural/Urban Area

Area	Number of patients	Percentage
Rural	113	75.33
Urban	37	**24.67**
Bundelkhand region(rural+urban)	150	100

122 among 150 clinically suspected cases were KOH positive while 13 KOH negative samples were grown on culture.Total 135/150(90%) samples were culture positive.

Table 4: Association between KOH mount with culture

Test Procedure	Number	Percentage
KOH Positive	122	81.33
KOH Negative	28	18.66
KOH Negative Culture Positive	13	8.66
KOH Positive Culture Negative	0	0
Culture Positive	135	90
Culture Negative	15	10

Epidermophyton floccosum was the commonest species isolated in 50 cases followed by *Trichophyton rubrum(20),Tricophyton verrucossum (18),Tricophyton mentagrophytes(17),Tricophyton tonsurans (15)* and *Microsporum audouinii.*(7). Eight plates were grown as mixed culture that were not further processed.

Table -5: Isolated Dermatophytic Species

Dermatophytic species	Case	Percentage
Epidermophyton floccosum	50	33.33
Trichophyton rubrum	20	13.33
Trichophyton verrucosum	18	12
Trichophyton mentagrophytes	17	11.33
Trichophyton tonsurans	15	10
Microsporum audouinii	7	4.66
Mix Culture	8	5.33
No growth	15	10

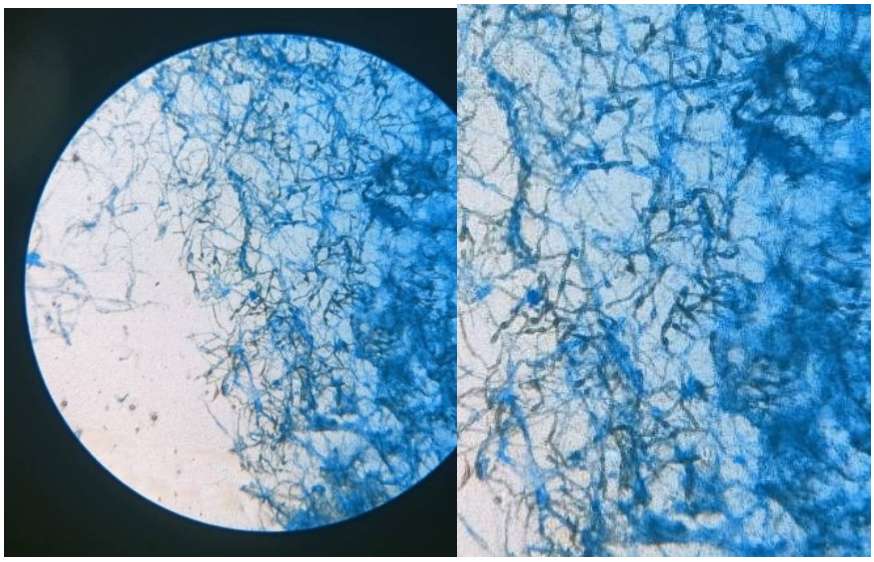

Fig 2 (a) Fig 2 (b)

Fig 2 (a) *Trichophyton rubrum* (b)enlarged view

DISCUSSION

In our study it was observed that infection with dermatophytes was more frequent in males compared to females. Among 150 patients confirmed with clinical manifestation, 98 were males (65.33%) and 52 were females (34.66%) and the male female ratio is 1.88:1. Males are more in percentage than female which shows similar results with earlier studies.[1-5] The reason for increased percentage of males may be due to the fact of increased outdoor exposure ,occlusive clothing and more physical work that results in increased sweating and less cosmetic awareness compared to females.[4]

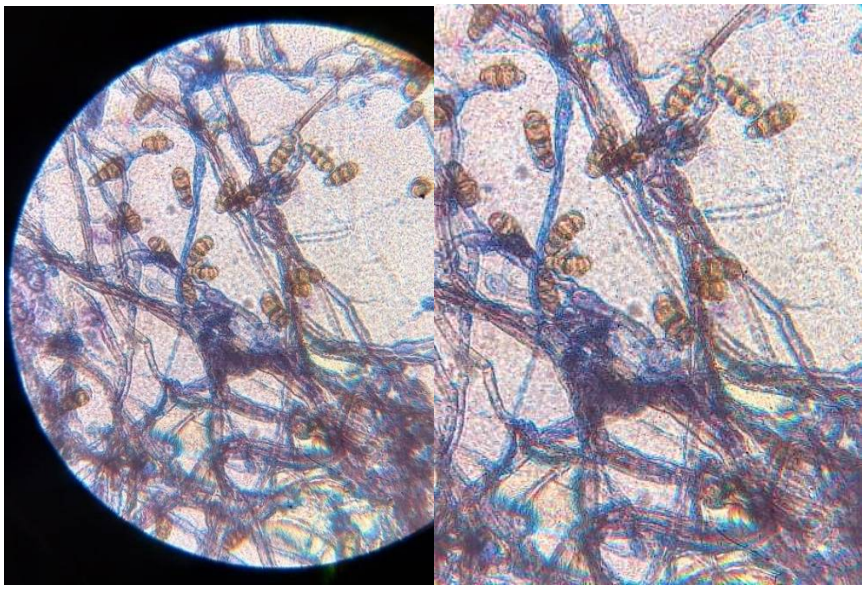

Fig 3 (a) Fig 3 (b)

Fig 3 (a) *Epidermophyton floccosum* (b) enlarged view

Among all the clinical appearances, Tinea corporis was the most common one with 71 (47.33%) out of 150. Earlier studies have also confirmed with the same results.[1,4,5,6] Tinea cruris was the second most common clinical presentation with the 50 out of 150 samples (33.33%), which is similar to other studies.[7-10] Other clinical manifestations (Tinea unguium, Tinea pedis, Tinea manuum and Tinea capitis) constitute 29 patients (19.33%).In all clinical presentation ,males are more in number than females .Social stigma, illiteracy ,poverty, carelessness to health related issues in females may be the reason behind their low frequency

In the present study, we find that dermatophytic infection was more frequent in the age group of 21-40 years (90/150), which shows the susceptibility of this age group. The reason for this may be the increased level of physical activity and sweating in them. This finding correlates with the earlier studies[1,4] .Exposure to external environment, higher interaction with similar age groups, sharing of clothes, active participation in various types of sports, itinerant behavior are some major grounds which make them prone to dermatophytic infection.

In our present study, 113 out of 150 patients (75.33%) came from rural areas. The high percentage of infection in villagers may be due to unawareness, and their unhygienic approach to their health related issues.[12]. The present study also supports this fact .Illiteracy, lower socio-economic status ,day-to-day life style, overcrowding, close contact to pet animals are some predisposing factors to the villagers.

The results of different research articles vary over a broad range on wet KOH mount and culture positivity rate (16, 17).In our study 122/150 (81.33%) samples were KOH positive ,while 135 in total 150 cases were (90%) culture positive .Fungal elements are sometimes difficult to observe by direct microscopy, especially if the tissue is very inflamed .So a negative result does not rule out fungal infection. Direct microscopy, along with culture ,needs to be included in the fungal infections identified clinically, especially where molecular diagnostics are not available (18).

The most common isolated fungal species in present study is *Epidermophyton floccosum* followed by *Trichophyton* species *(rubrum,verrucosum* and *mentagrophytes*) which is in sharp contrast to most other reports by which it appears that *Trichophyton rubrum* is the most common species.[7-10]The species predominant in Bundelkhand region is entirely different from the other part of our country. The great extent of hot (490C) and humid climate may be the reason behind emerging of this utterly different species.

Generally, *Microsporum* and *Epidermophyton* are accounted for very low percentage compared to *Trichophyto*n species.[11-14] Many years of studies of mycological biota indicate that one of its characteristics are constant changes in time related to the presence of particular species of fungi in the natural environment and their involvement in causing infection of the skin and its appendages in human.[15]

CONCLUSION

This work has been an attempt to discover the prevalence of dermatophytes in Bundelkhand region. The present study of 150 patients shows that the occurrence of dermatophytes was more common in this region. Tinea corporis was the commonest clinical manifestation. All the three genera of the dermatophytes ; *Epidermophyton, Trichophyton* and *Microsporum* contributed in the clinical manifestation with *Epidermophyton floccosum* as an emerging dermatophyte There is an urgent need to perform concrete research work in order to confirm it. The prevalence of superficial dermatophytosis, which is on an alarming rise in the past few years, especially in the tropics, poses a management challenge to dermatologists. In spite of this, adequate research in this field and modified treatment guidelines are conspicuously lacking.[11] To the best of our knowledge, this is the first approach to access the frequency and clinical manifestation of dermatophytes in this region. For further study, it gives the platform of future research.

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Conflicts of interest

Nil.

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