ORIGINAL RESEARCH

Microbiological study of Dermatophytosis in a Tertiary care Hospital in South-west Bihar

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ABSTRACT

Aim: Present study aimed to study the Microbiological profile of dermatophytic infections and to identify the causative fungal species in various clinical presentations.

Materials and Method: 752 clinically suspected cases of dermatophytosis were randomly selected for the study. Details of skin lesions were noted. Depending on the presenting condition skin scales, crusts, nail clippings, pluckable hair were collected. After direct microscopic examination, irrespective of demonstration of fungal elements, the specimen was inoculated into a test tube containing Sabouraud's dextrose agar with 0.05% chloramphenicol and 0.5% cycloheximide. This was incubated at 28° C for up to 4 weeks. If no growth was found after 4 weeks, it was taken as negative for growth of fungi. Fungal isolates were identified based on colony morphology, pigmentation, growth rate, microscopy in Lactophenol Cotton Blue mount(LCB). The statistical analysis was done on Microsoft Word and Excel.

Results: Tinea cruris(51%) was the most common type with cases followed by tinea corporis(40%) cases and tinea faciei(4%) cases and tinea mannum(3%) cases. Out of 752 clinically suspected cases of dermatophytosis, fungi were demonstrated in 465 (61.83%) cases by direct microscopy and 120 (13.5%) were culture positive. There is a significant association between KOH and culture as all 120 culture positive samples had fungi demonstrated in direct microscopy. Among these 102 cases, the most common isolate was T. mentagrophytes with 32 cases (31.37%), followed by T. tonsurans with 28 cases (27.45%) and T.verrucosum with 26 cases (21.66%). Single specie of each namely T.voilecium and Microsporum was isolated. Malasezia cases were 4 (3.33%). Mixed infection with Tricophyton species was observed in single case. Diabetes mellitus was the most common systemic disorder with dermatophytosis with 20(19.60%) cases followed by HIV infection with 5(4.9%) cases.

Conclusion: The present study also reveals the changing trends in the prevalence of various dermatophyte species in this part of Bihar. There is raised incidences of dermatophytosis in Females which can be corelated with their increased participation in outdoor activities, work and raised medical concern for diagnosis and treatment. Finally, the clinicians should always consider the risk of multisite involvement by fungi causing dermatophytosis in patients associated with systemic diseases. General awareness of personal hygiene avoiding delay in seeking treatment should be propagated by medical professionals.

Keywords: dermatophytic infections, fungal infections, Microbiological study.

INTRODUCTION

The dermatophytes constitute a group of superficial fungal infections of keratinized tissues, namely the epidermis, hair and nails.[1] The causative fungi are moulds belonging to three asexual genera Microsporum, Tricophyton and Epidermophyton. The distribution and frequency of dermatophytosis and their etiological agents vary according to the geographic region studied, socioeconomic level of the population, the time of study, the climatic variations, the presence of domestic animals and age.[2,3] The present study was undertaken to assess the profile of dermatophytic infections and to identify the causative fungal species in various clinical presentations.

AIM: To study the Microbiological profile of dermatophytic infections and to identify the causative fungal species in various clinical presentations.

STUDY DESIGN: Hospital based microbiological study.

PLACE OF STUDY: Department of Microbiology, Madhubani Medical College, Madhubani, Bihar

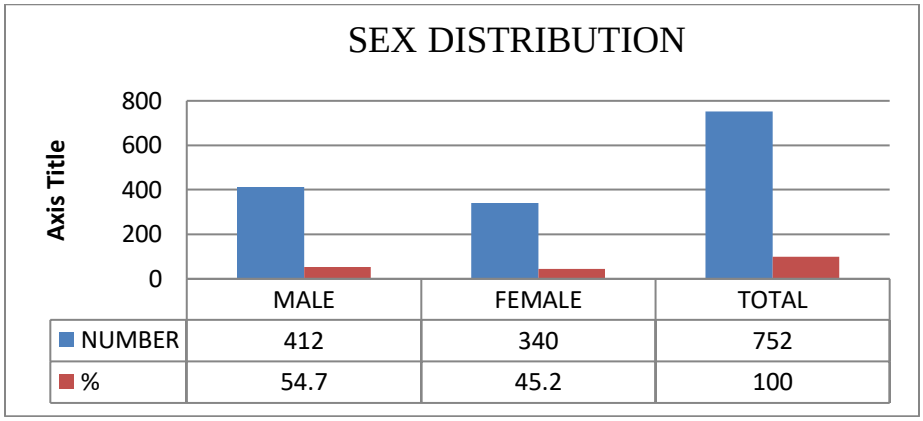
DURATION OF STUDY: 1 year (12 months)

MATERIALS AND METHODS

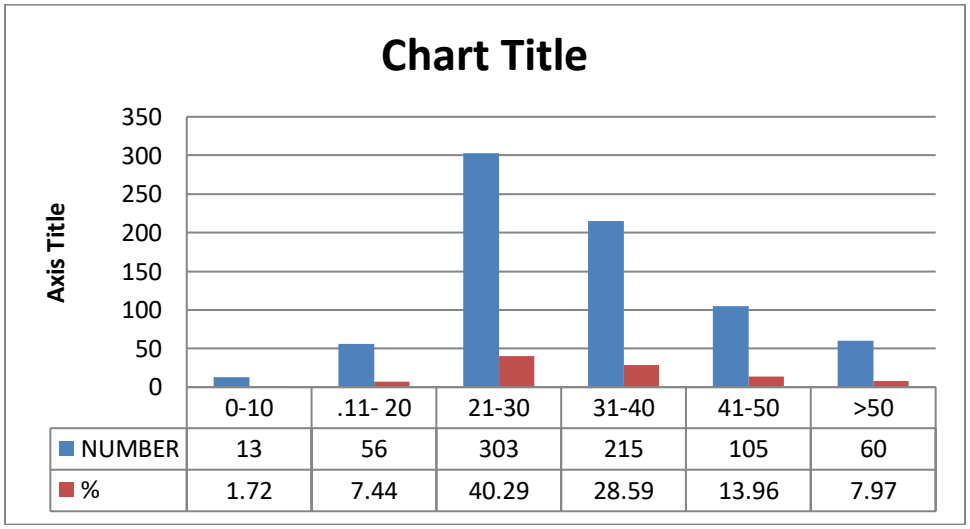
752 clinically suspected cases of dermatophytosis attending the outpatient department of a tertiary care hospital during a one year period from August 2021 to July 2022 were randomly selected for the study. Details of skin lesions were noted. All new cases of dermatophytosis of all age groups and both sexes were included in the study. Depending on the presenting condition skin scales, crusts, nail clippings, pluckable hair were collected. Specimen collected was subjected to potassium-hydroxide (KOH) wet preparation (10% KOH for skin and 40% KOH for nail) for the presence of fungal elements. After direct microscopic examination, irrespective of demonstration of fungal elements, the specimen was inoculated into a test tube containing Sabouraud's dextrose agar with 0.05% chloramphenicol and 0.5% cycloheximide. This was incubated at 28° C for up to 4 weeks. If no growth was found after 4 weeks, it was taken as negative for growth of fungi. Fungal isolates were identified based on colony morphology, pigmentation, growth rate, microscopy in Lactophenol Cotton Blue mount(LCB). The statistical analysis was done on Microsoft Word and Excel.

RESULTS

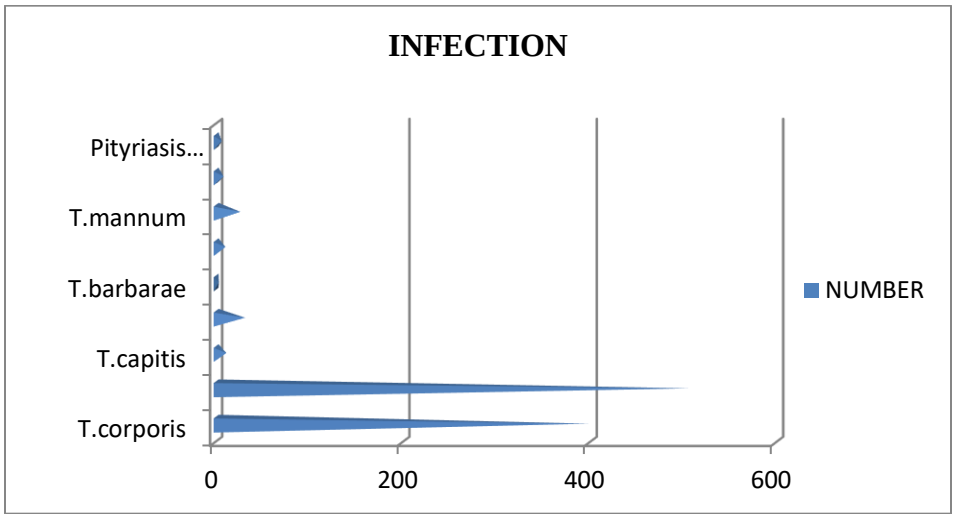
Out of 752 cases, 412(54.7%) were males and 340(45.2%) were females.



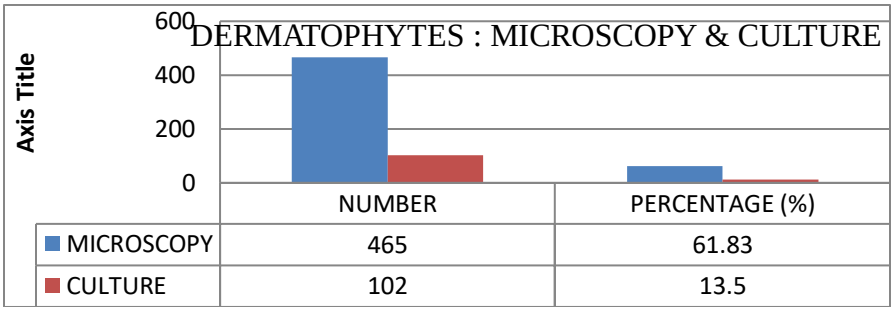
Majority of patients belonged to the age group 21-30 years (40.29%), followed by 31-40 years (28.59%) , 41-50 years (13.96%) while age group 0-10 (1.72%) were found to be least affected followed by >50 years (7.97%) and 11-20 years (7.44%).



Tinea cruris(51%) was the most common type with cases followed by tinea corporis(40%) cases and tinea faciei(4%) cases and tinea mannum(3%) cases.

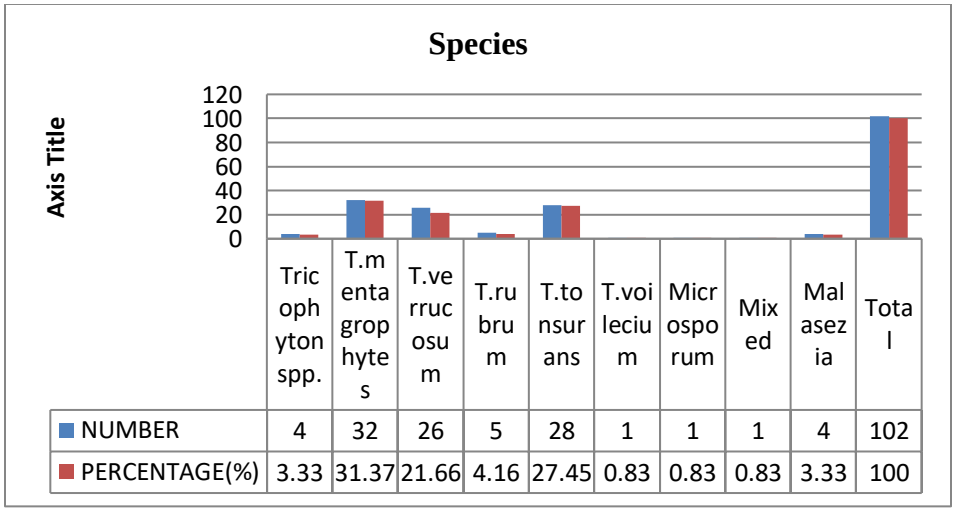


Out of 752 clinically suspected cases of dermatophytosis, fungi were demonstrated in 465 (61.83%) cases by direct microscopy and 120 (13.5%) were culture positive. There is a significant association between KOH and culture as all 120 culture positive samples had fungi demonstrated in direct microscopy.



	NUMBER	PERCENTAGE (%)
MICROSCOPY	465	61.83
CULTURE	102	13.5

Among these 102 cases, the most common isolate was T.mentagrophytes with 32 cases (31.37%), followed by T. tonsurans with 28 cases (27.45%) and T.verrucosum with 26 cases (21.66%). Single specie of each namely T. voilecium and Microsporum was isolated. Malasezia cases were 4 (3.33%). Mixed infection with Tricophyton species was observed in single case.



	Trichophyton spp.	T.mentagrophytes	T.verrucosum	T.rubrum	T.tonsurans	T.voilecium	Microsporum	Mixed	Malasezia	Total
NUMBER	4	32	26	5	28	1	1	1	4	102
PERCENTAGE(%)	3.33	31.37	21.66	4.16	27.45	0.83	0.83	0.83	3.33	100

In the present study, diabetes mellitus was the most common systemic disorder with dermatophytosis with 20(19.60%) cases followed by HIV infection with 5(4.9%) cases.

Figure 1: Tinea carports

Figure 2: Tinea barbareae

Figure 3: Tinea carports

Figure 4: Tinea capitis

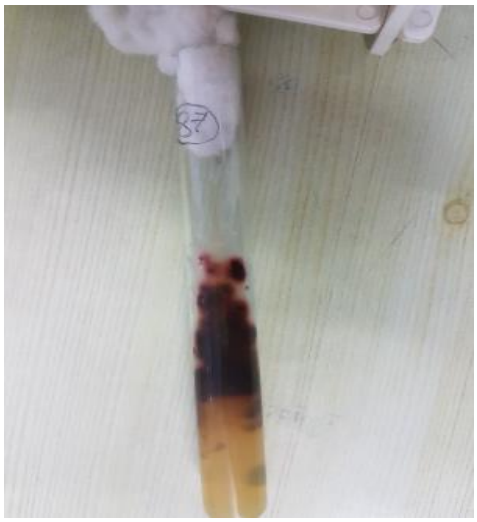


Figure 5: Trichophyton rubrum on sabrouds dextrose agar with chloramphenicol

Figure 6: Trichophyton mentagrophytes on sabrouds dextrose agar with chloramphenicol

Figure 7: Trichophyton verrucosum on sabrouds dextrose agar with chloramphenicol

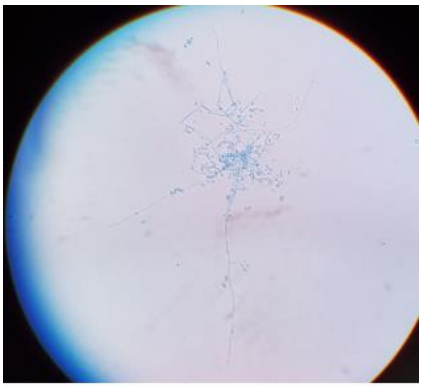


Figure 8: LPCB mount of Trichophyton rubrum

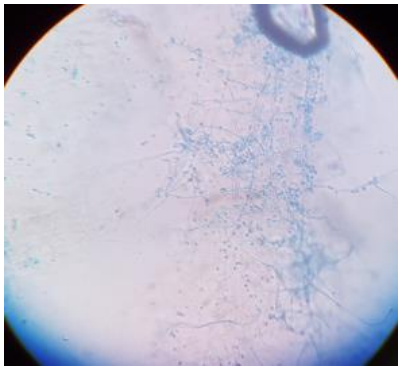


Figure 9: LPCB mount of Trichophyton mentagrophytes

DISCUSSION

In the present study dermatophytosis was most common in the age group of 21-30 years(40.29%). Studies conducted by Verenkar et al[4] and Sumana et al[5] also showed higher prevalence in the same age group. The increased incidence of dermatophytosis in this age group may be due to the fact that this population group takes part in maximum outdoor activities which predisposes them to acquire infection from environmental exposure.[5,6] In the present study, incidence of dermatophytosis in males(54.7%) were slightly higher than females (45.2%). This is slightly different from studies of Amin et al, Singh et al and Belurkar et al.[7,8,9] Predisposing factors for males may be due to the occupational hazards and females may be due to the nonreporting to hospitals owing to prevailing social stigma. Tinea cruris was most common clinical type in the present study, seen in 51% of patients which is similar to the study of Amin et al[7] and many other studies.[10,11,12] Prevalence of tinea corporis infection is

second highest 40% in this study. Overcrowding and sharing of fomites like towels and bed sheets etc. may be responsible for such higher incidences. The prevalence of Tenia facei 4% and tenia mannum 3% this higher prevalence is due to hot and humid climatic condition of the place of study and long term exposure to moisture without preference given to drying. Lower incidence has been noted in studies by Karmakar et al[13] and Singh et al. These variations are dependent on study population where majority of patients in the present study belonged to lower socioeconomic groups. In the present study, 25% of patients showed multiple site involvement. This is comparable with the study of Siddappa et al.[14] Among those with multiple site involvement observed in our study may be due to associated systemic diseases such diabetes mellitus and HIV/AIDS along with poor hygiene and delay in seeking treatment.

CONCLUSION

In our study, fungi were demonstrated by direct microscopy in cases 465(61.83%) out of cases7 52. Hence direct microscopy with or without culture is an important diagnostic tool in diagnosis of dermatophytosis. The overall positivity by culture was 13.5 %. T.mentagrophytes(31.37%) was the most common isolate obtained followed by T.tonsurans(27.45%). Most Indian studies had reported T.rubrum as the predominant isolate from dermatophytosis. Thus, the present study also reveals the changing trends in the prevalence of various dermatophyte species in this part of Bihar. There is raised incidences of dermatophytosis in Females which can be corelated with their increased participation in outdoor activities, work and raised medical concern for diagnosis and treatment. Finally, the clinicians should always consider the risk of multisite involvement by fungi causing dermatophytosis in patients associated with systemic diseases. General awareness of personal hygiene avoiding delay in seeking treatment should be propagated by medical professionals.

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