ORIGINAL RESEARCH PAPER

Medical Microbiology

CLINICOMYCOLOGICAL PROFILE OF DERMATOPHYTOSIS IN A TERTIARY CARE TEACHING HOSPITAL, KOTA, RAJASTHAN

KEY WORDS:
Dermatophytoses, Tinea Corporis, Trichophyton Mentagrophyte

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ABSTRACT

Introduction: About 20–25% of the world's populations are infected with dermatophyte and the incidence is increasing steadily In India, the cause of dermatophytoses is adversely influenced by economic factors such as poverty, poor hygiene and social conditions like overcrowding. Hadoti region is characterized by its semi – arid climate, which can influence the prevalence of dermatophytes infection.The main objective of this study was to determine the prevalence, etiological agents, and distribution patterns of the disease among the patients attending a tertiory care teaching hospital, kota for effective prevention and treatment strategies. **Materials and Methods:** This is a retrospective study conducted in the Department of Microbiology govt. medical college and associated hospital kota from Octomber 2023 to March 2025. The microbiological records of potassium hydroxide (KOH) mount examination and the fungal culture report of skin, hair, and nail samples during the study period were analyzed. **Results:** A total 402 skin, hair, and nail samples were received for fungal culture as investigations requested by dermatologist. Out of total 402 samples, KOH mount was positive in 51.24% and the culture was positive in 36.8% cases. Dermatophyte was isolated in 31.84% cases. Trichophyton mentagraphyte (53.37%) was the predominant dermatophyte isolated followed by T. tonsurans (20.95.) and T. rubrum (6.09%). **Conclusion:** The present study gives an insight about the prevalence and distribution pattern of dermatophytoses in kota, India. Tinea corporis was the most commonly diagnosed clinical condition followed by Tinea cruris. T. mentagrophytes was implicated as the predominating species.

INTRODUCTION

Dermatophytes are a distinct group of fungi that infect the keratinized tissues like skin, hair, and nails of humans and animals and can produce a variety of cutaneous infections. This group of fungi are closely related antigenically, physiologically, and morphologically and are commonly known as ringworm fungi.[1] Dermatophytes are classified into three anamorphic (asexual orimperfect) genera, Epidermophyton, Microsporum, and Trichophyton. [2] On the basis of their primary habitat, dermatophytes can also be divided into anthropophilic, zoophilic, and geophilic. Species of all the three groups can cause human infection. [3]

About 20–25% of the world's population is infected with dermatophyte and the incidence is increasing steadily.[4] Fungal infection of the skin and its appendages is more prevalent in India due to favorable climatic conditions like temperature and humidity. India is a tropical and developing country, and the cause of dermatophytoses is adversely influenced by economic factors such as poverty, poor hygiene and social conditions like overcrowding[5]

MATERIALS AND METHODS

This study is a retrospective study conducted in the Department of Microbiology Govt.medical college kota and attached hospitals from October 2023 to march 2025.The microbiological records of potassium hydroxide (KOH) mount examination and fungal culture report during the study period were analyzed. Culture positive cases were correlated with clinical diagnosis. A total of 402 samples (skin scrapings,nail clippings, and hair) were received for fungal culture in Mycology laboratory during the study period. All the specimens received in the Mycology laboratory were subjected to KOH mount before culture. Specimens were subjected to culture on Sabouraud's dextrose agar media containing antibiotics (chloramphenicole and cycloheximide) and incubated at 25°C and 37°C for a period of 4 weeks. Species identification was done on the basis of colony morphology, finding of teased mount by using lactophenol cotton blue stain,[by hyphae, microconidia and characterstic macroconidia]. Urease test was used to differentiate between Trichophyton rubrum and T.mentagrophytes. Further, for definitive identification of these isolates, corn meal agar with 1% dextrose was used. T. rubrum produces red pigment in this medium.

Statistical Analysis

The interpretation and analysis of the data were done by using Microsoft Excel. The quantitative data were expressed as numbers and percentages in a tabular form.

RESULTS

A total of 402 samples were received for fungal culture, out of which 352 (87.56%) were skin scrapings, 42 (10.45%) were nail clippings, and 8 (1.99%) were hair samples, respectively. A total of 272 (67.66%) samples were received from male patients and 130 (32.34%) from females. KOH mount was positive for fungal elements in 206 (51.24%) cases and culture was positive for fungal isolate in 148 (36.8%) cases. On the KOH mount, hyaline septate hyphae were reported in 198(49.25%) cases and yeast cells in 4 (.995%). In culture positive cases, dermatophytes were reported in 128 (31.84%) cases, Candida species in 14 (3.48%), and other fungus was reported in 6 (1.49%) cases. The age and sex distribution along with mycological findings in these cases are shown in Table 1. Dermatophytes were isolated from 120 skin scrapings, 5 nail clippings, and 3 hair samples. Trichophyton species was isolated in 126 (31.34%) cases and Microsporum and Epidermophyton species in 1 (0.25%) cases each. T. mentagraphyte (53.37%) was the most common fungal isolate.

Table 1: Distribution of Fungal Culture Positive Cases in Relation to Age and Sex

Age group	Male	Female	KOH Positive		Culture positive	
			Male	Female	Male	Female
0-10yrs	9	5	2	2	1	2
11-20 yrs	64	24	52	5	30	10
21-30 yrs	80	33	52	11	26	11

31-40 yrs	42	22	23	6	10	6
41-50 yrs	37	21	19	7	9	7
51-60 yrs	20	14	11	5	9	6
61-70 yrs	12	7	7	2	5	2
>70 yrs	8	4	3	0	3	0
Total	272	130	168	38	104	44

DISCUSSION

Superficial fungal infections are a worldwide problem, constituting a large number of cases. Dermatophyte infections are more prevalent in the developing world. Warm and humid environment of the tropical and subtropical regions are considered to be best suited for the dermatophyte infections and have been reported from various parts of India. As there is scarcity of studies documenting the profile of dermatophyte infections in the southeastern part of Rajasthan, this study highlights the mycological and clinical profile of dermatophytoses. In addition to the hot climatic condition in hadoti region , other factors like coaching centres, migration of laborers, and close contacts might contribute to the development of dermatophytoses in this region. Out of total 402 samples, KOH mount was positive in 51.24% and culture was positive in 36.81% cases. Dermatophyte was isolated in 31.84% cases. Similar type of culture positive finding was also observed by other studies.[6,7,] Contrary to the present study, some other studies observed much high percentage (62–70%) of fungal culture positivity.[8,9] The overall male and female ratio in both groups is approximately 2.09:1. Of the culture positive cases, 70.27% were males. High prevalence in males have been also reported by other studies from India.[10,11] This may be due to the differences in occupational exposure of both the sexes as males are more involved in outside activities. Most of the patients belonged to the age group of 21–30 years in this study, almost similar observations have been reported by another study as well.[12] The main reason for higher prevalence in this group may be because the individuals in this group are often most active and involved in outdoor activities such as studies and jobs. In this study, various dermatological conditions were diagnosed by the dermatologist based on the clinical presentation. Tinea corporis (76.35%) was the most common clinical condition diagnosed followed by Tinea cruris (16.89%) among culture positive cases in this study. Similar observations were also reported by some other studies;[10,13] however clinical conditions varies in different geographical areas. In the present study, T. mentagrophytes was the predominant dermatophyte (53.37%) isolated followed by T. Tonsurans (20.95%) and T. rubrum (6.09%). Microsporum species and Epidermophyton species were isolated. in .675% cases each.

T. mentagrophytes as a predominant dermatophyte isolated also described by some other studies as well.[10,14] This interesting finding is contrary to the observation of other recent study.[15] T. rubrum was reported as a predominant dermatophyte by this study. The plausible explanation for this reverse trend may be in the fact that T. rubrum is generally linked to chronic dermatophytoses.[16] However, the exact data about the chronic cases of dermatophytoses included in the study were not available. Clinically, only 20% cases did not respond to local antifungal treatment and required oral therapy Candida species and nondermatophytic molds were isolated in 9.46% and 4.05%, respectively, in this study. Among nondermatophytic molds, fungi isolated were Aspergillus, Alternaria, Curvularia, Acremonium, and Fusarium species, but without repeated isolation from the lesion they carry no significance. In a study, Lakshmanan et al. reported 24.4% nondermatophytic fungi, mostly comprising Candida, Aspergillus, Alternaria, Curvularia, and Fusarium, suggesting that nondermatophytic molds are emerging agents of superficial mycoses.[17] It is important for family physicians to emphasize that clinical diagnosis of dermatophytoses can be unreliable because these infections have many mimics, which can manifest identical lesions. For example, Tinea corporis may be confused with eczema, Tinea capitis may be confused with alopecia areata, and onychomycosis may be confused with dystrophic toe-nails due to repeated minor trauma. Physicians should confirm suspected dermatophytoses with KOH mount preparation or culture. KOH mount can be used as a point of care test before prescribing medications. Tinea corporis, Tinea cruris, and Tinea pedis generally respond to topical antifungal agents, but oral antifungal agents should be considered for severe disease, failed topical treatment, immunocompromised patients, or severe moccasin-type Tinea pedis. Due to tolerability, high cure rate, and low cost oral terbinafine should be used as a first-line therapy for Tinea capitis and onychomycosis. However, kerion should be treated with griseofulvin unless Trichophyton has been established as the pathogen.[18] The limitations of this study are its retrospective nature, in which antifungal susceptibility was not performed. Genomic and proteomic studies were not performed, which could have given better clarification about fungal species.

Clinico-mycological profile of dermatophyte infections

Table 2: Fungal isolate and their correlation with type of skin infections

Fungal isolate	Clinical diagnosis among culture positive cases							Total (%)
	Tinea corporis	Tinea cruris	Tinea capitis	Tinea incognito	Tinea pedis	Onychomycosis	Intertrigo	
T. mentagrophytes	67	10	1	1				79(53.37)
T. Tonsurans	23	5		1	1	1		31(20.95)
T. rubrum	5	4						9(6.09)
T.violaceum	3	1	1					5(3.38)
T.schoenleinii	1							1(.675)
Microsporum audouinii	1							1(.675)
Microsporum gypseum	1							1(.675)
Epidermophyton floccosum	1							1(.675)
Candida sp.	7	3				2	2	14(9.46)
Other fungus	4	2						6(4.05)
Total	113	25	2	2	1	3	2	148

CONCLUSION

In conclusion, present study gives an insight about the prevalence and distribution pattern of dermatophytoses in southeastern part of Rajasthan, India. Tinea corporis was the most commonly diagnosed clinical condition followed by Tinea cruris. T. mentagrophytes was implicated as the predominating species followed by T. tonsurans and T. rubrum. This data could help in the diagnosis of the disease and thus the spread of the disease can be controlled with specific control measures.

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Conflicts of Interest: There are no conflicts of interest.

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