Section: Dermatology

Original Research Article

A CLINICO MYCOLOGICAL STUDY OF DERMATOPHYTIC INFECTIONS: AN OBSERVATIONAL STUDY

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ABSTRACT

Background: Aim and Objectives: The aim and objectives of the study were to assess the epidemiological profile, clinical types, and association between the etiological agent isolated and the clinical type of dermatophytic infections, clinical diagnosis and KOH and culture sensitivity. **Materials and Methods:** An observational prospective study was carried out at conducted in the Department of DVL, ACSR Govt. Medical College, Nellore, AP, India. 184 Participants were selected based on Inclusion and exclusion criteria. Data collection was done with help of personal interview and detailed examination by investigator using predesigned, pre-tested, and structured questionnaire. All patients were followed up in dermatology department till complete investigation, treatment, and discharge. **Results:** Tinea corporis 67 (36.4%) was the commonest clinical type followed by tinea cruris 65 (35.3%), tinea unguium 13 (7.06%), tinea pedis 13 (7.06%), tinea manum11 (5.97%) tinea capitis 8 (4.34%), tinea barbae 4 (2.17%) and tinea faciei 3 (1.63%). Commonest age group affected was 21-30 years (33.69%). Male to female ratio was 1.78:1.Majority of cases belonged to middle socio-economic status 93 (50.54%). Infection was more common in manual workers 59 (32.06%) followed by students 40 (21.73%), agricultural wokers 28 (15.21%), house-hold workers 23 (12.5%), children/toddlers 2 (1.08%) and others 32(17.3%). Fungi were demonstrated in 91.33% cases, either by direct microscopy and/or culture. KOH was positive in 72.2%% of cases where asCulture positivity was seen in 61.41%. Of the dermatophytes isolated, *T. rubrum* 63 (55.75%) was the commonest organism followed by *T. mentagrophyte* 41 (36.28%), *E. floccosum* 4 (3.53%), *T.verrucosum* 3 (2.65%) and *M.canis* 2 (1.76%). **Conclusions:** The prevalence of dermatophytosis was most pronounced in rural regions, among individuals of lower socioeconomic status, and during the summer season, highlighting the impact of evolving environmental and socio-economic factors on the epidemiology of dermatophytic infections.

INTRODUCTION

Dermatophytoses are infections that affect keratinized structures, including the epidermis, hair, and nails. These infections are caused by a group of closely related filamentous fungi known as dermatophytes.[1] Superficial fungal infections are widely reported as one of the most common infectious diseases in dermatology clinical practice worldwide. Despite therapeutic advances in recent decades, the occurrence of cutaneous mycoses continues to increase.[2] Dermatophytes, depending on their living origin, are classified as anthropophilic (human), zoophilic (animal), or geophilic (soil). Anthropophilic dermatophytes are the most common sources of tinea infections.[3]

The typical clinical presentation of a tinea infection includes an annular lesion with a central clearing surrounded by a red, scaly elevated border. Inflammation plays a role in the colonization process and can lead to the formation of vesicles on the border of the affected area. Individuals with atopic conditions and those with zoophilic fungal

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infections often experience more pronounced inflammation.[3]

India is a large subcontinent with remarkably varied topography, situated within the tropical and subtropical belts of the world. Its climate is conducive to the acquisition and maintenance of fungal infections.[4] These infections are assuming greater significance both in developed and developing countries, particularly due to the advent of immunosuppressive drugs (steroids) and the increased prevalence of diseases like HIV.[5] In India, cases of superficial fungal infections were first reported from upper Assam by Dr. Powell in 1900 AD. Since then, various studies have been conducted from different regions of the country.[6]

The clinical presentation of ringworm infection is often mistaken for other skin diseases, highlighting the need for laboratory diagnosis and confirmation.[7] It is important to accurately assess the prevalence and identify the causative agent in order to estimate the scope of the problem and implement effective measures to prevent transmission and spread of the infection.[8] Therefore, this study aims to compare the accuracy of clinical diagnosis with KOH smear sensitivity and culture sensitivity.

MATERIALS AND METHODS

A prospective observational study was conducted at the dermatology Venereology and Leprology department of ACSR Medical College and GGH, Nellore, Andhra Pradesh, India. 184 study subjects meeting the inclusion and exclusion criteria were included after obtaining approval from the institutional ethical committee. The study took place over a six-month period, from July 2025 to December 2025. The selected cases were analyzed using a specific form to gather relevant information. Comprehensive details including name, age, sex, address, occupation, duration of illness, and the involvement of multiple sites were collected for each case. After gathering a comprehensive medical history, a comprehensive clinical examination was performed in favorable lighting, emphasizing the specific location of the lesion, the quantity and characteristics of the lesions, the existence of inflammatory margins, and the extent of the condition.

Specimen Collection

The affected area was cleaned with 70% ethyl alcohol, skin scales, crusts and pieces of nail or hairs were collected in clean white paper packets. Skin specimen was collected by scraping across the inflamed margin of lesion into the apparently healthy tissue. Nail specimen was collected by taking clippings of the infected part and scrapings beneath the nail. Hair specimen was collected by plucking with epilating forceps along with the base of the hair shaft around the follicle.

Direct Microscopic Examination

Specimen collected was subjected to KOH wet preparation of various concentrations (10%, 20% and 40%) depending on the type of clinical specimen for the presence of fungal elements. The fungal elements appear as highly refractile, hyaline septate branching filaments.

Culture

For primary isolation SDA with 0.5% Chloramphenicol and 0.05% Cycloheximide slopes were used and Dermatophyte test media was used as a selective media. Slide culture was done to study the micro morphology of microconidia and macroconidia, nature of the sporulation, special structures such as spirals, pectinate, racquet hyphae, and chlamydospores. Special tests were performed when necessary, viz, hair perforation test and biochemical test like urease test was done for species identification.

RESULTS

One hundred and eighty four patients of dermatophytosis who presented to the outpatient department of DVL, ACSR Medical college and government general hospital from 1st July 2025 to 31st December 2025 were studied. The detailed results are discussed below and are analysed using Chi-square test and Percentage charts and Graphs

Table 1: Occupational status of the study group

Occupation	No. of cases	Percentage
Manual workers	59	32.06%
Students	40	21.73%
Agricultural workers	28	15.21%
House wives	23	12.50%
Children	2	1.08%
Others	32	17.39%
Total	**184**	**100%**

Out of 184 cases, 59cases (32%) were manual workers followed by students 40 (21.73%), agricultural workers 28 (15.21%), house wives 23 (12.50%), children 2(1.08%).Rest of the people constitute 32 (17.39%).

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Table 2: Socioeconomic Status of the study group

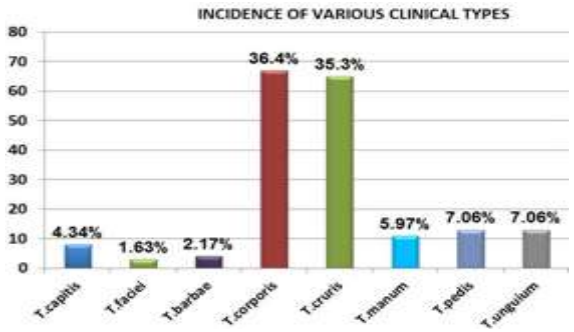
SES	No. of cases	Percentage
High income	13	7.06%
Middle income	93	50.54%
Low income	78	42.39%
Total	**184**	**100%**

A total of 184 diagnosed patients of dermatophytosis were studied. Majority of the cases were from middle income group with 93 cases (50.54%) followed by low income group with 78 cases (42.39%) and high income group with 13 cases (7.06%).

Table 3: Incidence of Various Clinical Types

Clinical Type	No. of Cases	Percentage
T.capitis	8	4.34%
T.faciei	3	1.63%
T.barbae	4	2.17%
T.corporis	67	36.4%
T.cruris	65	35.3%
T.manum	11	5.97%
T.pedis	13	7.06%
T.unguium	13	7.06%
TOTAL	**184**	**100%**

Most common clinical type isolated is tinea corporis 67 (36.4%) cases followed by 65(35.3%)cases of tinea cruris, 13 (7.06%) cases in tinea pedis, 13 (7.06%)cases in unguium 11 (5.97%) cases in tinea manum,8 (4.34%) cases in tineacapitis,4 (2.17%) cases tinea barbae, 3 (1.63%)cases in tinea faciei.



Graph 1: Incidence of Various Clinical Types

Figure 1: Gray patch or Non-inflammatory type of tinea capitis

Figure2: Kerion or Inflammatory type of tinea capitis

Figure 3: Tinea faciei

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Figure 4: Tinea corporis

Figure5: Tinea Corporis

Figure 6: Tinea unguium

Figure 7: Tinea pedis

Figure 8: Tinea manum

DISCUSSION

Dermatophytosis is the commonest group of superficial fungal infections seen in tropics where hot and humid climate is conductive for growth of these fungi.[1,9]They are believed to affect 20% to 25% of world's population and incidence continues to increase.

They are predominantly caused by dermatophytes, and the causative species vary with geographic region. Some species are distributed worldwide, such as T.rubrum, T.mentagrophytes var interdigitale, Microsporum canis, and Epidermophyton floccosum. Others have partial geographic restriction, such as T. schoenleinii (Eurasia, Africa), T. soudanense (Africa), T. violaceum (Africa, Asia, and Europe), and T. concentricum (Pacific Islands, Far East, and India). The present study included 184 clinically diagnosed cases of dermatophytosis attending DVL outpatient department of Narayana medical college hospital, Nellore

Age and sex distribution

Dermatophytosis can affect any age group with no specific age group being immune to infection. Although all age groups can be affected the majority of patients in present study were in the 21-30 years age group accounting for 33.69% followed by 11-20 years (19.02%), which is similar to other studies done by Sen SS et al,[10] Sahai S et al,[11] and

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Peerapur BV et al,[1] whereas Veer P et al,[12] Madhuri JT et al,[13] Lakshmi vasantha poluri et al,[14] and Tonita M Narohnaet al.[15] Jain N et al,[16] reported that the most common age group was 31-40 years.

In the present study, males (64%) were more commonly affected than females (36%).Male to female ratio was 1.78:1, which is corresponding with previous studies by Karmakar S et al.[17] Male predominance could be due to increased outdoor physical activities and increased opportunity for exposure to infection than females.

Socio-economic status

In the present study, dermatophyte infection was most common in middle income group 50.54% followed by low income group 42.39% and high income group 7.06%. Similar findings were seen with Sarma S et al,[18] Bindu V et al,[19] and Agarwal US et al.[20] This was in contrast to the observations of Ranganathan S et al,[28] who reported that 69.2% of infected people were from low income group and 23.2% from middle income group.

Occupational status

In the present study, dermatophytosis was most commonly seen in manual workers 59(32.06%), followed by students 40 (21.73%), agricultural workers 28 (15.21%) , then house hold workers 23 (12.5%) which includes house wives, maids and service women 2 cases (1.08%) of toddlers and others 26(17.3%). The above findings are comparable with the observations of Sumana V et al, Veer P et al reported that agricultural workers were most commonly affected.[21-22] Maduri JT et al,[23] in her study concluded that housewives are most commonly affected.

Clinical Types

Tinea corporis was the most common clinical diagnosis made, 67(36.4%) of the 184 clinical types (37%) studied were diagnosed with tinea corporis. 65 (35.3%) of the cases were tinea cruris making it the second highest clinical type found in our study. Less aeration due to tight clothing, maceration and high rate of sweating in groin and waist region make this site more vulnerable to dermatophytosis recurrence and chronicity were observed to be more frequent in tinea corporis and tinea cruris, the severe itching associated with these two conditions, making them seek medical advice.

These clinical types were followed by T.unguium 13 (7.06%) and T.pedis 13 (7.06%). Incidences of these clinical types are increasing now days due to increase in use of occlusive foot wear. The next common clinical types are T.manum, T.capitis, T.barbae and T.faciei with incidence of 11(5.97%), 8 (4.34%), 4 (2.17%) and 3 (1.63%) respectivey. This study is comparableb to study done by siddappa et al, Mishra M et al and other studies.[24-25] Hanafy M M Ahmed et al reported Tinea capitis as most common clinical presentation followed by T.pedis.[26] Peerapur B V et al reported T.corporis with T.cruris as most common clinical presentation followed by T. Cruris alone.[1]

KOH findings

Direct microscopy by KOH examination is a commonly used modality to visualize and characterize the superficial mycoses. Although the yield of diagnosis is high, it could still be negative in a significant percent of patients and also falsely negative in 5% - 15 % of the patients. The KOH positivity also appears to be affected by the site of infestation. In our study 72.2% of the total patients examined were positive by microscopy. This finding is similar to study done by Peerapur B V et al,[1] where fungal elements were identified in 74% of cases by KOH preparation

Culture findings

Microbiological confirmation of the species responsible for dermatophytosis is crucial in diagnosing superficial fungal infections. This confirmation also plays a key role in directing the treatment towards the particular fungus causing the infection. Culturing fungi in Sabouraud's agar is a common method, but adding antibiotics to the culture media is important as it prevents bacterial growth and promotes fungal growth. The microbiological confirmation obtained in 61.41 % of the patients in present study. This finding is comparable to Peerapur BV eta al (64%),[1] Lakshmi vasantha poluri et al (56.36%).[14]

Out of 184 clinically suspected cases of dermatophytosis, fungi were demonstrated in 168 cases (91.3%) either by direct microscopy and/or culture. eighty (43.47%) were positive by both microscopy and culture. Fifty five (29.84%) were positive by microscopy and negative by culture. Twenty eight (15.2%) were negative by microscopy but culture positive. Sixteen cases (8.69%) were negative both by microscopy and culture. These findings are comparable with other studies done by Sumana V et al,[21] Karmakar S et al,[17] Singh S et al,[3] and Bindu Vet al.[19]

In the present study, T. rubrum 63 (55.75%) was the commonest aetiological agent in majority of clinical types followed by T. mentagrophytes 41(36.28%), which is comparable to other studies done by Bindu V et al,[19] Ranganathan S et al,[28] Singh S et al,[3] and Jain N et al.[29] E. flocossum was the third aetiological agent of dermatophytosis isolated in 4(3.53 %)cases followed by T.verrucosumand M.canis in 3 (2.65%) and 2(1.76%) cases respectively which is comparable to previous studies by Bindu V,[19] Sahai S et al,[11] and Kannan P et al.[30]

CONCLUSION

Dermatophyte infections are prevalent in our nation due to the combination of a hot and humid climate, subpar hygienic conditions, and various factors such as immuno-suppression, occupational trauma, and corticosteroid use. There exists a significant disparity in the isolation of various species between the southern and northern regions of India, with

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Trichophyton species being the most prevalent causative agent of dermatophytosis.

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