

**CLINICO-MYCOLOGICAL PROFILE OF DERMATOPHYTIC INFECTIONS****G.KUMARAN AND M.JEYA***

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ABSTRACT

The common cause of skin infections are dermatophytes and opportunistic fungi. The prevalence of dermatophyte infection varies with different geographic area and climatic conditions. This study was undertaken to study the clinical pattern and the etiological agents of dermatophyte infections. Clinical samples from 100 patients were subjected to microscopic examination and culture on various media. In total 100 specimens collected, 54 were skin scrapings, 39 were hair samples and 7 were nail clippings. Direct microscopy revealed fungal elements in 65% of the cases, of these 50(77%) were culture positive and 15(23%) was culture negative. No fungal elements were observed in KOH mount in 35% of the cases, of these 5 (14%) yielded growth of fungi and 30(86%) were culture negative. Among the 55 fungal isolates, 49 were dermatophytes. The predominant isolate from all samples were *Trichophyton mentagrophytes* (33%). The study signifies the importance of mycological examination in the diagnosis of various mycoses for their effective management.

KEY WORDS: Dermatophytes, Dermatophytosis, *T.mentagrophytes*, *T.rubrum***M.JEYA**

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INTRODUCTION

A skin infection due to dermatophytes has become a significant health problem affecting children, adolescents and adults¹. The cutaneous fungal infections of man includes a wide variety of diseases in which the integuments and its appendages the hair and the nail are involved². Dermatophytic infection is generally restricted to the non lining cornified layer but a variety of changes occurs in the host because of the presence of the infectious agent and its metabolic products³. Majority of the infections are caused by a homogenous group of keratophilic fungus called the dermatophytes⁴. A single species might be involved in several clinical types each with its distinct pathology⁵. Recently there has been an increase in the incidence of fungal infection. This increase may be a result of frequent usage of antibiotics, immunosuppressive drugs⁶. The type and severity of these reactions are related to the immune status of the host as well as to the strain and species of the organism causing the infection⁷. The prognosis among these immunocompromised patients is very poor and therefore institution of early diagnosis and treatment is essential^{8, 9}. Now effective drugs are available for chemotherapy of fungal infections and further modalities are being developed for management of the same.

MATERIALS AND METHODS

The study population included 100 consecutive patients with clinically suspected dermatophytosis, who attended the outpatient department of Dermatology of Chettinad hospital & Research Institute, Chennai, from June 2012 to Dec 2012. A detailed clinical history including age, sex, duration, site and extent of infection, type of lesion, antifungal therapy taken, diabetic or immunocompromised, occupation of patient and contact with pet animals was taken. Skin scales, nail and hair fragments were collected from patients with suspected dermatophytosis according to the site of infection^{1, 2}. Patients were examined and grouped in different clinical types depending

upon the site of involvement. Clinical specimens like skin scrapings, infected hair and clipped nails were collected after cleaning the area with 70% alcohol in sterile small paper envelopes². Skin scrapings were collected gently from margin of the lesions². Basal portion of the infected hair was collected with sterile forceps². Nail clippings were taken from discoloured dystrophic or brittle parts of the nails². All specimens were subjected to direct microscopy for fungal elements in 10% and 20% KOH mount and cultured in Sabouraud's dextrose agar with gentamicin and actidione and dermatophyte test medium². Dermatophytes can grow easily on Sabouraud dextrose agar with gentamicin and actidione which is used to avoid contamination with saprophytic fungi^{1,3-10}. Fungi can be identified by colony morphology, texture, top and reverse side pigmentation and conidial structures. Microconidia and macroconidia were identified by Lacto cotton blue mount of the culture². The slide culture was also carried out to study undisturbed morphology of conidia, conidiophores and hyphae². Fungal slide culture was performed when there is difficulty in identification of fungal species. Urease test and Hair perforation tests were performed to differentiate trichophyton species². Non dermatophytic fungi were identified by lacto phenol cotton blue mount and slide culture^{2,8}. Budding yeast cells of *Candida* species were identified by microscopic morphology and the production of chlamydospores on corn meal agar and germ tube formation.

RESULTS

In the present study samples from 100 cases of clinically suspected dermatophytosis were subjected to mycological examination. Out of which 40% were females and 60% were males, maximum cases reported were above 21 years (31.8%) and the least were from below 10 years (2.7%). In total 100 specimens collected, 54% were skin scrapings, 39% were

hair samples and 7 % were nail clippings. The split up of patient category was 40% fresh cases, 7% old cases with irregular treatment, 42% patients with relapses, 8% had contact history with infected patients in their houses and work spot and 3% had contact with animals. Among 100 specimens cultured 49 dermatophytes and 6 non dermatophytic fungus were isolated which includes *Candida albicans* 2, *Aspergillus niger* 2, and each one of *Mucor* and *Curvalaria species*. There was no growth

in 45 specimens. *Tinea corporis* was the commonest lesion accounting for 23% of the cases in this study followed by *Tinea capitis* 21%, *Tinea cruris* 18%, *Tinea barbae* 18%, *Tinea manum* 9%, *Tinea unguinum* 7%, and *Tinea pedis* 4%^{Table 1}.

The KOH mount was positive for fungal elements in only 65% of samples collected and out of that culture positivity was 55%. Among these culture positive isolates 49% were dermatophytes

Specimen	Clinical types of lesions	Number of cases	Trichophyton rubrum [11]	Trichophyton mentagrophyte [33]	Microsporum canis [3]	Microsporum gypseum [2]	Other fungus [6]	No growth [45]
Skin [54]	<i>Tinea corporis</i>	23 (42.6%)	5 (21.8%)	11 (47.8%)	-	1 (4.3%)	2 (8.6%)	4 (17.5%)
	<i>Tinea cruris</i>	18 (33.4%)	3 (16.7%)	4 (22.3%)	2 (11%)	-	-	9 (50%)
	<i>Tinea manum</i>	9 (16.6%)	-	5 (55.6%)	-	-	1 (11%)	3 (33.4%)
	<i>Tinea pedis</i>	4 (7.4%)	-	-	-	-	-	4 (100%)
Hair [39]	<i>Tinea capitis</i>	21 (54%)	2 (9.5%)	6 (28.6%)	1 (4.7%)	-	1 (4.7%)	11 (52.5%)
	<i>Tinea barbae</i>	18 (46%)	-	7 (38.8%)	-	1 (5.6%)	-	10 (55.6%)
Nail [7]	<i>Tinea unguinum</i>	7 (100%)	1 (14.3%)	-	-	-	2 (28%)	4 (57.7%)

Details	KOH Pos	KOH Neg	Culture Pos	Culture Neg
Total samples processed [100]	65%	35%	55%	45%
Culture positivity in KOH positive samples [65]	-	-	50 (77%)	15 (23%)
Culture positivity in KOH negative samples [35]	-	-	5 (14%)	30 (86%)
Total Dermatophyte isolated [49]	44 (89.7%)	5 (10.3%)	-	-

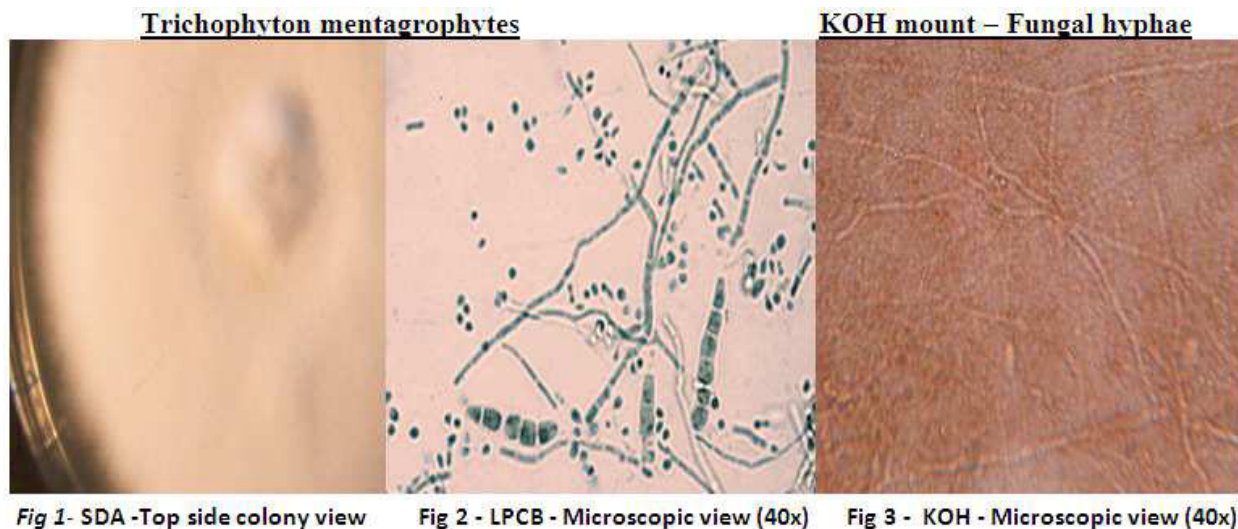


Fig 1- SDA -Top side colony view

Fig 2 - LPCB - Microscopic view (40x)

Fig 3 - KOH - Microscopic view (40x)

and 6% were non dermatophytes. Among 49 dermatophytes, 31 isolates were obtained from skin scales, 17 from scalp and hair and 1 from nail clips. In the total of 49 Dermatophytes, 44 isolates belonged to the *Trichophyton* species of which 33 isolates were *Trichophyton mentagrophytes* followed by 11 isolates were *Trichophyton rubrum* and 5 isolates belonged to *Microsporum* species of which 2 isolates were *Microsporum gypseum* and 3 isolates were *Microsporum canis* ^{Table 2}.

DISCUSSION

In the present study out of 100 samples processed 60% were from males and 40% were from females. Study showed that males were predominantly affected than females ^{1,3-5,9,10}. Male preponderance may be correlated with the occupational hazards related to their nature of work, the frequent interaction with different people of the society, environmental conditions such as hot and humid weather, poor personal hygiene and illiteracy are other major factors that influence dermatophytosis. In this study dermatophytosis was more common above 20 years (31.5%) of age group. Most of the patients (31.8%) were above 35 years. This is similar to other studies ^{4,8,9}. In total of 54 skin scrapings specimens tested the culture positivity was 36% from patients with Tinea corporis, followed by 17 % Tinea cruris, 12% Tinea manum and 35% cases were no growth

in culture similar to other studies ^{3-5,8,9} where the culture positivity from skin scrapings were more in cases of Tinea corporis. Evidence shows that most of the patients were involved in exhausting physical work with profuse sweating. Furthermore they wear tight synthetic clothes resulting in conditions like increased dampness and warmth of the body facilitating the skin surface suitable for the growth of dermatophytes. The KOH mount was positive for fungal elements in 65% of samples collected and culture positivity was 55%, among these cultures positive isolates 49% were dermatophytes and 6% were non dermatophytes and 30% did not show evidence of the fungi either on direct microscopy and culture. These results are mostly comparable with the study of Doddamani et al (2013). KOH positive and culture negative could be due to non viability of fungal elements in some cases. Out of Forty nine isolates of dermatophytes thirty three isolates (67.3%) were *Trichophyton mentagrophytes* followed by eleven isolates (22.5%) were *Trichophyton rubrum* and five isolates (10.2%) were *Microsporum* species. Most of the studies ^(3-6,9-12) showed that *Trichophyton rubrum* as the predominant isolate but in this study *Trichophyton mentagrophytes* was the most predominant and *Trichophyton rubrum* was the second common isolate from the total specimens.

CONCLUSION

Isolation rate of all the fungi has been observed to be much higher in this study and it can be concluded that the isolation rate can be enhanced with aseptic and proper culture techniques. *Trichophyton species* form the commonest aetiological agent of Dermatophytosis.

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