

EFFICACY OF ANTIFUNGAL TREATMENT IN THE CLINICOMYCOLOGICAL CURE OF T. CORPORIS/T. CRURIS

Sajitha K¹, Carol Z. Fernandes²

¹Associate Professor, Department of Microbiology, Dr. B. R. Ambedkar Medical College, KG Halli

²HOD, Department of Dermatology, Bangalore Baptist Hospital, Hebbal, Bengaluru.

ABSTRACT

BACKGROUND

Dermatophytes are among the common fungal agents causing superficial skin infections worldwide. They affect about 20-25% of the world population and the causative agents of these infections vary from place to place. The present study was aimed at finding out the clinicomycological pattern of dermatophytosis, aetiological agents, comparing the clinical diagnosis with laboratory investigations and the clinicomycological cure following treatment. Terbinafine is well tolerated on topical administration and has low potential for drug interactions. In clinical trials, mycological and overall efficacy rate of topical terbinafine is around 80% and with an intermittent pulse dose therapy, cure rate of around 90% has been reported.

MATERIALS AND METHODS

This was a case series study of 50 patients. Clinical specimens like skin scraping were collected under aseptic precautions and sent to laboratory. All specimens were subjected to direct microscopy for fungal elements in 10% KOH and only KOH positive cases were included in the study. Culture was done in Sabouraud's dextrose agar with chloramphenicol and cycloheximide and incubated at 26°C and 37°C separately. The colony morphology was identified by microscopy and confirmation of morphology was done by slide culture. All patients were treated with 1% topical terbinafine cream, twice daily for 4 weeks. KOH mount was repeated post-treatment and those patients who were not clinically and mycologically cured were treated with oral terbinafine for two weeks and topical terbinafine for another 4 weeks.

RESULTS

Out of 50 patients, maximum were seen in the age group of 18-27 years (32%). All 50 samples were positive by microscopic examination, out of which 48% were positive by culture. *Trichophyton rubrum* (54.16%) was the commonest isolate followed by *T. mentagrophytes* (33.33%), *M. gypseum* (4.16%) and *M. audouinii* (4.16%). 90% of patients had clinical cure (absence of visible erythema and scaling) after treatment with topical terbinafine for 4 weeks. The remaining patients were treated with oral terbinafine for two weeks and topical cream for another 4 weeks. During follow-up after 8 weeks, KOH mount was negative for all patients except one patient who was KOH and culture positive with same fungal isolate.

CONCLUSION

This study highlights a common problem in many areas of the world and suggests that further measures regarding public health and personal hygiene must be undertaken in order to reduce the risk of dermatophytosis. Also, a short duration of topical terbinafine along with systemic terbinafine, if required is very effective in the treatment of *T. corporis*/*T. cruris*. The endpoint of treatment is the clinical and mycological resolution.

KEYWORDS

Superficial Fungal Infection, Dermatophytes, Tinea, *Trichophyton Rubrum*, Terbinafine Hydrochloride.

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BACKGROUND

Dermatophytes are among the common fungal agents causing superficial skin infections worldwide. They are keratophilic, hence colonise keratinised tissue (stratum corneum of epidermis, hair & nail) and induce an inflammatory response.^{1,2} *Trichophyton*, *Microsporum*, *Epidermophyton* are three genera of dermatophytes implicated in superficial mycosis.³ Based on habitat (Source of the keratin used), they are classified as Geophilic (Organism originates from soil),

Anthropophilic (organism originates from humans), Zoophilic (Organism originates from animals).² Dermatophytosis is more prevalent in tropics, and may reach epidemic proportions in areas where high rate of humidity, overpopulation and poor hygienic conditions are prevalent.⁴

Dermatophytosis has been classified, according to the site of infection.⁵

- Tinea capitis - affects the scalp and hair.
- Tinea faciei - affects the face.
- Tinea barbae - affects facial hair in adult males.
- Tinea corporis - affects the glabrous skin.
- Tinea cruris (jock itch) - affects the groins.
- Tinea manuum - affects the palmar area.
- Tinea pedis (athlete's foot) - affects the feet.
- Tinea unguium - affects the finger nails and toe nails.

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Corresponding Author:

Dr. Sajitha K,

No. 5, Manuvana, 1st Main,

D Cross, Vijayanagar, Bangalore-560040.

E-mail: sajithakarunan@gmail.com

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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 mycotic infections. Although common, the precise size of the problem defies measurement.⁴

Aim of the Study

The present study was undertaken to:

1. Investigate the clinical pattern of dermatophytosis of the glabrous skin and groin.
2. Identify the species of fungi.
3. Compare the clinical diagnosis with KOH positivity and culture positivity.
4. Analyse the clinicomycological cure following oral and topical treatment with terbinafine.

MATERIALS AND METHODS

This was a case series study which included 50 patients, over three months diagnosed clinically as having dermatophytosis who were randomly selected from the Dermatology OPD, Dr. B. R. Ambedkar Medical College Hospital, Bangalore. A detailed history was taken from all patients, which included age, sex, occupation, socioeconomic status, duration of disease, history of recurrence, habits and associated diseases. History of similar illness in family members and contact with animals or soil was also obtained. A wash out period of 15 days was advised for all patients applying any medication. Thus, patients with Tinea incognito were not included. Also, patients with serious systemic underlying conditions and other infections like bacterial and fungal infections (like candidiasis and pityriasis) were excluded.

The lesion was assessed using the investigator’s static global assessment score which included scaling, erythema and pruritus and size of the lesion less than 30% of body surface area being involved. Skin scrapings were collected from the active edge of the lesions under aseptic precautions.

Direct microscopy (in 10% KOH), mounted on a glass slide was done under microscope for the presence of fungal elements and culture was done in each case. For isolation, Sabouraud’s dextrose agar with chloramphenicol and cycloheximide prepared in our department were used and incubated at 26°C and at 37°C for a period of 4 weeks. Colony of each isolate was stained with Lactophenol cotton blue (LPCB) and observed under microscope. The identification was based on colony morphology and LPCB mount on features like microconidia, macroconidia and additional structures. Confirmation of isolate was done by slide culture.

RESULTS

Out of the 50 patients, the maximum were seen in the age group 18 to 27 years (32%). Most patients belonged to the 3rd decade of life. The youngest patient was an 18-year-old boy and the oldest a 65-year-old man. Male to female ratio was 1.6:1 (Figure 1). Majority of the patients belonged to the lower income group.

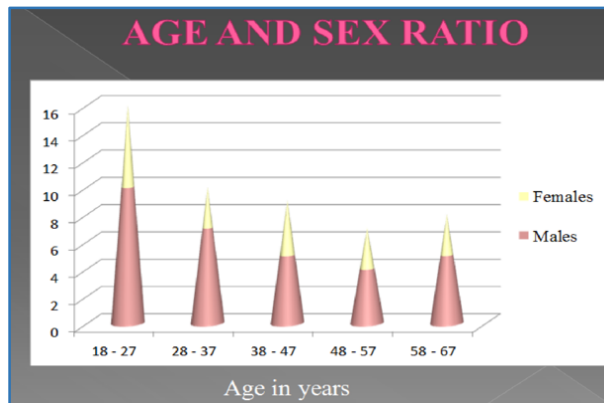


Figure 1. Age and Sex Distribution of Patients

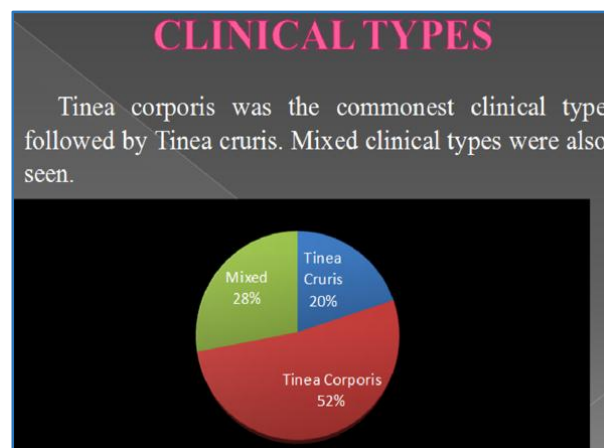


Figure 2. Distribution of Clinical types of Fungal Infections

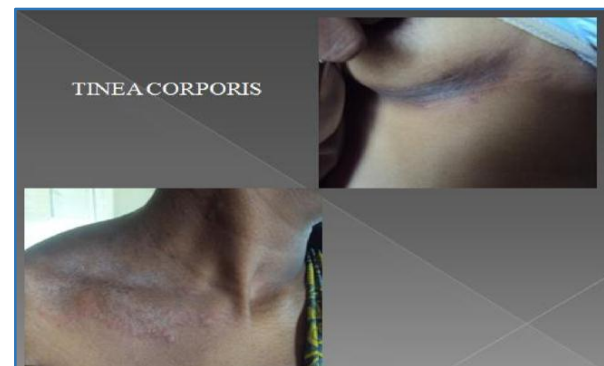


Figure 3. Cases of Tinea corporis



Figure 4. Cases of Tinea cruris

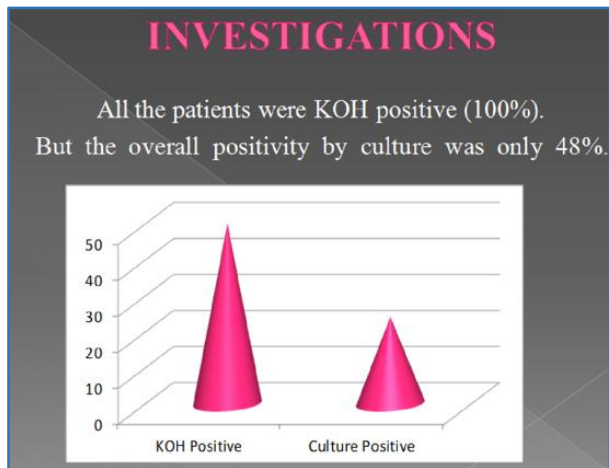


Figure 5. Details of Investigations (KOH Mount and Culture Positivity)

Species Isolated

Trichophyton rubrum was the predominant species isolated (54.16%) followed by T. mentagrophytes (33.33%). Other isolates included Microsporum nanum, Microsporum gypseum and Microsporum audouinii (4.16% each) (Figure-6, 7, 8).

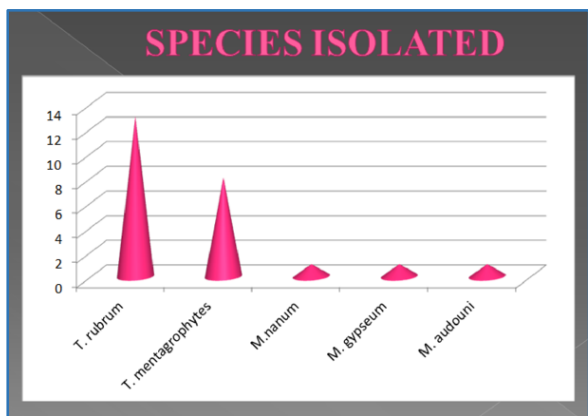


Figure 6. Breakup of Species Isolated

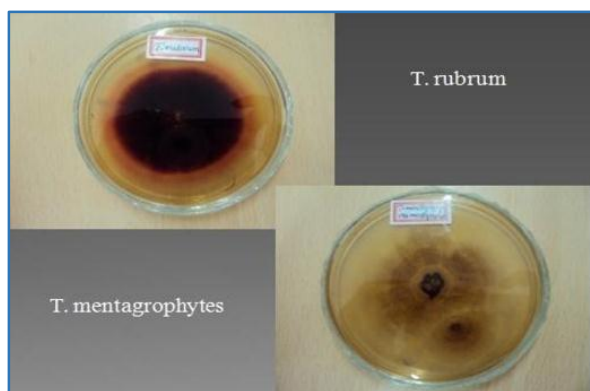


Figure 7. Isolates of Trichophyton spp.

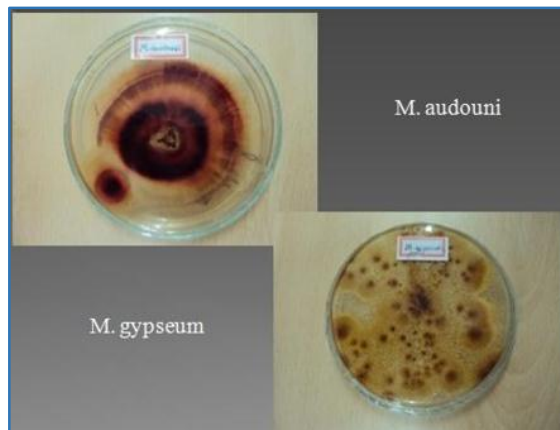


Figure 8. Isolates of Microsporum spp.

Treatment

Since all the patients had body surface involvement of around 30% they were started on topical terbinafine cream, twice daily for 4 weeks. All the patients showed clinical improvement.

Post Treatment

KOH mounts were repeated post-treatment, 90% (45) patients recovered both clinically and mycologically. Out of the remaining 10% (05) patients, 4 patients with mixed infections and one patient with T. corporis were treated with oral Terbinafine 250 mg once daily for two weeks and topical cream for another 4 weeks. There was complete cure in all patients by the end of 8 weeks, except one patient, who was still culture positive post-treatment and the same fungal isolate T. mentagrophytes var. mentagrophytes was isolated.

DISCUSSION

In the present study, maximum number of patients were seen in the third decade with males outnumbering females, as compared to other studies.^{6,7,8} The higher incidence in young males could be due to greater physical activity and increased sweating.^{5,9} The commonest clinical types of dermatophytosis was Tinea corporis followed by Tinea cruris as the symptoms makes the patient to seek medical advice. Similar findings have been reported by other workers, both in India and abroad.^{7,9,10,11}

All our patients were positive on direct microscopy. However, only 48% specimens were positive by culture. T. rubrum, an obligate anthropophilic dermatophyte was the most common isolate (54.16), almost equally isolated from T. corporis (4), T. cruris (5) and mixed infections (4) followed by T. mentagrophytes (33.33%), isolated from T. corporis (3), T. cruris (1) and mixed (4). This is in keeping with other Indian and western studies.^{9,12,13} Trichophyton mentagrophytes also has a major reservoir in rodents. One of our patient from whom T. mentagrophytes var. mentagrophytes, a zoophilic species isolated was a temple priest. This patient showed recurrence of lesions and his culture post treatment also isolated the same species. He had controlled diabetes mellitus. Probably he was exposed to the rodents in the temple, repeatedly. In a study at Madras, all patients were diabetic but our patient had controlled diabetes mellitus.¹⁴ Hay has reported that diabetes is a predisposing factor in the development of dermatophytosis.³ One more interesting zoophilic species isolated was M. nanum from a case of T. corporis similar to a study at Madras, as this patient had been to his village where pigs were

present.¹⁵ The most common geophilic species, *M. gypseum* was isolated from a case of *T. corporis* who came with high inflammatory reaction on his hand.^{4,16} *M. audouinii* was isolated from a case of *T. corporis* in an 18-year-old male patient similar to a study from North India.¹⁷ It is commonly isolated from *T. capitis* in children, but we isolated from an adult male, probably he was in contact with children while playing.^{18,19} This highlights the importance of both direct microscopy and culture in the definitive diagnosis and prevention of recurrence of dermatophytosis.

Treatment

The treatment is based on the site of infection, aetiological agents and the ability of the drug to act at that site. Though topical antifungals are sufficient for the cure of *Tinea corporis/Tinea cruris* for a short duration, some lesions fail to respond to topical therapy and need oral therapy.²⁰ Earlier days Griseofulvin was the drug of choice for tinea infections, but gradually the relapse rate increased and thus Terbinafine was pushed to the forefront for the treatment of *Tinea corporis/Tinea cruris*.²¹ Terbinafine is well tolerated after topical or oral administration and has a relatively low potential for drug interactions. Pharmacoeconomic data support the use of terbinafine in dermatophyte infections of the skin and nails.²² As the body surface involvement was around 30%, patients were started on topical 1% Terbinafine hydrochloride cream twice daily for 4 weeks, 90% of patients recovered, remaining 10% of patients were treated with oral Terbinafine for 2 weeks and topical terbinafine for another 4 weeks. There was complete cure in all patients by 8 weeks except for one patient with *T. corporis*, who was repeatedly in contact with rodents indirectly. In an update of use of terbinafine in superficial mycoses, the use of 1% terbinafine hydrochloride cream in *T. corporis/T. cruris* showed that in more than 80% of patients there was complete cure rate,²² but in our study the cure rate was 90% at the end of 4 weeks and 98% of all patients with complete cure at the end of 8 weeks. All our patients were followed up till the end of 8 weeks with complete cure and the drug showed good tolerability with no adverse effects, also a short duration of oral terbinafine is very effective in extensive cases of *T. corporis/T. cruris*.²² Thus, the efficacy of the drug to *T. corporis* and *T. cruris* was very good both topically and systemically and complete cure can be obtained by 4-8 weeks.

CONCLUSION

This study highlights a common problem in many areas of the world and suggests that further measures regarding public health and personal hygiene must be undertaken in order to reduce the risk of dermatophytosis. Also, a short duration of topical terbinafine along with systemic terbinafine, if required is very effective in the treatment of *T. corporis/T. cruris*. The endpoint of treatment is the clinical and mycological resolution.

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