



Research Article

CROSS SECTIONAL STUDY ON SPECTRUM OF DERMATOPHYTOSIS

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Abstract- Dermatophytes species *Trichophyton*, *Microsporum* and *Epidermophyton* are the most common fungal agents associated in superficial skin infections worldwide. The present study was undertaken with the following aims and objectives as to know the clinico-mycological profile of dermatophytic skin infections in the outpatient population attending the dermatology department of a tertiary care centre and to look for any changing trends.

Keywords- Cross Sectional Study, Dermatophytosis

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Introduction

One among the common infections seen by any dermatologist in their clinics is dermatophytosis and there is a remarkable rise in the trend of dermatophytosis in the recent years from different parts of India [1]. Dermatophytosis and their etiologic agents have a varied distribution and frequency which is based on various aspects of study including geographic region, time of study, socioeconomic level of the population, age, presence of domestic animals and climatic variations [2]. Globally dermatophytic infections are exhibiting chronicity due to inadequate treatment or emergence of resistance to commonly used antifungal agents [3]. Dermatophytes colonize and invade the stratum corneum of the skin, hair and nail by digesting the keratin with help of enzyme proteases. They belong to the genera fungi imperfecti and are classified as *Trichophyton*, *Microsporum* and *Epidermophyton* [4]. The current study was undertaken to look for the clinico-mycological profile and any change in trend of dermatophytosis in a tertiary care centre South India.

Materials and Methods

A cross sectional study was done for a period of one year between 01/04/2018-01/03/2019 after obtaining the ethical clearance from the institutional ethics committee (Ref No: CSP-MED/18/FEB/42/40). Samples were collected from patients attending the outpatient department of Dermatology, Sri Ramachandra Medical Centre, with signs and symptoms suggestive of tinea infection. The affected part of the skin was cleaned with 70% ethyl alcohol, after 1-2 minutes scrapings were collected from the active borders of the lesions in a sterile autoclaved black chart paper with the help of sterile surgical blade No.22. Affected hairs were epilated with sterile forceps and scales from scalp near the affected hair also collected in a sterile autoclaved black chart paper. Similarly affected nails were collected. The samples collected were subjected to 10% KOH and 40% KOH mount (Nails). They were examined under the microscope for the presence of fungal elements. After direct microscopic examination, irrespective of the demonstration of fungal elements the scrapings were inoculated into slopes of duplicate sets of tubes containing Sabouraud's dextrose agar with chloramphenicol and Dermatophyte test medium with actidione. The tubes were incubated at 37°C and 25°C (Biological Oxygen Demand incubator). The samples which did not grow after 45 days of incubation were reported as No Growth.

The macroscopy appearance of colony was observed and recorded for those tubes showed growth and was also subjected to LPCB (Lacto Phenol Cotton Blue) mount. Based on the macroscopy and microscopic features dermatophytes spp were identified. [Fig-1 to 11] showing the microscopy and macroscopy features of dermatophytes)

Results

Among the 108 non repetitive patient samples included in the study, 65.7% (71) were males and 34.2% (37) were females. The male to female ratio is 1.9:1. The age wise distribution of the study population is shown in the [Table-1]. Out of the 108 samples, KOH mount was positive for fungal elements in 104 samples and the comparison of KOH positive and culture positive is shown in the [Table-2]. The clinical distribution of the study sample is shown in the [Fig-1]. The predominant clinical presentation was *Tinea corporis* 57%. Out of the 52-culture positive sample *Trichophyton mentagrophytes* 75 % (39) was the predominant dermatophyte isolated followed by *Trichophyton rubrum* 17 % (9), *Microsporum gypsum* 6% (3) and *Microsporum canis* 2 % (1). Dermatophytes isolated from various clinical types are shown in the [Fig-2].

Discussion

Dermatophytosis and dermatomycosis, although not devastating or lethal, are the commonest fungal infections in India [5]. One of the important issues in these fungal infections is purely cosmetic and itching for which almost all patients seek medical management. In today's situation apart from the above issue, drug resistance also has a significant role in management of skin fungal infections. The present study was designed as a cross-sectional study done at Sri Ramachandra Hospital, tertiary care center. Samples were taken from outpatient department of dermatology. Of the 3,547 number of patients screened for superficial fungal infections of skin and its appendages, 108 had skin lesions resembling *Tinea*. Most of our culture positive patients belong to the age group between 21-50 years. This is also in concordance with the literature evidence from the study by Mahajan, et al., (2017) [6] and Maulingkar, et al., (2014) [9]. Of the 108 positive KOH samples, 71 (65.74%) were male and 37 (34.25%) were female. As per our study, most of the samples were taken from males compared to females. This is comparable with almost all the studies done and published in the literature.

Studies done by Noronha, *et al.*, (2016) [2] Poluri, *et al.*, (2015) [5] and Bhatia and Sharma (2014) [3] have all documented male preponderance. Literature evidence globally suggests that more than 50% of the patients visiting dermatology clinic show *Tinea corporis* being the most common type of presentation followed by *Tinea cruris*. We in our study also had about 57% patients presenting with *Tinea corporis* followed by 13% of *Tinea capitis* and 10% of *Tinea cruris*. Surendran, *et al.*, (2014) [1] also noted *Tinea corporis* as the most common clinical type (44.3%). In contrast Adane Bitew (2018) [4] from Ethiopia in his study presented with *Tinea capitis* as the commonest type. According to Noronha, *et al.*, (2016) [2] *Tinea capitis* was common in the age group of 0-10 years. This is because of the lack of fungistatic action of sebum in the scalp of prepubertal children. In our study, 13% of the study population presented as *Tinea capitis* and none of them were in the age group of 0-10 years. *Tinea unguium* was more common among the age group of 31-40 years (43.8%), and further females (56.2%) were more commonly affected compared with males (43.8%). Most of the studies done in India say the commonest isolate being *T. mentagrophytes* and *T. rubrum*. Even in our study *T. mentagrophytes* accommodated for 75% (n=39) of the isolates followed by *T. rubrum* of 17% (n=9) isolates. The rest of the 6% (n=3) is constituted by *M. gypseum* and 2% (n=1) of *M. canis* [2-4]. *Trichophyton rubrum* and *Trichophyton mentagrophytes* were the predominant isolates in majority of the studies irrespective of the clinical type or region. Dermatophytes tend to re-occur, reasons for the recurrence could be continued exposure to the same source or persistence of some risk factors [10]. These organisms are assuming greater significance due to the excessive use of immunosuppressive drugs for controlling serious infections as well as non-infectious condition [8].

Conclusion

Even though incidence rate skin fungal infections are decreasing at least in the urban area it is better to do a mycological investigation of KOH wet mount isolation, speciation and antifungal susceptibility testing of the isolates to know the epidemiology and effectively managing the same.

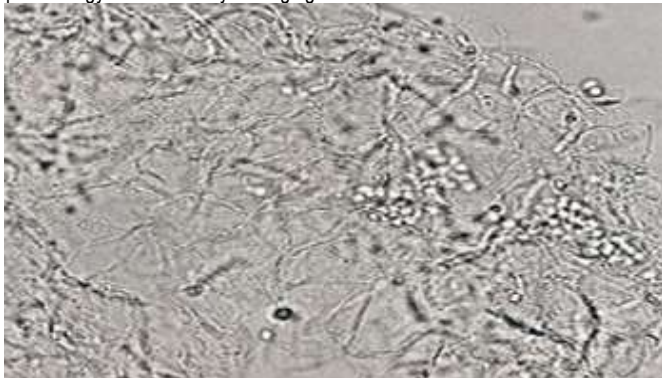


Fig-1 KOH mount showing fungal elements



Fig-2 Powdery colonies-*Trichophyton mentagrophytes*

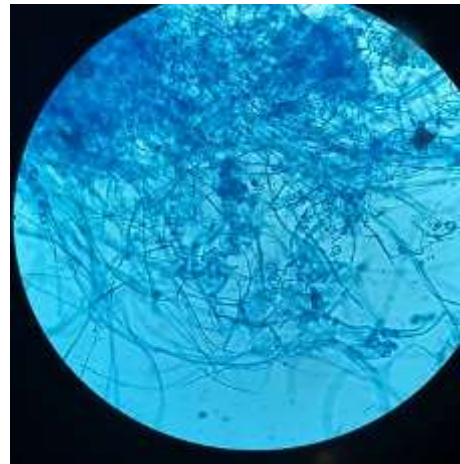


Fig-3 Spiral hyphae seen in LPCB mount – *Trichophyton mentagrophytes*



Fig-4 Velvety colonies of *Trichophyton rubrum*



Fig-5 Brown pigment on reverse side- *Trichophyton rubrum*

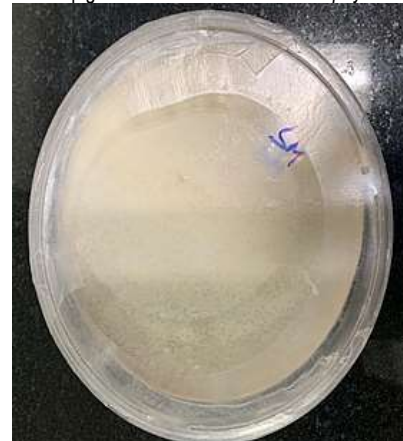


Fig-6 Powdery colonies of *Microsporum gypseum*

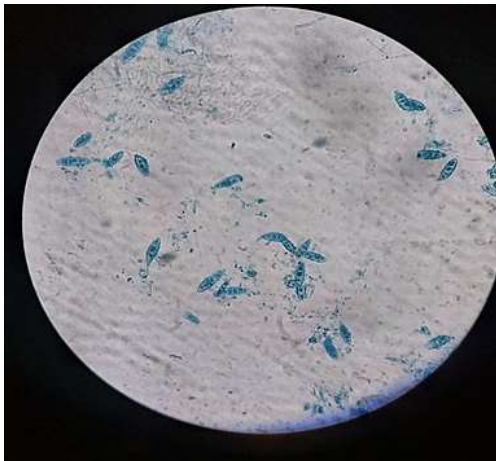


Fig-7 LPCB mount with numerous ellipsoidal macroconidia of *Microsporum gypseum*



Fig-8 White & wooly colonies of *Microsporum canis*

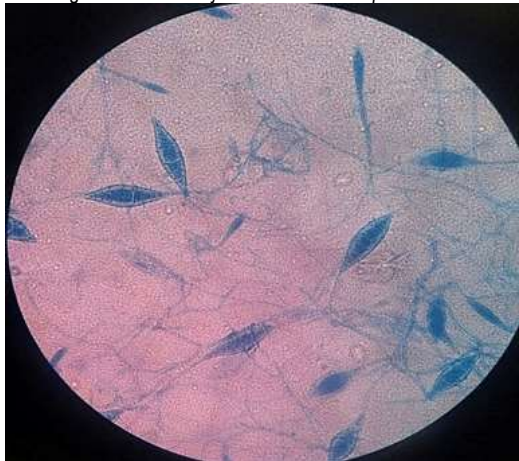


Fig-9 LPCB mount showing numerous macroconidia of *Microsporum canis*



Fig-10 Slide culture by Riddell's method.



Fig-11 Urease test positive for *Trichophyton mentagrophytes* (Pink) and negative in *Trichophyton rubrum*

Table-1 Age distribution among all 108 samples

Age Group	Number
0-10	0
Nov-20	8
21-30	26
31-40	24
41-50	25
51-60	15
61-70	7
71-80	3

Table-2 Culture and microscopy of dermatophytes

Culture	KOH Positive	KOH Negative	Total
Positive	50	2	52
Negative	54	2	56
Total	104	4	108

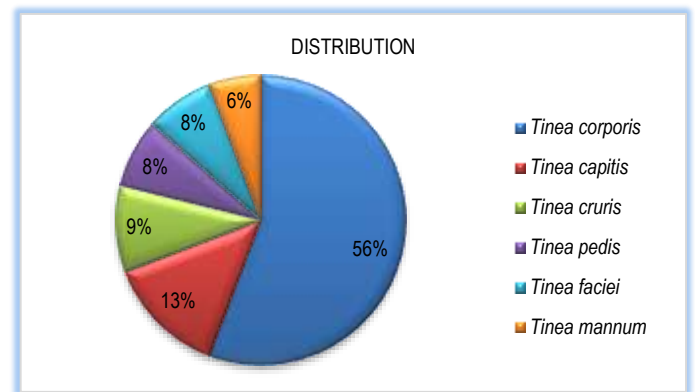


Fig-12 Showing clinical distribution of lesions

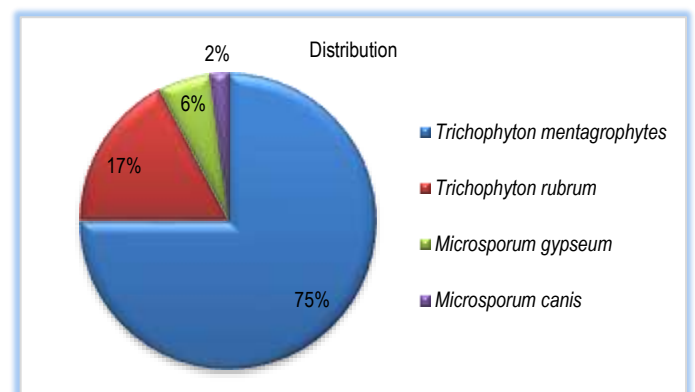


Fig-13 Showing the distribution of isolates

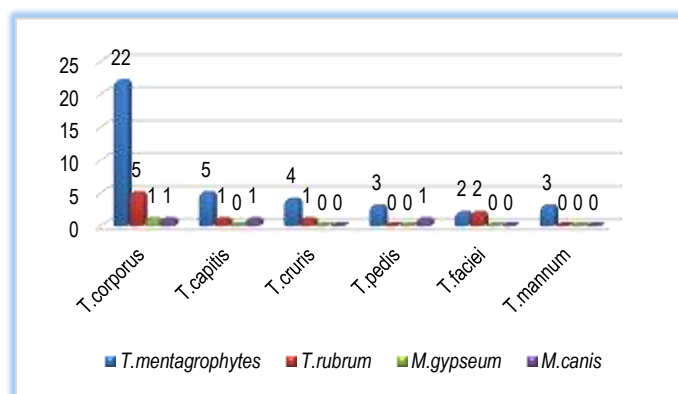


Fig-14 Distribution of isolates from clinical lesions

Application of research: Earlier commonest cause of dermatophytosis was *Trichophyton rubrum* but, recently the trend is changed and the current study and other literature evidences are in favor of *Trichophyton mentagrophytes*, hence studies of such kind helps to know the current trend of dermatophytosis.

Research Category: Medical Mycology & Dermatophytosis

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Study area / Sample Collection: Department of Microbiology, Sri Ramachandra Institute of Higher Education and Research, Porur, Chennai, 600116, Tamil Nadu

Conflict of Interest: No conflict of interest

Ethical approval: Ethical approval taken from Sri Ramachandra Institute of Higher Education and Research, Porur, Chennai, 600116, Tamil Nadu. Ethical Committee Approval Number: Ref No: CSP-MED/18/FEB/42/40.

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