Innovations in Pharmaceuticals and Pharmacotherapy

www.innpharmacotherapy.com

eISSN: 2321–323X
pISSN: 2395-0781

Research article

Clinico-mycological spectrum of dermatophytoses in Chennai

Suganthi M, Anand. B. J, Thenmozhivalli, Selvi, Dillirani
Department of Microbiology, Government Kilpau Medical College, Chennai, Tamilnadu, India

Abstract

Dermatophytes are common causes of skin, hair and nail infections and their clinic-mycological spectrum keeps changing with time and place. Aim: This prospective cross sectional study was conducted to analyse the clinical profile dermatophyte infections and dermatophytes causing them in Chennai. Methods: From 170 clinically suspected dermatophytosis patients not receiving antifungal were selected with consent and relevant history was collected. Skin scrapings/nail clippings/plucked hair samples were collected and subjected to 10% KOH and culture on Sabouraud dextrose agar with cycloheximide. Dermatophytes grown in culture were identified based on macroscopic and microscopic morphology, biochemical tests whenever required. Results and Conclusion: Onychomycosis and tinea corporis were commonest manifestations. Among the 170 patients, 60 patient samples were positive for dermatophytes. *Trichophyton rubrum* was the commonest organism responsible in this region

Keywords: Dermatophytes, skin, hair and nail infections, clinic-mycological, antifungal

***Corresponding author: Dr. Suganthi. M,** Department of Microbiology, Government Kilpau Medical College, Chennai, Tamilnadu, India. E- mail: suganlalith@gmail.com

1. Introduction

Dermatophytosis belonging to three genera Trichophyton, Microsporum and Epidermophyton together account for the maximum share among the fungal infections affecting skin and its appendages throughout the world [1, 2]. Though dermatophytes generally do not cause serious and life-threatening infections, they do cause significant morbidity due to temporary cosmetic disfigurement and discomfort due to associated itching.

Distribution of dermatophytes varies with geographical regions and with time in the same geographical region [3]. People in a particular area can be at risk of developing dermatophytosis which varies with climatic conditions, cultural and personal habit factors, etc. Source of the infection can be dermatophytes from other infected men (anthropophilic), infected animals (zoophilic) or soil with infective fungal elements (geophilic). Periodical analysis of possible changes in the clinicomycological factors related to dermatophytosis and potential risk factors responsible for them could help in better prevention and effective treatment. The present study was conducted to analyses the current dermatophyte spectrum and some related clinico-epidemiological features associated with them in Chennai as dermatophytosis is a common problem in this population.

2. Materials and methods

It was a cross sectional studies of patients attending the dermatology outpatient department at Stanley Medical College and

Hospital, Chennai, India between May 2008 and Jun 2009. The study was approved by institutional ethics committee and consent was obtained from all the enrolled patients. A total of 170 patients having clinically diagnosed dermatophytosis and not undergoing treatment for the same were included in the study.

Sample collection and processing

Relevant personal and clinical details were collected using a proforma. Skin scraping/ nail clippings/ plucked hair samples were collected, based on the lesion, in sterile paper packets. All the samples were screened for fungal hyphae with 10% KOH mounts and were inoculated on to Sabourauds Dextrose agar (Emmon's modification; SDA) containing chloramphenicol (50 mg/L) and cyclohexamide (500 mg/L) and into a second SDA slant with gentamicin to detect the growth of other non-dermatophytes in the clinical samples. The slopes were incubated at 25˚C and examined at regular intervals for evidence of fungal growth. Slopes not showing growth after 4 weeks of incubation were considered no growth. The isolates obtained were inoculated onto Potato dextrose agar for better conidiation, and also on to Blood agar slopes and modified Christensen's urease medium for differentiation of species. Slide cultures were put up whenever necessary. Isolates were identified based on standard mycological protocols [4].

Statistical analysis

Data were presented in frequency, percentages and mean±SD. Student t-test was used to find out statistical difference between two groups. P value less than 0.05 was considered as significant. Data has been documented as table and figures.

3. Results

Out of 170 patients enrolled, 54% were males and 46% females. The study population comprised mostly in the 10-50 years age group (90%, Figure 1)

Table 1 – Clinical types of dermatophytosis and results of KOH examination and culture from the specimens obtained from each type

S N	Lesion type	KOH wet mount positive, culture positive	KOH wet mount negative, culture positive	KOH wet mount positive, culture negative
1	Tinea corporis (n=15)	12 80%	3 20%	2 13.3%
2	Tinea cruris (n=8)	6 75%	2 25%	3 37.5`%
3	Tinea capitis (n=7)	4 57.1%	3 42.8%	1 14.2%
4	Tinea mannum (n=4)	3 75%	1 25%	2 50%
5	Tinea pedis (n=3)	2 66.6%	1 33.3%	0
6	Tinea barbae (n=2)	1 50%	1 50%	0
7	Tinea unguium (n=21)	14 66.6%	7 33,3%	5 23.8%
Total	60	42 (70%)	18 (30%)	13 (7.6%)

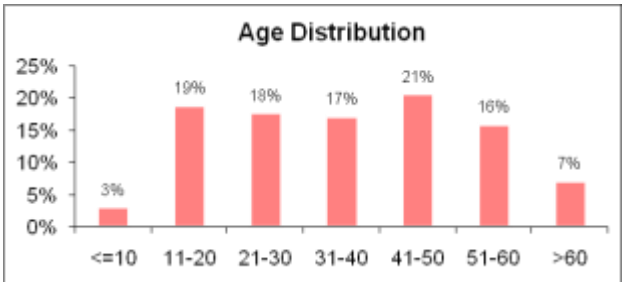

Figure 1 – Age distribution of study population

Tinea unguim and tinea corporis were the common clinical types of dermatophytosis in the study population (Table 1). From the 170 subjects, dermatophytes were isolated from 60 (35.2%) patients, fungi other than

dermatophytes of doubtful pathological significance were isolated from 62 (36.4) and no fungus could be isolated from the remaining 48 (26.9%) patients.

Of the 60 culture positive isolates, 42 (70%) were both KOH wet mount positive and culture positive, 18 were KOH negative and culture positive and 13 were KOH positive and culture negative (figure 2).

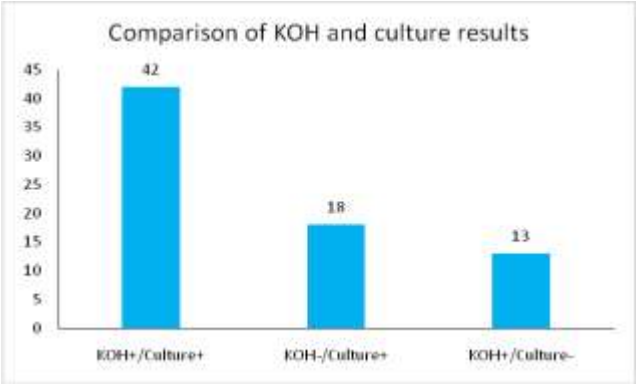

Figure 2 – Comparison of results of KOX and culture tests

Dermatophytes belonging to Trichophyton genus (55, 91.66%) were significantly more common among the isolates followed by Microsporum (3, 5%) and Epidemophyton genera (2, 3.33%) (Table 2).

Dermatophyte	No. of isolates (%)
T.rubrum	16 (26.60)
T.mentagrophytes	13 (21.60)
T.tonsurans	10 (16)
T.verrucosum	8 (13)
T.violaceum	6 (10)
T.shoenleinii	2 (3.30)
M.audouini	2 (3.3)
M.gypseum	1 (1.60)
E.floccosum	2 (3.3)
Total	60 (100)

Among the 170 patients, 10 (5.8%) had exposure to other people with similar lesions and 18 (10.50%) had contact with animals. Upon follow-up, 36 (21%) patients did not complete the recommended antifungal therapy.

Discussion

Dermatophytoses are major agents of cutaneous mycoses and remain a general public health problem [5]. Though dermatophytosis do not lead to mortality, they are responsible for considerable morbidity among the affected due to their chronicity and cosmetic disturbances. Their common prevalence in most of the parts of the world and ease of spread necessitates periodical analysis of their epidemiology in any geographical region especially so in area like ours where many risk factors are commonly seen. The present study was conducted to analyze the epidemiology of dermatophytosis in Chennai.

The study population was composed of 170 clinically suspected dermatophyte infections of skin, hair or nail attending a public tertiary care hospital. Dermatophytosis was found to be more common in men than women; similar observations have been made in other studies [6]. Physically more active young and middle aged groups were more commonly affected than the extremes of age. This may be due to greater physical activity and increased sweating in this age group favouring the growth of dermatophytes [5i]. Men are generally affected more commonly because of their more outdoor activities, exposure to other infected people, dressing pattern, physical activity leading to sweating and also more common healthcare seeking behaviour than women [7, 8].

In this population onychomycosis was the most common dermatophytosis followed by tinea corporis. In mostof the similar studies, tinea corporis has been reported as the commonest dermatophytosis [1,2,5,9]. As the study group did not comprise of any specific group occupationally at risk of developing onychomycosis (e.g, requiring soaking hands in water for a long duration, etc) the exact reason for higher prevalence of onychomycosis could not be explained. Extended study with a larger sample size with special emphasis on the risk factors for onychomycosis is required for confirming our findings and evaluating the factors responsible.

Trichophyton was the commonest genus and *Trichophyton rubrum* was the commonest dermatophyte species isolated from the study group similar to most of the other studies in this region and elsewhere [1,5,9,10]. Dermatophyte

isolation rates were 35.2% which is low compared other similar studies which ranged from 40-85% [1,5,10]. This could be due to non-viability of those fungal components in the specimens. Other possible factors for varying isolation rates could be due to various factors involved in collection, transporting and inoculation of the specimens, culture conditions, severity and type of the clinical illness [11]. Combined KOH and culture tests yield a better result compared to the individual tests. Usage of dermatophyte test medium helps in obtaining the growth earlier but is not superior to Sabouraud dextrose agar with cycloheximide in morphological identification of dermatophytes [6].

People involved in agricultural activities and students are found to be at the highest risk of dermatophytosis as per previous studies [1,8]. Source of infection can be infected people, animals and soil. Exposure to pet/domestic animals was seen in 10.5% and history of contact with infected people was seen in 5.8% of the study group. Recurrence of dermatophytosis has been reported in around 10%. [1] A study done in Chennai has found that around 2/3 of the dermatophytosis patients belonged to very low and low socioeconomic group and high rate of humidity, overpopulation and poor hygienic conditions are ideally suited for the development of dermatophytes [9].It is also reported that, only severe or chronic infection compelled the patients to attend the hospital, while early lesions remained neglected and unnoticed [9].

Epidemiology of dermatophytosis keeps changing and studies such as this one provide valuable information in prevalence, changing trends, etc [1,2]. The data will be useful in planning policies to prevent and control such infections among at risk persons and also help in creating public awareness about the problem [10].

Conclusion

In this region onychomycosis and tinea corporis are the commonest presentations of dermatophytosis. *Trichophyton rubrum* is the commonest etiological agent.

Reference

[1] Agarwal, U., Saran, J., & Agarwal, P. (2014). Clinico-mycological study of dermatophytes in a tertiary care centre in northwest India. *Indian journal of dermatology, venereology and leprology*, 80(2), 194.

[2] Sahai, S., & Mishra, D. (2011). Change in spectrum of dermatophytes isolated from superficial mycoses cases: First report from Central India. *Indian Journal of Dermatology, Venereology, and Leprology,* 77(3), 335.

[3] Seebacher, C., Bouchara, J. P., & Mignon, B. (2008). Updates on the epidemiology of dermatophyte infections. *Mycopathologia*, 166(5-6), 335-352.

[4] Rippon J.W. Medical Mycology, Dermatophytosis and Dermatomycosis, 3rd edition, P 267

[5] Lakshmanan, A., Ganeshkumar, P., Mohan, S. R., Hemamalini, M., & Madhavan, R. (2015). Epidemiological and clinical pattern of dermatomycoses in rural India. *Indian journal of medical microbiology*, 33(5), 134.

[6] Poluri, L. V., Indugula, J. P., & Kondapaneni, S. L. (2015). Clinicomycological study of dermatophytosis in South *India. Journal of laboratory physicians,* 7(2), 84.

[7] Seebacher, C., Bouchara, J. P., & Mignon, B. (2008). Updates on the epidemiology of dermatophyte infections. *Mycopathologia*, 166(5-6), 335-352.

[8] Sharma, M., & Sharma, R. (2012). Profile of Dermatophytic and Other Fungal Infections in Jaipur. *Indian journal of microbiology*, 52(2), 270-274.

[9] Ranganathan S, Menon T, Sentamil G S. Effect of socioeconomic status on the prevalence of dermatophytosis in Madras. Indian J Dermatol Venereol Leprol 1995;61:168.

[10] Lone, R., Bashir, D., Ahmad, S., Syed, A., & Khurshid, S. (2013). A study on clinico-mycological profile, aetiological agents and diagnosis of onychomycosis at a government medical college hospital in kashmir. *Journal of clinical and diagnostic research*: JCDR, 7(9), 1983.

[11] Agarwal, U., Saran, J., & Agarwal, P. (2014). Clinico-mycological study of dermatophytes in a tertiary care centre in northwest India. *Indian journal of dermatology, venereology and leprology*, 80(2), 194.