International Journal of Pharmaceutical Science Invention
ISSN (Online): 2319 – 6718, ISSN (Print): 2319 – 670X
www.ijpsi.org Volume 3 Issue 8 ǁ August 2014 ǁ PP.43-46

Clinicomycological profile of Dermatophytosis in a teaching hospital

[1]Dr Rashmi P Mahale, [2]Dr M Raghavendra Rao,[3]Dr Tejashree A, [4]Dr Deepashree R, [5]Dr Madhuri Kulkarni
(Department of Microbiology, JSS Medical College, JSS University, Mysore, India)

ABSTRACT: *Dermatophytes are a group of keratinophilic fungi that have the capacity to invade keratinized tissues. Dermatophytosis is a common fungal infection seen in the tropical and subtropical countries affecting the skin and its appendages. Though dermatophytosis is considered a cosmetic illness, complications do occur. In the recent times dermatophytosis appears to be a neglected fungal disease. This study was taken up to detect clinicomycological profile of dermatophytosis.Aims and Objectives: This study is an attempt to access the clinicoepidemiological profile of dermatophyte infection and to find out various species of dermatophytes in clinically suspected cases of dermatophytosis.Materials and methods: One hundred and seventy seven samples were subjected to direct microscopy by potassium hydroxide wet mount (KOH) and isolation by culture on Sabourauds dextrose agar.Results: Of the 177 samples, 115 were KOH positive and 108 were culture positive. Males were more frequently affected with dermatophytosis. T.rubrum was the most common clinical isolate. Conclusion: The present study highlights the use of both KOH and culture in the diagnosis of dermatophytosis.*

KEYWORDS : *Dermatophytes, dermatophyyosis, Tinea, Trichophyton*

I. INTRODUCTION

Dermatophytes are the most common cause of fungal infections worldwide. The WHO estimates global prevalence of dermatomycoses to be approaching 20 %[1). Dermatopytes are a group of filamentous fungi that are the most common cause of superficial/cutaneous mycoses. Dermatophytes are grouped into three genera namely Tricophyton, Microsporum and Epidermophyton. Dermatophytes are also classified according to their habitat, being either anthropophilic associated with humans, zoophilic associated with animals or geophilic associated with soil. Anthropophilic species are responsible for the majority of human infections and tend to be chronic with little inflammation. Infection caused by zoophiles and geophiles are associated with acute inflammation [(2)]. Infections caused by these fungi are called dermatophytosis or ring worm infections and affects the skin, nail and hair. Infection is restricted to the nonliving cornified layers because of the inability of the fungi to penetrate the deeper tissues in an immunocompetent host. The infections are named after the part of the body that is affected like tinea pedis is the infection of the foot, tinea unguium is the infection of the nails. Although dermatophytosis is a superficial infection, immunocompromised patients may experience severe disseminated disease [(3)]. Dermatophytosis is common in the tropical and subtropical countries including India where the hot and humid climatic condition helps in acquisition and maintenance of the mycotic disease [(4) (5)].

II. MATERIALS AND METHODS

Patients clinically suspected with dermatophytosis were included in the study. Patients were examined and classified into different clinical types depending on the site involved. Skin scrapings were collected from the advancing edge of the lesion; basal root portion of the infected hair was collected by plucking the hair with sterile forceps. Nail clippings along with subungual debris were collected from the infected nail. The collected samples were divided into two portions; the first portion of the sample was used for microscopy using 10-40% KOH and then the slide was screened for the presence of fungal hyphae. The second portion of the sample was cultured on sabourauds dextrose agar slopes with chloramphenicol (0.05%) and cycloheximide (0.05%). Cultures were incubated at 25^0C for 4-6 weeks and the slopes were checked twice a week for the presence of growth. Mycological identification of the isolate was done based on macroscopic and microscopic examination. Macroscopic examination included rate of growth, colony morphology and pigment production. Microscopic examination of lactophenol cotton blue mount was done for the presence, shape and arrangement of macro and microconidia. Other tests like hair perforation test, urease test were done to identify the isolates.

III. RESULTS

177 samples from clinically suspected cases of dermatophytosis were processed. Out of these 92 were skin scrapings, 52 were nail clippings, and 33 were hair samples. Males were more commonly affected than females, with a male to female ratio of 1.6:1. First decade (23.1%) and fourth decade (23.1%) of life were the most common age group in which Clinical suspicion of dermatophytosis was made.

Table 1: Age wise distribution of clinical samples.

Age Group	Hair(33)	Skin(92)	Nail(52)	Total
1-10	24	10	7	41
11-20	3	10	6	19
21-30	3	21	9	33
31-40	1	22	7	30
41-50	-	25	16	41
>50	2	4	7	13
Total	33	92	52	177

Skin and nail infections were the common presentation in 41-50 years age group, were as T.capitis was commonly suspected in 1-10 years age group. Among the skin infections, T.corporis was the most common clinical presentation (31.1%) followed by T.unguium (29.3%).(table 2) Among the 177 samples processed, 115 (64.9%) samples were positive for fungal filaments by KOH preparation and 108 (61.01%) samples yielded growth. Out of the 115 KOH positive samples, 14 samples did not yield growth, however 7 samples were negative for fungal filaments by KOH preparation but yielded fungal growth.

Table 2: Correlation between clinical type, KOH and culture.

Clinical Types	KOH + Culture +	KOH + Culture -	KOH - Culture +	KOH – Culture -
Skin (92) T.coporis(56) T.cruris(26) T.Pedis(8) T.Mannum(2)	59 32 19 6 2	11 3 6 2 0	0	22
Nail (52)	17	2	5	28
Hair (33)	25	1	2	5

Of the 26 KOH positive hair samples, 19 (73.07%) samples had endothrix type of hair infection and the remaining 7 samples had ectothrix type of infection. Among the culture isolates, T. rubrum was the commonest dermatophyte isolated. It was also the predominant isolate from hair samples and was responsible for most of the endothrix type of infection. Of the 22 nail samples which yielded growth, 17 (77.27%) were due to non dematophytes and only 5 (22.27%) samples yielded growth of dermatophytes .Non dermatophyte infections were common among nail samples.(Table3)

Table 3: Correlation of dermatophyte species with clinical samples.

Isolates	Culture + Hair (27)	Culture + Nail (22)	Culture + Skin (59)	Total (108)
T.rubrum	3	2	32	37
T.verrucosum	20	1	5	26
T.tonsurans			2	2
T.mentagrophtes	1	2	14	17
T.schoenleinII	1			1
E.floccosum			6	6
Microsporum.spp	2			2
Trichospon.spp	0	1		1
Candida.sp		9		9
Fusarium		5		5
Penicillium		1		1
Aspergillus		1		1
Total	27	22	59	108

IV. DISSCUSSION

The present study evaluated the occurrence of dermatophyte infections and the prevalence of the different dermatophyte species.In the present study the peak incidence of dermatophytosis was seen in the first (23.1%) and fourth decade (23.1%) of life. The predominant presentation in the first decade of life was Tineacapitis, similar observations were made by BV Peerapur et al[(6)] and Bindu et al[(7)]. The frequent association of T. capitis in young children may be due to acquisition of the infection by direct contact with infected humans and animals, exposure to contaminated soil or fomites[(8)], or due frequent shaving of the scalp and sharing of caps among children. A decrease in the incidence of T.capitis with age may be due to the post pubertal changes in hormones which results in acidic sebaceous gland secretions[(9)]. In the present study, males were more prone to dermatophytosis especially T.corporis, similar findings have been reported by other researchers [(6), (10), (11)] and has been attributed to increased sweating in young males due to vigorous outdoor activity.

Though culture is thought to be the gold standard for the diagnosis of dermatophytosis, in our study, fungal elements were seen by KOH preparation in (115) 64.9% samples and culture was positive in only 108 (61.01%) samples. This may be due to the non viability of fungi due to use of antifungal agents prior to sample collection or could be due to absence of the fungi in the portion of the sample used for culture. Similar KOH positivity rates have been reported in studies conducted by BV Peerapur et al [(6)] and Clarissa JL nyngdoh et al. [(12)] In our study, seven samples which were KOH negative yielded growth, this could be attributed to the inactive sporulating phase of the fungi which is difficult to see by microscopy [(13)] and also depends on the skill of the observer. This finding highlights the importance of both culture and KOH in the diagnosis of superficial fungal infections.

Among the various dermatophytes isolated, T.rubrum was the predominant one, amounting to 34.25% and was also the commonest agent causing skin infections; this is in comparison with the study by Clarissa et al [(12)] and other researchers [(14)]. T.violecium was the next common isolate followed by T.mentogrophytes. T.violecium was the predominant fungi causing endothrix type of hair infection. T.schoenleinii was isolated from a case of endothrix type of hair infection. Out of the 22 nail samples which yielded growth, 9 were due to non dermatophytes. Higher prevalence of T.rubrum causing skin infections may be due to the ability of the fungi to adapt well to skin surfaces and cause chronic infections and also the ability of the spores to survive in varied habitats. [(15), (16)]

V. CONCLUSION

Though mycological culture gives a definitive diagnosis, it is time consuming. Direct microscopy using KOH wet mount is quick, simple and inexpensive method of diagnosing fungal infections. When either of the method is used alone, it may result in false negative reporting. The present study highlights the use of both KOH and culture in the diagnosis of dermatophytosis..

VI. ACKNOWLEDGEMENTS

We thank Department of dermatology JSSH hospital, Mysore for providing the clinical samples for this study.

REFERENCES

[1] S A Marques, A M Tortorano, M A Tuculet, R Negroni and R P Mendes, "Mycoses associated with AIDS in the third world" Medical mycology, Vol 38, no. 1 pp 269-279. 2000.
[2] I Weitzman and R C Summerbell, " The dermatophytes", Clinical microbiology reviews, vol. 8, no. 2, pp240-259, 1995.
[3] Rodewll, G E J, C L Bayles, T Towersey and R Aly, 2008 "The prevalence of dermatophyte infection in patients infected with HIV. International journal of Dermatology, 47:339-343.
[4] Rippon J W "The pathogenic fungi and pathogenic actinomycetes. 3rd Edition. W B Saunder, Philadelphia, 1988.
[5] Rao A (1959) Mycotic diseases in India- a critical review. Bulletin of school of tropical medicine, Calcutta, 13-22.
[6] B V Peerapur, A C Inamdar, P V Pushpa, B Srikant Correspondence "Clinicomycological study of dermatophytosis in Bijapur" Indian Journal of medical microbiologists, 2004, vol. 22, issue 4 page-273-74.
[7] Bindu V, "Clinicomycological study of dermatophytes in Calicut, India Indian journal of Dermatol venerol leprol 2002; 68:259-61.
[8] Andrew's M D, Burns M "Common Tinea infections in children" Am Fam Physicians. 2008 May 15; 77(10):1415-20.
[9] Philpot C M "Some aspects on the epidemiology of tinea. Mycopathologia 1997; 3: 62.
[10] SurichiBhagra, SuniteA et al "Mycological pattern of dermatophytosis in and around Shimla hills" Indian journal of Dermatology. 2014, vol 59:3, 268-70.
[11] Vikesh Kumar Bhatia and Prakash Chand Sharma "Epidemiological studies on Dermatophytosis in human patients in Himachal Pradesh, India. Springer Plus 2014, 3:134.
[12] Clarissa J L Nyngdoh et al "Clinicomycological profile of dermatophytosis in Meghalaya. International journal of Med and Public health. 2013,3 : 4, 254-56.
[13] Midgley G, Moore M K, Cook C, Phan QG "Mycology of nail disorders." Journal of Am Acad Dermatol 1994, 31: 68.
[14] Madhavi S, RanaRao M V, Jyothsna K, "Mycological study of dermatophytosis in rural population." Ann Biol Res 2011: 288-93.
[15] Dahl M V, Grando S A, "Chronic dermatophytosis: What is special about Trichophytonrubrum?" Adv Dermatol 1994; 9: 97-107.
[16] Woldeamanue Y, Leekassa R, Chryssanthon E, Mengistu Y, Petrini B, "Clinicomycological profile of dermatophytosis in a reference centre for leprosy and dermatological diseases in Addis Ababa." Mycopathologia 2006; 161: 167-72.