



THE PREVALENCE OF DERMATOPHYTOSIS AND ONYCHOMYCOSIS AT A TERTIARY CARE HOSPITAL

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ABSTRACT

In recent years, fungi have been emerging more common infection in immunocompromised patients of tertiary care centers. The retrospective analysis for a period three years was undertaken to know the prevalence of dermatophytosis and onychomycosis at a tertiary care Hospital. The samples were collected from the clinically suspected cases. The direct microscopy with potassium hydroxide (KOH) was done to visualize the presence of fungal elements and Gram staining was done for any suspected yeast infection. Fungal culture of all samples were inoculated on two different culture media; one sabourauds dextrose agar (SDA) and the other SDA with chloramphenicol and cycloheximide. A total of 200 clinical samples suspected fungal etiology were included for a period of three years. Skin scraping accounts 150(75%) followed by nail clipping 50 (25%). *Trichophyton species* 20(28%) was the predominant fungal isolate and followed by *Aspergillus niger* 10(14%) and others accounts less percentage. The wet mount preparation of KOH can be used as a screening test for presumptive diagnosis of fungal infections. Laboratory confirmation should be undertaken and fungal infection must be ruled out before prescribing corticosteroids and antibacterial agents.

Key words: Dermatophytosis and Onychomycosis.

INTRODUCTION

In recent years of study related to fungal infections revealed that yeast and moulds have emerged as important pathogens [1]. Superficial fungal infections (mainly skin and nail) are the world's most common diseases and the prevalence of superficial mycotic infection has risen since past decade. The total scenario about the epidemiology of the fungal infections has changed due to Acquired Immunodeficiency Syndrome (AIDS), organ transplants, malignancy, immune suppressive drugs etc.

The fungal isolates, which used to be discarded as a laboratory contaminants are playing a significant role in pathogenicity of the most infections. These organisms are now capable of affecting not only the immunocompromised patients but also healthy individuals.^[2] Some fungal infections seen more commonly in hospitalized patients and these patients are often severe and difficult to diagnose. Early initiation of antifungal therapy

is critical in deducing the high mortality rate in these patients [1]. Rapid diagnosis of systemic fungal infections remains limited and culture detection of fungal isolates is often delayed due to slow or absent growth of fungal isolates from clinical samples [1].

Laboratory research work is needed for better isolation and identification of these pathogens. So we have undertaken this study to know the prevalence of dermatophytosis and onychomycosis at our Hospital.

MATERIALS AND METHODS

The retrospective study was conducted in the Department of Microbiology for a period of three years (January 2009 to December 2011). The aim of our study is to know the prevalence of dermatophytosis and onychomycosis at a tertiary care Hospital. The samples were collected from the patients presenting with clinically suspected fungal infections were included.

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The samples were collected under aseptic precaution and all the samples were analyzed by direct microscopy [potassium hydroxide (KOH) and Gram stain] and culture. For direct microscopic examination of nail clipping in 40% KOH and 10% KOH for other samples (skin scraping etc) were used to visualize the presence of fungal elements and for any suspected yeast infection Gram staining was done to look for gram positive yeast cells [1]. For fungal culture in all samples were inoculated in two different culture media, one sabourauds dextrose agar (SDA) and another SDA with chloramphenicol and cycloheximide [culture media obtained from Hi-Media Laboratories, Mumbai, India]. The culture tubes were incubated at 25°C and 37°C and examined the growth for six weeks. The identification of fungi was done by macroscopic examination of culture tubes; the characteristics considered in fungal identification were

texture, color and growth rate. The slide culture technique with lactophenol cotton blue mount shows characteristics such as mycelium, conidium types and hyphae more clear. The yeast isolates were identified by gram staining and germ tube test [1].

RESULTS

The most frequent sample received in the laboratory for fungal diagnosis was skin scraping accounts 105(75%) followed by nail clipping 50(25%). The comparison of microscopy and culture of clinical samples is shown in Table- 1; both positive 40(20%), only microscopy positive 28(14%) and only culture positive 32(16%). The relative proportions of fungal isolates obtained from clinical samples [Table -2]; the maximum positivity was seen in skin scraping 49(68%) followed by nail clipping 23(32%).

Table 1. Comparison of KOH and Culture of clinical samples

Microscopy KOH	Culture SDA	No. of Patients (%)
Positive	Positive	40(20%)
Positive	Negative	28(14%)
Negative	Positive	32(16%)
Negative	Negative	100(50%)
Total		200(100%)

Table 2. Relative proportions of fungal isolates obtained from clinical samples

Fungal isolates	Skin scraping	Nail clipping	Total (%)
<i>Fusarium species</i>	3	0	3(4%)
<i>Aspergillus flavus</i>	3	2	5(7%)
<i>Aspergillus niger</i>	2	8	10(14%)
<i>Aspergillus species</i>	3	1	4(6%)
<i>Trichophyton species</i>	20	0	20(28%)
<i>Curvularia species</i>	0	1	1(1%)
<i>Mucor species</i>	1	1	2(3%)
<i>Aspergillus nidulans</i>	2	2	4(6%)
<i>Candida species</i>	4	1	5(7%)
<i>Rhizopus species</i>	1	3	4(6%)
<i>Trichophyton rubrum</i>	4	0	4(6%)
<i>Trichophyton mentagrophytes</i>	4	0	4(6%)
<i>Epidermophyton floccosum</i>	1	2	3(4%)
<i>Aspergillus terreus</i>	0	1	1(1%)
<i>Aspergillus glaucus</i>	1	0	1(1%)
<i>Penicillium species</i>	0	1	1(1%)
Total	49 (68%)	23 (32%)	72(100%)

DISCUSSION

Fungi are widely distributed in nature and incidence of fungal infections has been increased since past two decades [2]. The common fungal infection is Dermatophytosis, 49 cases (68%), of which predominant isolate was *Trichophyton species* 20(28%), and followed by *Trichophyton rubrum*, *Trichophyton mentagrophytes* and *Candida species* 4 (6%), *Aspergillus flavus*, *Aspergillus species* and *Fusarium species* 3(4%).

Aspergillus nidulans and *Aspergillus niger* 2(3%), *Aspergillus glaucus*, *Epidermophyton floccosum*, *Rhizopus species* and *Mucor species* one (1%). Skin scales positive for fungal culture represents 68% in our study and it is more as compare to other study 64% [3]. According to other study [3] the predominant isolate is *Trichophyton rubrum* 41(42%), followed by *Microsporum canis* 30(30%), *Trichophyton mentagrophytes* 14(14%),

Microsporium gypseum 9(9%), *Trichophyton violaceum* 2(2%) and *Epidermatophyton floccosum* one (1%) [3]; the predominant isolate is dermatophytes in our study and it is concordant to with previous study. The next common is onychomycosis 23(32%) cases, fungal infection of nail is caused by dermatophytes, yeast and mold. In one study isolation rate of onychomycosis was found to be 40% [4] but in our study is less 32%. Various isolates from onychomycosis in one study, [4] *Trichophyton species* 35(44%), followed by *Candida species* 18(23%), *Aspergillus species* 16(20%), *Curvularia* and *Epidermatophyton species* 4(5%), *Alternaria*, *Fusarium* and *Penicillium species* one (1%) [4]. Here the, *Trichophyton species* is main causative agent of onychomycosis [4]. The major isolates from onychomycosis in our study, *Aspergillus niger* 8(34%), followed by *Rhizopus species* 3(13%), *Aspergillus flavus*, *Aspergillus nidulans* and *Epidermatophyton floccosum*

2(8%), *Aspergillus terreus*, *Aspergillus species*, *Mucor species*, *Penicillium species*, *Curvularia* and *Candida species* one (4%). Medical therapy remains gold standard but understanding of the aetiology of these infections can guide selection of effective treatment. The good quality and sufficient quantity of specimen is very much essential for accurate laboratory diagnosis. In our study 80-85% of fungal infections have been diagnosed based on the findings of microscopy alone and there was agreement ranging from 70-80% between direct microscopy and culture.

CONCLUSION

The prevalence of dermatophytosis is more as compared to onychomycosis in our study. Early diagnosis and proper management of dermatophytosis and onychomycosis could reduce the further consequences of fungal infections.

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