

A Study of Onychomycoses in a Tertiary Care Hospital

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ABSTRACT

Background: *Onychomycoses denotes infection of the nail caused by dermatophyte fungi, Non dermatophytic moulds or yeast. Onychomycoses affects approximately 5% of population worldwide.*

Objective: This study was done to know the etiological agent of onychomycoses.

Materials and Methods: *A total of 60 patients with clinically suspected onychomycoses considered for treatment were included in the study. Nail scrapings and nail clippings were collected after cleaning with 70% alcohol to remove contaminants. Samples were subjected to KOH for direct microscopic examination and culture was done using Sabouraud's Dextrose Agar with and without antibiotics.*

Results: *Direct microscopy with KOH, 28(47%) were positive and by culture 25 (42%) were positive. Most common Dermatophyte was Trichopyton rubrum (24%) and among Non Dermatophyte moulds Aspergillus was the most common agent. E. floccosum was not isolated.*

Conclusion: *Non dermatophyte moulds was most common etiological agent causing onychomycoses. KOH mount was found to be more sensitive than culture and helps in instituting early treatment.*

Keywords: *Onychomycoses, Dermatophytes, Non Dermatophytic Moulds.*

INTRODUCTION

Onychomycoses denotes infection of the nail caused by dermatophytic fungi, Non dermatophytic fungi or yeast. Onychomycoses affects approximately 5% of the population worldwide. It represents 20 - 40% of onychopathies and about 30% of mycotic cutaneous infection. In a small percentage of persons, onychomycoses may be caused by a

genetic defect that causes alteration in immune function.

Dermatophytes are the most common cause of onychomycoses; accounting for about 68% of all cases. Followed by yeast (11%) and non dermatophytes (11%). Among the dermatophytes most common organism is Trichophyton rubrum (53%) followed by

Trichophyton mentagrophytes var interdigitale (13%) Epidermophyton floccosum (1.2%) and Microsporum species.

The Non dermatophytic moulds Acremonium spp, Aspergillus spp, Fusarium spp, Onychocolatandensis, Scopulariopsis, Brevicaulis and Scytalidium dimidiatum accounting for approximately 4% of onychomycoses.

Yeast invade already damaged nails or nails in immunocompromised. Candida albicans is the most common yeast responsible (8%) followed by C.parapsilosis (1-2%) .

This study was carried out to know the etiological agent of onychomycoses and to institute appropriate antifungal therapy.

MATERIALS AND METHODS

This study was conducted in department of Microbiology, JSS Hospital from January 2014 to June 2014.

A total of 60 patients with clinically suspected onychomycoses considered for treatment were included in the study. Their ages ranged from 20 – 70yrs.

Nail clippings were collected using nail clippers after cleaning with 70% alcohol to remove contaminants. Scrapings were collected from the involved nail bed using no. 15 scalpel blade.

KOH Mounts:

A small piece of specimen was placed on the clean glass slide and 2-3 drops of Potassium hydroxide was added. A coverslip was applied to the preparation and was left 1-2hrs for digestion

of the specimen and then examined under microscope for fungal elements.

Culture:

The sample was also inoculated on to the Sabouraud's Dextrose Agar with and without antibiotics (Cycloheximide and Chloramphenicol). The cultures were incubated at room temperature observed for growth periodically, upto 4 weeks. The growth was observed for gross colony morphology and microscopic examination of lactophenol cotton blue preparations. Statistical evaluation of the results was done.

RESULTS

Out of the 60 patients, Direct microscopy with KOH mounts and culture gave positive results in 28(47%) and 25(42%) respectively as shown in Table 1.

Culture yielded growth of Dermatophytes in 10 cases (40%), Candida in 4 cases (16%), Trichosporon spp 1 case (4%) and Non-Dermatophyte moulds 10 cases (40%).

Among the Non Dermatophytes moulds, Aspergillus (4) was the most common agent followed by Fusarium (2), Cladosporium (2), Paeceliomyces (1), Acremonium (1) and Trichosporon mucoides (1).

Most common Yeast isolated was C.albicans (4) and Trichosporon mucoides (1).

T.rubrum was the most common Dermatophyte isolated in our study consisting of about 6. In 4 cases T.mentagrophytes was isolated. E.floccosum was not isolated in our study.

Out of 28 KOH positive samples 3 did not grow on culture.

Table 1 : Microscopic and Culture Examination of cases

KOH Smear	Culture		Total
	Positive	Negative	
Positive	25	3	28
Negative	0	32	32
Total	25	35	60

Table 2 : Statistical values

	KOH Smear
Sensitivity	100%
Specificity	91%
PPV	89%
NPV	100%

Etiological agents of Onychomycoses

Fungal Agent	Number (Total - 25)
Dermatophyte - Trichophyton rubrum	6
Trichophyton mentagrophytes	4
Yeasts – Candida albicans	4
Trichosporon mucoides	1
NDM – Aspergillus	4
Fusarium	2
Cladosporium	2
Paecilomyces	1
Acremonium	1

DISCUSSION

Both direct microscopy and in vitro laboratory culture of sample material are necessary to definitively identify the etiological agent. It is important to understand the limitations of direct microscopy to know the cause of onychomycoses. The test serves as the scoring tool for the presence and absence of fungi but cannot differentiate among the pathogens.

In our study, out of 60 samples screened 28 (46%) were positive by direct microscopy. The KOH positivity rate varied from 35.6% - 88.6% in various studies and culture positivity rate from 36% - 53.6%.

In KOH preparation, it is important to observe the hyphae, to determine if they are typical of dermatophytic fungi or have features of non dermatophytic moulds or yeasts which would help in the management of patients. In onychomycoses, direct microscopy is the most efficient screening technique.

High incidence of onychomycoses was found in younger age group of 20-30years in our study. Male to female ratio was found to be 1.8:1.

We found Non dermatophytic moulds as the most common agents in onychomycoses. Similarly high Non- Dermatophyte isolation has been isolated earlier. Though Non Dermatophytic moulds are often considered as contaminants, they have been reported to colonize damaged tissues and cause secondary tissue destruction. NDM have been isolated in 2- 22% cases and yeasts in 17-66% cases of onychomycoses in some studies.

In our study, higher rates of isolation of NDM 10 (40%) was seen and yeasts 5 (20%) were isolated.

We found that KOH positivity rate 47% fell within the reported range but had a comparatively slightly lower culture positivity rate (42%).

CONCLUSION

To conclude, our study showed male preponderance, Non Dermatophytic moulds as the most common etiological agent among the Dermatophytes, *T.rubrum* was the most common agent causing Onychomycoses. Earlier diagnosis helps in instituting appropriate treatment, as onychomycoses can lead to total nail dystrophy.

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