

Original Research Article

<http://dx.doi.org/10.20546/ijcmas.2016.504.053>

A Study of Nondermatophytic Dermatophytosis in Patients Attending a Tertiary Care Hospital in Vijayawada, Andhra Pradesh, India

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ABSTRACT

Keywords

Superficial mycosis,
Dermatophytes,
Non dermatophytes,
Non dermatophyte
moulds,
Candida,
Malassezia.

Article Info

Accepted:
15 March 2016
Available Online:
10 April 2016

The present study was done to know the etiological role of Nondermatophytes in cases of dermatophytosis. The study was conducted on 150 suspected cases of superficial mycosis. Direct microscopy by KOH mount and culture was undertaken to isolate the fungal pathogens. 107 out of 150 cases (71.3%) were positive by direct microscopy and 85 were culture positive among 150 cases. Males were affected more (65.3%) than females (34.7%). The commonest age group involved was 31-40 yrs. *Tinea corporis* was the most common clinical presentation (30%-45 cases). Dermatophytes were most commonly isolated agents (57.6%, 49 cases). Non dermatophytes were isolated from 36 cases (42.4%) and include non dermatophyte moulds (21.3%), *Candida* sps (17.6%) and *malassezia* sps (3.5%). The nondermatophyte moulds were the majority among the nondermatophytes among which *Aspergillus* spp were the most common. Others include *Curvularia*, *Fusarium*, *Scopulariopsis* etc. The *Candida* species isolated were *C.albicans*, *C.parapsilosis* and *C.krusei*. *Malassezia* was isolated from three cases. It was concluded that along dermatophytes, non dermatophyte fungi are also emerging as important causes of superficial mycosis.

Introduction

Dermatophytosis is the superficial fungal infection of skin and its appendages caused by Nondermatophytes (Jagadish chander, 2009). The Nondermatophytes responsible are yeasts (*Candida* and *Malassezia*) and Nondermatophyte moulds (Aruna Agarwal *et al.*, 2002). Their role in causing superficial infections have been well documented in many studies. Treatment of nondermatophyte infections is often difficult as topical and systemic antifungals are ineffective (EI Batawi *et al.*, 2006).

Dermatophytes and non dermatophytes are assuming greater significance both in developing and developed countries due to immuno compromised conditions like AIDS, cancer chemotherapy, neoplasm, immune suppressive drugs, excessive steroid use and metabolic disorders like Diabetes mellitus (Naidu J *et al.*, 1993; Dogra S *et al.*, 2002). So the present study was aimed to find out the role of Nondermatophytes as causative agents of dermatophytosis.

Materials and Methods

The present study was a prospective study, carried out in the Department of Microbiology, Siddhartha medical college, Vijayawada, Andhra Pradesh during a one year period from August, 2013 to 2014. A total of 150 cases attending the dermatology O.P were screened. A detailed clinical history including age, sex, duration, site and extent of infection, type of lesion, antifungal therapy and occupation of patients was taken. Patients were examined and grouped in different clinical types depending on the site of involvement. Clinical specimens like skin scrapings, infected hair (by hair plucking) and clipped nails were collected in small paper envelopes after cleaning the area with 70% alcohol. All specimens were subjected to direct microscopy for fungal elements in 10% & 20% KOH & culture in Sabouraud's Dextrose agar with chloramphenicol and antibiotics and with and without cycloheximide (Topley and Wilson, 2005). Tease mount, cellophane tape mount and slide cultures were undertaken for microscopic morphology. Pityrosporum versicolor cases were subjected to KOH mount and cultured on SDA with olive oil overlay (Jagadish chander, 2009) The culture studies and identification were done by standard methods.

Identification of Non-Dermatophyte Molds (NDM)

The NDM that are considered as pathogen for onychomycosis are *Aspergillus*, *Scopulariopsis* spp, *Acremonium* spp, *Fusarium* spp, *Curvularia* spp, *Penicillium* spp (Singal *et al.*, 2011), Molds are considered pathogens when the following criteria are fulfilled:

1. Nail abnormalities consistent with diagnosis.

2. Positive direct microscopy visualizing hyphae in the nail keratin
3. Failure to isolate a dermatophyte in the culture
4. Growth of more than five colonies of the same mold in atleast two consecutive nail samplings.(Tosti A, *et al.*, 2000)

Results and Discussion

A total of 150 clinically suspected cases were enrolled in the study comprising 98 (65.3%) males and 52 (34.7%) females with a male to female ratio of 1.8:1. None of them had any systemic disease Similar finding was observed by vyoma chudasama *et al.*(2014) with a male to female ratio of 2.1:1.The male preponderance may be correlated with the occupational hazards related to their nature of work, the frequent interaction with different people of the society. Majority of cases screened belonged to age group between 11-60 yrs. The highest number i.e., 32 (21.3%) patients belonged to 31-40 year age group. The probable reason for this age predilection is excessive sweating due to excessive physical activity, as a consequence, in addition the tropical climatic conditions. Similar findings were noted in studies of Amita pandey *et al.*, 2013. The most common clinical presentation is tinea corporis ie.45 cases(30%) followed by onychomycosis 38 (25.3%), tinea capitis 17 (11.3%), tinea cruris 16 (10.6%), tinea pedis 12 (8%), tinea corporis+cruris 7 cases(4.6%), tinea faciei and tinea mannum 4 each (2.6%) and pityriasis versicolor 7(4.6%).

Out of 150 cases fungal elements were seen in 107 cases while culture was positive in 85 cases. Dermatophytes accounted for 49

(57.6%) of total culture positive cases followed by non dermatophyte moulds 18 (21.3%), candida 15 (17.6%) and malassezia spp 3 (3.5 %). Non dermatophytes were isolated from cases of onychomycosis, tinea pedis and tinea capitis.

Among the Non dermatophytes, filamentous moulds were the most common i.e 18 (50 %) of which 15 (41.6%) were from cases of onychomycosis and 3(8.4%) from cases of *T. capitis*. Similarly Kumaran *et al.*, 2014 and Aruna vyas *et al.*, 2013, reported non dermatophyte moulds from cases of Onychomycosis and *T.capitis*. The *T.capitis* cases in which Non dermatophyte moulds were isolated were chronic cases and seen in adults. In these cases NDM s were seen in direct microscopy and were isolated in pure cultures. The pattern of isolations of non dermatophyte moulds include *Aspergillus* sps 9(50%), *Fusarium* Sps 2(11.1%), *Pencillium* sps including marnefi,

Paecilomyces, *Scopulariopsis*, *Alternaria* and *Acremonium* sps are 1(5.5%) each. *Aspergillus* sps were the majority. Only 1 isolate i.e *Alternaria* belonged to pheoid group. Out of 15 (17.6%) isolations of candida, 8(9.4%) are from cases of onychomycosis and 6 (7%) from *T. mannus*.

Candida were the second most common 15 (41.6%), 9(25%) are from cases of onychomycosis and 6 (16.6%) from *T. pedis*. *C.albicans* was the most common species isolated and was isolated in cases of Onychomycosis and *T.pedis*. Non albicans isolations were 4 (29.5) and were from Onychomycosis and *T.Pedis*. Speciation in chrome agar was done. The non albicans isolated were *C.parapsilosis* and *C.krusei*. All 3(8.4%) *Malassezia* spp were isolated from 7 cases presented as Pityriasis vesicolor.

Table.1 Pattern of Culture Isolates (n=85)

Sno	Fungal isolate	Number	%
1	Dermatophytes	49	57.6
2	Candida	15	17.6
3	Malassezia spp	3	3.5
4	Non dermatophyte moulds	18	21.3

Non dermatophytes were isolated from cases of onychomycosis, tinea pedis and tinea capitis

Table.2 Clinical Presentations and Non Dermatophytes Isolated (n=36)

S.No	Clinical presentation	Candida	Malassezia	Moulds
1	<i>Onychomycosis</i>	9(25%)	-	15(41.6%)
2	<i>Tinea capitis</i>	-	-	3(8.4%)
3	<i>Tinea pedis</i>	6(16.6%)	-	-
4	<i>Pityriasis versicolor</i>	-	3(8.4%)	-
Total		15(41.6%)	3(8.4%)	18(50%)

Table.3 Frequency of Non Dermatophyte Moulds Isolated (n=18)

Sno	Fungal isolate	Number	%
1	<i>Aspergillus niger</i>	2	11.1
2	<i>Aspergillus flavus</i>	4	22.2
3	<i>Aspergillus fumigates</i>	3	16.6
4	<i>Alternaria</i>	1	5.5
5	<i>Acremonium</i>	1	5.5
6	<i>Curvularia</i>	1	5.5
7	<i>Fusarium</i>	2	11.1
8	<i>Scopulariopsis</i>	1	5.5
9	<i>Paecilomyces</i>	1	5.5
10	<i>Penicillium marseffii</i>	1	5.5
11	<i>Penicillium</i>	1	5.5

Table.4 % of *Candida Albicans* and Non *Albicans* spp Isolated in Different Clinical Presentations (n=15)

Sno	Clinical presentation	<i>Candida albicans</i>	%	Non <i>albicans</i> spp	%
1	<i>Onychomycosis</i>	6	40	2	13.3
2	<i>T.pedis</i>	5	33.4	2	13.3
Total		11	73.4	4	26.6

Figure.1 LPCB Mount of *Scopulariopsis brevicaulis*

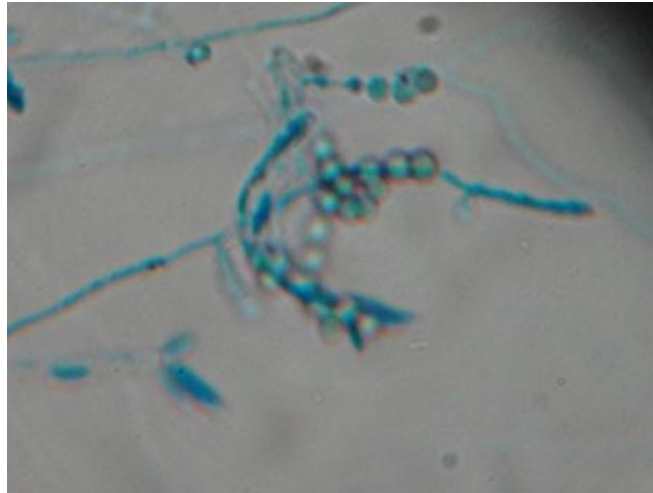


Figure.2 Finger Nail Onychomycosis



Figure.3 Chrome Agar Showing *Candida* Spp



Most of our isolates were from clinical presentations of Onychomycosis and *T.pedis*, in which the etiological agents can be dermatophytes or Non dermatophytes. So laboratory assistance to know the etiological agent is a must, especially in treatment of chronic cases in these clinical presentations. Also few isolations were non albicans candida, which makes yeast speciation must. In interdigitalis variant of *T.pedis* candida spp were isolated. This was mostly seen in women who were constantly exposed to wet environment.

There was increased number of non dermatophytes isolated in the present study this might be due to the commonest age group affected in onychomycosis was 51-60 yrs. The conditions favouring the growth of NDM were old nails, farmers, bad foot care and hot, humid climate as well(Kaur et al¹³). Though they are normally considered as contaminants they are capable of invading the nail as primary pathogens. Some studies have reported NDM in cutaneous mycosis, in the present study isolations were only in *T.Capitis* and onychomycosis. Their role in cutaneous mycosis is still not completely evaluated. So larger studies are very much needed for better understanding.

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How to cite this article:

Manjula, V., and Parameswari, K. 2016. A Study of Nondermatophytic Dermatomycosis in Patients Attending a Tertiary Care Hospital in Vijayawada, Andhra Pradesh, India. *Int.J.Curr.Microbiol.App.Sci*. 5(4): 452-458. doi: <http://dx.doi.org/10.20546/ijcmas.2016.504.053>