Research Paper

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To Study the Species Profile in Dermatomycoses Patients in a Tertiary Care Hospital of Western Maharashtra.

Medical Science

KEYWORDS : dermatomycoses, non-dermatophytes

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ABSTRACT

Objective- To isolate and identify species of causative fungi in cases of dermatomycosis.

Material and mathods-.. A total of 200 samples of skin, hair and nail were taken from patients clinically diagnosed as superficial mycoses.species identification was done using standard techniques. It is an observational study

Results- There were 200 clinically diagnosed cases of superficial mycoses .Out of 100 culture positive ,75 were dematophyte and 25 were non dermatophyte . The commonest species among dermatophytes being T. Rubrum (40%).The commonest species among non dermatophyte was C. albicans(40%) .

Conclusion- Our study emphasizes the need of knowing various fungal species causing superficial mycoses in an area so as to treat accordingly and to study the role of non dermatophytes along with dermatophytes in the pathogenesis of superficial mycoses and not merely discarding them as contaminants.

Introduction.

Infections caused by fungi are called mycoses. Fungal infections are very common in human beings. They are assuming greater significance both in developed and developing countries particularly due to advent of immunosuppressive drugs and diseases[1].

Superficial mycoses refers to fungal infections of the outermost layer of skin and its appendages like hair and nails. They are among the most prevalent of human infectious diseases.These infections are divided into two groups: the "Superficial mycoses", which includes *Pityriasis versicolor, Piedra* and *Tinea nigra* and the "Cutaneous mycoses" which includes Dermatophytoses and Candidiasis.[2]

Dermatomycoses which may include dermatophytoses along with any cutaneous manifestation of systemic mycoses i.e. infection by *Candida spp.* or colonisation by a variety of soil inhabiting organisms [3] , nondermatophytes rarely like *Trichosporon , Malessezia, Hortae wernickee* .[4] and filamentous moulds like *Scopulariopsis, Alternaria, Aspergillus , Fusarium* etc.[5].

According to the World Health Organization (WHO) high prevalence of nondermatophytic mold onychomycoses has been reported from India (22%) [6]. Generally, these fungi exhibit a cosmopolitan profile, that is, they are found in different regions of the world with variations in the frequency, as climatic factors, social practices, migration and individual characteristics like nutrition ,hygienic habits and individual susceptibility may influence the epidemiology of dermatomyoses[7,]. Although dermatophytoses does not produce mortality, it does cause morbidity and poses a major public health problem, especially in tropical countries like India due to the hot and humid climate.[3] Over the last decades, an increasing number of non dermatophyte filamentous fungi have been recognized as agents of skin and nail infections in humans, producing lesions clinically similar to those caused by dermatophytes.[8,]. Though commonly considered as contaminants, they have been reported to colonize damaged tissues and cause secondary tissue destruction[9,].

Present study was undertaken with the view to find out the species profile of superficial mycoses and species of dermatophyte and nondermatophyte prevalent in patients attending skin OPD with complaints of superficial mycoses,in a tertiary care rural hospital.

Material and Methods-The study was conducted from January 2013 to June 2014 for a period of one and a half year on the patients attending OPD of Skin and Venereology department for various dermatological complaints. It is an observational study.

A total of 200 sample of skin, hair and nail were taken from patients clinically diagnosed as superficial mycoses. Before collecting the sample relevant history was taken. The lesion area was cleaned with 70% alcohol before sampling to remove contaminants such as bacteria. The following materials were used for isolation of dermatophytes and non dermatophytes: skin, nail and hair.

Portion of the specimen was examined microscopically using 10% potassium hydroxide (KOH) with 40% dimethyl sulfoxide. Culture methods were used in which various combinations of SDA with or without cycloheximide and chloremphenicol at various temp. were used for isolation of dermatophytic and non dermatophytic moulds and yeasts.

Repeat subculture for aspergillus to decide whether a contaminant or isolate. for candida for species differentiation cornmeal agar and hychrome candida chromogenic agar were used. For malessezia modified Dixon agar was used.

Species identification- from culture done by slide culture arrangement and lactophenol cotton blue mount. Other tests done were India ink wet preparation,germ tube test, sugar assimilation and sugar fermentation.

RESULTS-

200 samples were taken from clinically diagnosed cases of superficial mycoses attending Skin OPD, of which,skin samples were 145,hair were 36 and nail were 19.

Out of 200 cases,Male being 138(69%) and female being 62(31%).

Table 1 – Distribution of dermatophytes and non dermatophytes according to culture positivity.

Total culture positive(No. and %)	No.of positive patients for dermatophytes (No. and %)	No.of positive patients for non-dermatophytes (No. and %)
100	75	25

This table shows that culture positivity of dermatophytes(75%) and non dermatophytes(25%). 4 cases of Aspergillus on first inoculation ,were discarded as contaminant , as none were positive for Aspergillus on repeated inoculation from the same site of the patient .

Table -2 : Species of dermatophytes isolated from different clinical types

	T. corporis	T. cruris	T. barbae	T. capitis	T. pedis	T. Manuum	T. unguim	Total
T.rubrum	12	11	00	00	04	00	03	30(40%)
T.mentagrophyte	10	12	04	00	00	00	01	27(36%)
T.violaecium	01	00	00	05	00	00	00	6(8%)
E.floccosum	06	02	00	00	00	00	00	8(10.66%)
M.gypseum	02	00	00	00	00	00	00	2(2.67%)
M.nanum	01	01	00	00	00	00	00	2(2.67%)
Total	32	26	04	05	04	00	04	75(100%)

T(top to bottom)=trichophyton

T(left to right)=Tinea.

This table shows that most common species isolated is T.rubrum(40%) followed by T. mentagrophyte(36%) among dermatophytes.T.rubrum was common in Tineacorporis and T. mentagrophyte was common in Tineacruris.T.violaceum is isolated from 100% (5/5)culture positive T.capitis and all are isolated from 0-10 yrs age group.

Table -3: Species of non dermatophytes isolated from clinically diagnosed superficial mycoses.

Isolates	T.corporis	T.cruris	T.barbae	T.capitis	T.pedis	T.mannum	T.unguim	Pityriasis versicolor	Total
C.albicans	0	0	0	0	6	2	2	0	10(40%)
C.parapsilosis	0	0	0	0	0	0	2	0	2(8%)
C.tropicalis	0	0	0	0	3	2	2	0	7(28%)
C.krusei	0	0	0	0	1	0	0	0	1(4%)
Fusarium	0	0	0	0	0	0	2	0	2(8%)
Trichosporon Asahii	0	0	0	0	0	0	3	0	3(12%)
Malassezia	0	0	0	0	0	0	0	0	0(0%)
Total	0(0%)	0(0%)	0(0%)	0(0%)	10(40%)	4(16%)	11(44%)	0	25(100%)

T=Tinea ,This table depicts most common clinical site affected by candida spp.was Tinea unguim(44%).Most common specie isolated was C.albicans(40%) among non dermatophytes.

Table -4 : Species of non dermatophytes according to site of infection.

Isolates	Skin	Nail	Total
C.albicans	08(57.14%)	02(18.18%)	10(40%)
C.tropicalis	05(35.71%)	02(18.18%)	07(28%)
C.parapsilosis	00(0%)	02(18.18%)	02(8%)
C.krusei	01(7.14%)	-	01(4%)
Trichosporonasahii	-	03(27.27%)	03(12%)
Fusarium species	-	02(18.18%)	02(8%)
Total	14	11	25

This table depicts that among nondermatophytes ,the most common species isolated is C.albicans(40%) and most common site affected by non dermatophytes is skin(57.14%)

DISCUSSSION:

In Table 1: Among total positive 100 isolates ,75% were dermatophytes and 25% were non dermatophytes which was in accordance with (PradeepNawal et al 2012)[2] in which dermatophytes were 68.4% and non dermatophytes 31.6% ,(Parul Patel et al 2010) [6,]found dermatophytes to be 66.66% and non dermatophytes to be 33.34% respectively.

As mentioned in Table 2: the most common species isolated was *Trichophyton rubrum*(40%) followed by *Trichophyton mentagrophyte*(36%),3 rd most common being *E.floccosum*(10.66%) and 4th most common being *Trichophyton violaceum*(8%) among dermatophytes which was similar to the study of(Kamothi, M. N et al 2010)[10] in which *Trichophyton rubrum* was 75.25%, *Trichophyton mentagrophyte* was 13.40%, *E. Floccosum* was 8.24% and *Trichophyton violaceum* was 2.06% respectively. .Whereas in a study by (AnupKainthola et al 2014)[11] *Trichophyton mentagrophyte* was most common(42.85%) , followed by*Trichophyton rubrum*(28.15%),3rd most common being *E.floccosum*(18.92%) and no *Trichophyton violaceum* among dermatophytes which can be explained by geographical variation and individual susceptibility to species.

Trichophyton rubrum was most commonly isolated from Tinea corporis.(40%) of all clinical sites similar to study by(A.Aggarwal 2002)[12,] in which it was isolated from 40.14% cases. *Trichophyton mentagrophyte*(46.15%) was more commonly isolated from Tinea cruris as compared to *Trichophyton rubrum*(42.30%) which is similar to study of(Parul Patel et al 2010) [8]in which *Trichophyton mentagrophytes*(60%) was most commonly associated with Tinea cruris as compared to *Trichophyton rubrum.*(20%).

In present study, *M.gypseum* was 2.67% of all dermatophytes(100%) of*M.gypseum* were isolated from Tinea corporis site.In a similar study by(Vikeshkumar Bhatia et al 2014) [13,] *M.gypseum* was 1.35% of all dermatophytes and 100% of it was isolated from Tinea corporis. Tinea corporis.Isolation of *M. gypseum* is of special interest as this species is generally less encountered in India.(Suruchi Bhagra et al 2014)[14]

M. nanum was 2.67% of all dermatophytes in present study and it was found in 50% of Tinea corporis and 50% of Tinea cruris. According to study conducted by (N Sivakumar et al 2008)[15], it was2.723% of all dermatophytes but it was isolated from Tinea unguim.

E. floccosum in present study was 10.66% of all dermatophytes.75% of *E.floccosum* was isolated from Tinea corporis and 25% from Tinea cruris.In the study of(Sweta R Prabhu et al 2013) [16] 29.41%of all dermatophytes was *E.floccosum* and 70% of *E.floccosum* was isolated from Tinea cruris and 20% of *E.*

*floccosum*was isolated from Tinea corporis.

According to Table 3: In the present study the most common clinical site from where non dermatophytes were isolated was Tinea unguim(44%) followed by Tinea pedis(40%) and Tinea nanum(16%).Most common species isolated was *C.albicans*(40%) among non dermatophytes as patients after immersing their hand and feet in water do not tend to dry it and interdigital spaces remain moist for long time.

Table 4: depicts that in the present study among non dermatophytes ,the most common species isolated was *C. albicans*(40%) and most common site affected by *C. albicans* was skin(60%) .Similarly in a study by(Sweta R Prabhu et al 2013) ([16],) *C.albicans* (50%) was the most common species isolated among non dermatophytes and skin affected was(66.66%).

In the present study, among *Candida* , *C. albicans*(50%) was most common ,then second most common was*C. Tropicalis*(35%) followed by *C. Parapsilosis*(20%) and *C.krusei*(5%).*Fusarium* species was (8%) of total non dermatophytes .According to study of(Nidhi Prasad et al 2013)[(22)],amongst *Candida* spp. *C. tropicalis*(i.e. 66.66%) was the most commonly isolated species followed by *C. albicans*(i.e.33.33%).

In the present study , most common site affected by *C.albicans* was skin(60%).Similarly in a study by(Sweta R Prabhu et al 2013) ([16]) *C.albicans* (50%) was the most common species isolated among non dermatophytes and skin affected was(66.66%)..

In the present study , most common site affected by *C. parapsilosis* was nail(100%).According to(Tasić S et al 2001)[(17)]the main yeasts causing nail infections were *C.parapsilosis*, and *C.guilliermondii*;. *C. albicans* was only in third place

The site affected by *C. tropicalis* was skin (71.42%)andnail(28.58%).According to(Johan A et al)[(18)] *C.albicans* and *C. tropicalis* are the most common species associated with cutaneous candidiasis and onychomycoses.

In the present study , *Fusarium* was(8%) of total non dermatophytes, 100% of it affecting nail ,all 2 samples were from immunocompetent patients. According to the study of (A.Aggarwal 2002)[(19)],*Fusarium* was(17.64%) of total non dermatophytes of which 25% affected nail.But according to (PradeepNawal et al 2012)[(2)]*Fusarium* species were 14.3% of all non dermatophytes. According to (MarcioNucciet al 2007)[(20)]specific identification of *Fusarium* species requires molecular methods so the precise identification of species was not possible. According to (Thomas S Kuruvilla et al)[(21)]Fusarial onychomycoses is seen as white superficial lesions in immunocompetent patients, with these lesions presenting as only a cosmetic effect requiring long-term treatment but in immunocompromised patients they can cause disseminated infections with poor response to antifungals.

In the present study,*Trichosporon asahii* affected(15.79%)of total nail samples.In a study by (Noha El-Mashad et al 2011) [(22).]*Trichosporon asahii* was isolated from 4.68% of nail scrapings.

In the present study all the three *Trichosporon asahii* caused onchomycoses and all the samples were from immunocompetent patients. According to (Sageerabanooet al 2011)[(23)]*Trichosporon asahii* is the most common species causing human infections. It is known to cause white piedra and less commonly onychomycoses in an immunocompetent host.

The rate of isolation of different species varies in different set up because of-1)Geographical variation,2)sample size,3)Various treatment taken by the patient before coming to OPD.

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