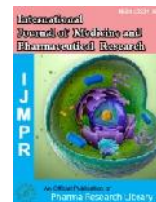




International Journal of Medicine and Pharmaceutical Research

Journal Home Page: www.pharmaresearchlibrary.com/ijmpr



Research Article

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A Study of Superficial Mycosis in Patients Attending a Tertiary Care Hospital in Vijayawada, Andhra Pradesh, India.

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ABSTRACT

The present study was done to know the profile of etiological agents causing superficial mycosis, in patients attending the skin Department of our hospital. 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) among which *Trichophyton rubrum* was the most common (21 isolates). Non dermatophytes isolated include non dermatophyte moulds (21.3%), candida sps (17.6%) and malassezia sps (3.5%). It was concluded that along dermatophytes, non dermatophyte fungi are also emerging as important causes of superficial mycosis.

Keywords: Superficial mycosis, Dermatophytes, *Trichophyton rubrum*, *Tinea corporis*.

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Article History: Received 12 June 2015, Accepted 18 July 2015, Available Online 10 August 2015

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Manuscript ID: IJMPR2623



PAPER-QR CODE

Citation: Dr. V. Manjula and Dr. K. Parameswari. A Study of Superficial Mycosis in Patients Attending a Tertiary Care Hospital in Vijayawada, Andhra Pradesh, India. *Int. J. Med. Pharm. Res.*, 2015, 3(4): 1100-1104.

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1. Introduction

Superficial mycosis is the superficial fungal infection of skin and its appendages affecting millions of people worldwide.¹ It is most commonly caused by dermatophytes and some due to yeasts and other non dermatophytic fungi. [2]. Dermatophytes are keratinophilic hyaline septate fungi and infection due to dermatophytes (Dermatophytosis) is generally limited to non living keratinized layers of skin, hair and nails [3]. Hot and humid climate in tropical and subtropical countries like India makes dermatophytoses a very common superficial fungal infection. Although this condition doesn't cause mortality, it causes morbidity and poses a major public health problem and also is of cosmetic importance. [1]

Non dermatophytes include yeasts (candida, malassezia) and moulds. They have been reported to colonize damaged tissue and cause secondary tissue destruction [4]. Their role in causing superficial infections have been well documented in many studies. Treatment of non dermatophyte infections is often difficult as topical and systemic antifungal are ineffective [5]. 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. [6,7]

The importance of identifying fungi causing superficial mycosis is very much essential to find out probable source of infection, treatment and to exclude other skin disorders which mimic superficial fungal infections making laboratory diagnosis necessary. As there are no recent studies on superficial mycosis in this area, the present study was chosen to perform among patients attending outpatient section of Department of Dermatology, venerology and Leprosy, Government General Hospital, Vijayawada.

2. Materials and Methods

This is a prospective study, was conducted from August, 2013 to 2014 at one of the teaching hospital, which is also a tertiary care hospital in Vijayawada, Andhra Pradesh. A total of 150 cases attending the dermatology O.P were taken as study group. 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 or without cycloheximide. Dermatophyte test medium is also used. 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. The

culture studies and identification were done by standard methods.

3. Results and Discussion

Results:

A total of 150 clinically suspected cases were enrolled in the study comprising 98(65.3%) males and 52(34.7%) females. None of them had any systemic disease. 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 followed by 30 (20%) in 21-30 yrs, 25 (16.6%) in 11-20 years , 24 (16%) in 41-50 yrs, 18 (11.9%) in 51-60 yrs, 11 (7.3%) in 0-10 yrs and lastly 10 (6.6%) were in the age group above 60. There was male preponderance to females in all the age groups. (Table 1)



Figure 1: Extensive tinea corporis in a diabetic



Figure 2: Finger nail onychomycosis



Figure 3: Tinea faciei

The most common clinical presentation is tinea corporis i.e. 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 manuum 4 each (2.6%) and pityriasis versicolor 7(4.6%).

Categorisation of the cases by socio-economic status revealed that Superficial mycosis was more common in people of low-socio economic status 72(48%) followed by middle socio- economic status 47(31.3%) and high socio-economic status 31(20.7%). Of the 150 cases, 54(36%) are occupations associated with increased physical activity followed by other occupations 53(35.4%) and occupations associated with wet work 43(28.6%).

Total KOH/Culture positive cases were 111(74%). KOH & Culture positive cases were 81(54%). KOH positive and culture negative cases were 26(17.3%). KOH negative and culture positive cases were 4(2.6%). KOH negative cases and culture negative cases were 39.(26%). The different dermatophytes isolated in the study include *T.rubrum* 21 (42.8%) followed by *T.mentagrophytes* 11 (22.5%), *T.tonsurans* 6 (12.2%) *T.violaceum* 4 (8.1%), *M.audouini* 4 (8.2%) and finally *E.floccosum* in 3 (6.1%). Non dermatophytes isolated were non dermatophyte moulds and candida sps, these were isolated from cases of onychomycosis, tinea pedis and tinea capitis.

The Non dermatophyte mould isolations include highest of *Aspergillus* sp i.e 9 in number which includes *A. niger* 2(11.1%), *A.flavus* 4(22.2%) and *A .fumigatus* 3(16.6%). The other isolates are *Fusarium* 2 (11.1%), *Paecilomyces* and *Penicillium marneffi*, *Alternaria*, *Acremonium*, *Curvularia*, *Scopulariopsis*, *Penicillium*, *Rhizopus* 1 (5.5%) isolate each respectively. The candida isolations in the study include 15 (70.5%) belong to *C.albicans* in which 6 (41.1%) were isolated in cases of Onychomycosis and 5 (29.4%) in *T.pedis*. Similarly Non albicans isolations were total 4 (29.5) in which 2(%) were from Onychomycosis and 2(%) from cases of *T.Pedis*. Speciation in chrome agar was done. The non albicans isolated were *C.parapsilosis* and *C.krusei*.

Discussion:

The present study was done with intention to know the profile of etiological agents causing superficial mycosis. The sample in the study comprises 150 subjects, of which 98 (65.3%) were males and 52 (34.7%) were females with a male to female ratio of 1.8:1 [8,9,10,11, 12]. This finding correlates well with majority of the studies across India. 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. Environmental conditions such as hot and humid weather, poor personal hygiene and illiteracy are common factors for both males and females .Persons of all ages were susceptible but most of the cases of fungal infection i.e, 32 (21.3%) patients belonged to 31-40 year age group followed by, 30 (20%) in 21-30 yrs. Similar observations

were seen in studies of Kennedy Kumar et al [16] and Amita Pandey et al [17]. The probable reason for this age predilection is excessive sweating due to excessive physical activity, as a consequence, in addition the tropical climatic conditions. In the present study tinea corporis was the commonest clinical type encountered i.e. 30%. Tinea corporis is the most common clinical presentation in many studies across India [8,9,10,11,12].

Onychomycosis (25.3%) was the second most common clinical presentation in the present study. This is due to onychomycosis is refractory to treatment and relapses are common, resulting in increased attendance to the tertiary level Hospital for expert treatment. The most common age group affected was 51-60. The likely reason is onychomycosis is more frequent in elderly [21] due to reduced growth rate of the ungual plate, an increased wear and tear, poor peripheral circulation, metabolic conditions like diabetes and inability to maintain good foot care [22]. Pityriasis versicolor was seen only in 7 cases (4.6%) in the present study.

People of low-socio economic status 72(48%) were the most affected followed by middle socio- economic status 47(31.3%) and high socio-economic status 31(20.7%). The risk factors include increased exposure to environment due to their occupation, influence of the typical tropical climate, personal hygiene and habits of people. Similar observations were noted in studies of Smita sarma et al [8], S Sahai [10] et al, Vikesh Kumar Bhatiya [18] et al. 54 (36%) were occupations associated with increased physical activity followed by other occupations 53(35.4%) and occupations associated with wet work were 43 (28.6%). Occupations like farming, increased exposure to water, living in overcrowded conditions, sharing of articles, trauma to superficial structures, social habits play an important role in etiology of Superficial mycosis (particularly Onychomycosis). In the present study manual labourers and farmers were affected. Similar observations were noted in the studies of Mudita Gupta [23] et al, Smita sarma [8] et al, Veer P [24] et al, Sumana V [25] et al. This could be due to Labourers have high perspiration due to greater physical activity and also there is a risk occupation related trauma. Total KOH/Culture positive cases were 111 (74%). KOH & Culture positive cases were 81(54%). KOH positive and culture negative cases were 26(17.3%). KOH negative and culture positive cases were 4(2.6%). KOH negative cases and culture negative cases were 39.(26%) The culture isolates obtained in the study as per table no 3 includes highest no of dermatophytes i.e 49 (57.6%) followed by Non dermatophytes which include moulds 18 (21.3%), *Candida* 15 (17.6%) and *Malassezia* spp 3 (3.5 %) making a total of 85. This shows superficial fungal infections can be caused by both dermatophyte and non dermatophyte fungi. These findings are comparable with other studies [9,10,11,16,17,26,27]. Among the dermatophytes *T.rubrum* was found to be common in most of clinical isolations in the study with a total of 21 isolates followed by *T mentagrophytes* 11 isolates. Most of the isolates are from cases of *T.corporis* and Onychomycosis followed by other

conditions. Other infrequent isolates include *M.audouini* (4) in cases of *T.corporis*, *T.cruis* and *T.capitis* and *T.violaceum* (4 isolates) was found in *T.capitis* and *T.faciei*. The non dermatophytes isolated were non dermatophyte moulds and candida spp. Similar findings were seen in other studies [9,10,11,16,17,26,27]. These were isolated from cases of onychomycosis, tinea capitis and tinea pedis. Non dermatophyte moulds are the most commonly isolated pathogens i.e 18(21.1%) of which 15 (17.6%) were from cases of onychomycosis and 3(3.5%) from cases of *T. capitis*. Similar pattern of Non dermatophyte moulds were seen in other studies [11,13,19,23,27]. 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. Similarly out of 15 (17.6%) isolations of candida, 8(9.4%) are from cases of onychomycosis and 7(7%) from *T. pedis*. All 3(3.5%) *Malassezia* spp were isolated from 7(8.2%) cases

presented as Pityriasis versicolor. Most of the non dermatophyte isolates were from clinical presentations of Onychomycosis and *T.pedis*. 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 [22] et al). All the Non dermatophyte moulds isolated in the present study were KOH positive and were repeatedly isolated in the same specimen. Their role in cutaneous mycosis is still not completely evaluated. So larger studies are very much needed for better understanding.

Table 1: Age and Sex wise distribution (n=150)

S.No	Age group	Males	%	Females	%	Total	%
1	0-10	6	4	5	3.3	11	7.3
2	11-20	13	8.6	12	8	25	16.6
3	21-30	18	12	12	8	30	20
4	31-40	24	16	8	5.3	32	21.3
5	41-50	12	8	12	8	24	16
6	51-60	14	9.3	4	2.6	18	11.9
7	>61	8	5.3	2	1.3	10	6.6
Total		98	65.3	52	34.7	150	100

Table 2: Direct microscopy vs Culture isolates (n=150)

	Culture Positive	Culture Negative	Total
KOH positive	81	26	107
KOH Negative	4	39	43
Total	85	65	150

Table 3: Pattern of Culture Isolates (n=85)

S.No	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

4. Conclusion

Since many clinical conditions mimic dermatophytosis, the non dermatophyte isolations also have to be investigated as etiological agent by repeating the culture. Non dermatophytic fungi has a definite role in causing superficial mycosis in some clinical conditions as proved in this study. With increase in reporting of immune compromised conditions and metabolic diseases, all opportunistic fungal isolations have to be evaluated for its causative role in disease before discarding as contaminants. A larger sample makes similar studies more informative. Microbiologist with basic laboratory facility as

proved in the present study has a major role to play, to make further in roads in this challenging field.

5. Acknowledgement

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