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ORIGINAL ARTICLE

Determination of the incidence of dermatomycoses with prevalent causative agents in various age groups

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ABSTRACT:

Introduction: The present study was undertaken to determine the incidence of dermatomycoses in various age groups and to find out common clinical types prevalent in this area we also find out prevalent causative agents responsible for these clinical types. **Materials and Methods:** The presence or absence of any type of fungal elements like hyphae, arthrospores or budding yeast cells was recorded. Material was inoculated on Sabouraud's dextrose agar with chloramphenicol & actidione and Dermatophyte Test Medium. Samples were inoculated in two sets of these culture media. One set was incubated at 37ºC and another set at 25ºC in BOD incubator. **Results:** clinical analysis of 220 cases of dermatomycoses. It is observed that Tinea corporis is major clinical type accounting for 24% cases. Mixed infections were seen in two cases (1.8%). It includes cases of T.pedis with T.mannum and T. corporis with T.cruris. **Conclusion:** KOH examination is simple, easier, cost-effective and more sensitive technique for diagnosis of dermatomycoses compared to culture. DTM is a good screening medium in laboratory diagnosis of dermatophytosis compared to SDA with actidione.

Keywords: dermatomycoses, causative agents, Determination

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INTRODUCTION

It is more prevalent in tropical and subtropical countries including India, where heat and moisture play an important role.[1]

Dermatophytosis is mainly confined to the keratinized layers because its fungal agents are not able to penetrate into the organ or deeper tissue of healthy individuals. However, these kind's infections are also dependent on the immune status of the host, fungal agent and site of infection. Superficial mycoses can easily spread through fomites or direct contact with the infected humans and animals. Although the infection is curable and non- invasive, its widespread nature and therapeutic costs are major worldwide public health problems. The clinical lesions of superficial mycosis are highly variable and closely resemble other skin diseases. Therefore, it is important to have a confirmed laboratory diagnosis of superficial mycosis due to fungal agents.[1,2]

Although not life threatening, its severity can cause great discomfort particularly in immunosuppressive conditions. It remainsa general public health problem, which is prevalent in all age groups and both the sexes.[2] Clinical lesions caused by the fungi are highly variable and closely resemble other skin diseases making laboratory diagnosis and confirmation necessary.[3] The diagnostic tests include potassium hydroxide (KOH) wet mount examination, wood's lamp examination, skin biopsy and fungal culture.[4] The identification of the causative agent is necessary particularly in the case of tinea capitis which provides information on the risk of spread to other children at home or in the school.[5]

The present study is aimed to study various clinical presentations, mycological identification of dermatophytes and correlation between the site of involvement and causative agent.

MATERIAL & METHODS

A total of 220 patients suspected to be suffering from dermatomycoses were selected for the study. Detail history of patients was taken and information about age, sex, occupation of the patient & duration of illness was recorded. A clinical examination of patient was carried out to see size, shape & distribution of lesion.

The lesions were cleaned with 70 percent alcohol thoroughly and allowed to dry. Scrapings from active margin of the lesions were collected on clean, sterile white paper envelope or petridishes with help of sterile scalpel. In case of Tinea pedis, white macerated skin from interdigital space was removed, discarded and scrapings were collected. In case of infected nails, superficial layers of nails were removed and then material was collected. In case of Tinea capitis, hairs were plucked with the help of sterile forceps in addition to scrapings from lesions. The hairs were cut into pieces before inoculating into the culture media.

In laboratory, wet preparations were made in 10 percent KOH on slide, and covered with cover slip.

Preparations were kept for 30 – 60 minutes or passed in flame of burner 2 to 3 times to enhance digestion of keratin. Nails were treated for longer duration of time (3-4 hours) and then examined under microscope. The presence or absence of any type of fungal elements like hyphae, arthrospores or budding yeast cells was recorded. Material was inoculated on Sabouraud's dextrose agar with chloramphenicol & actidione and Dermatophyte Test Medium. Samples were inoculated in two sets of these culture media. One set was incubated at 37°C and another set at 25°C in BOD incubator.

RESULTS

Table 1 shows clinical analysis of 220 cases of dermatomycoses. It is observed that Tinea corporis is major clinical type accounting for 24% cases. Mixed infections were seen in two cases (1.8%). It includes cases of T.pedis with T.mannum and T. corporis with T.cruris.

Table 1: Clinical analysis of cases of dermatomycoses

Sr. No.	Clinical types	Number of cases	Percentage (%)
1	Tinea corporis	53	24
2	Tinea capitis	42	19
3	Tinea cruris	30	13.6
4	Tinea pedis	24	10.9
5	Tinea versicolor	24	10.9
6	Tinea unguium	23	10.4
7	Tinea mannum	14	6.3
8	Tinea barbae	6	2.7
9	Mixed infection	4	1.8
		220	100

Table 2 shows age wise distribution of clinical types of dermatomycoses. Maximum incidence was seen in second decade of life. i.e. 11-20 years. Male: Female ratio was 1.67:1. In most of studies maximum age incidence was 21- 30 years. In our study it was found in 11-20 years. Probable reason for this will be high number of cases of tinea capitis in our study compared to other studies in which tinea corporis and cruris are predominant clinical types. Inclusion of cases of tinea versicolor in our study also contributes to high incidence in 11-20 years.

Table 2: Age and Sex wise distribution of cases of dermatomycoses

Clinical types	10 Yrs		-20 Yrs		-30 Yrs		-40 Yrs		-50 Yrs		onwards	
	M	F	M	F	M	F	M	F	M	F	M	F
corporis	4	3	8	1	10	5	12	8	3	2	3	0
capitis	13	16	3	9	1	0	0	0	0	0	0	0
cruris	1	0	9	0	3	0	9	0	5	0	4	0
pedis	0	0	4	4	3	2	5	0	0	5	1	0
versicolor	0	1	9	4	7	1	1	0	0	0	0	0
unguium	2	1	0	2	3	2	1	2	5	1	2	2
mannum	0	0	0	0	1	2	0	3	1	4	0	1
barbae	0	0	1	0	0	0	3	0	0	0	0	0
ixed infection	0	0	0	0	1	1	0	0	0	0	0	0
otal	20	21	34	20	29	13	31	13	14	12	10	3
	41		54		42		44		26		13	
ercentage	48.7	51.2	62.9	37.0	69.0	30.9	70.4	29.5	53.8	46.1	79.9	23.0
	18.6		24.5		19.0		20.0		11.8		5.9	

Out of 27 cases of T. versicolor, 25 cases were positive in microscopy (91.3%). Microscopy was positive in 165 cases (75%), while culture was positive in 84 cases (44.6%) only.

Table 3: KOH & Culture positivity

vestigation	Total	Percentage
OH +	165 (220)	75
ulture +	84 (188)	44.6

There was no evidence of fungus either by microscopy or culture in 43 cases (23%). 8 cases, which were negativein microscopy found culture positive.

Table 4: Relation between clinical types and mycological investigations

Sr. no.	Clinical types	No. of cases	KOH+ve ulture+ve	KOH+ve ulture-ve	KOH-ve ulture+ve	KOH-ve ulture-ve
	nea corporis	51	18	23	0	12
	nea capitis	40	20	10	3	10
	nea cruris	29	11	14	0	6
	nea pedis	23	14	5	1	5
	nea unguium	22	4	11	1	8
	nea mannum	13	3	6	1	5
	nea barbae	5	3	0	0	3
	ixed infection	3	3	0	0	0
	otal	80	70	65	8	43
	ercentage		39.3	36.2	4.1	24.2

T. mentagrophyte (44.0%) was found to be the most (common) prevalent species, followed closely by *T. rubrum* (41.6%). There was no isolate of genus *Microsporum* or *Epidermophyton* in present study.

Table 5: Types of fungi isolated

Types of fungi	Numbers	Percentage
T.mentagrophyte	37	44.0
T.rubrum	35	41.6
T.violaceum	5	5.9
T.tonsurans	4	4.7
C.albicans	3	3.5
Total	84	100

All culture positive isolates grow both on SDA with actidione & DTM on primary isolation. On DTM, first appearance of growth was within 10 days of inoculation for most of specimens, that is 84.2 %. But, the appearance of growth was only after 10 days for 79.4 % of specimens when grown on SDA with actidione.

Table 6: Comparison of rate of growth on SDA and DTM

vestigation	A –Growth after0 days	TM- Growth before 10 days
Number of cultures	63	67
Percentage	79.4	84.2

DISCUSSION

It is followed by T.capitis – 19.5%, T.cruris –14%, T.pedis-11%, T.versicolor-11%, T.unguium-10.5%. Other clinical types were T.mannum (6 %) & T.barbae (3 %). The incidence of various clinical types varies from one geographical place to another. T.corporis was commonest clinical presentation in studies of Mankodi et al,[6] Amin et al[7] & Shah et al[8] carried out in this area as well in other studies outside like Vijaykumar et al[9] & Nita Patwardhan et al.[10]

Regarding incidence of age (Table - 2) most of cases of dermatomycoses were seen in age group 11-40 years. It is also common in the first decade of life in our study. Greater number of cases noted during first decade of life was due to very high number of cases of T. capitis otherwise skin infection during 1st decade of life is rare. The infection was more prevalent in males (62.5 %) than females. High incidence in young adults & adolescents and male predominance was seen in most of studies carried out in India like Pankajlaxmi et al,[11] Khalidque et al,[12] Poria et al[13] & others[14,15.]

Out of 220 cases, 167 cases were identified as positive either by culture or KOH examination. Cultures were positive only in 42.8 % cases & KOH examination was positive in 76.5 % cases.

Out of 200 cases, 157 cases were identified as positive either by culture or KOH examination. Cultures were positive only in 41.6 % cases & KOH examination was positive in 75.2 % cases. Low positivity in culture in our study was due to i) contamination and ii) inclusion of partially treated cases by antifungal agents. Similar results were also observed in studies of Mankodi et al,[6] Vijaykumar et al[9] & Singh et al.[16]

T. mentagrophyte (47.3%) was found to be the most common etiological agent followed closely by *T. rubrum* (44.6%).The other isolated species are -*T. violaceum* (4%), *T. tonsurans* (2.7%) & *C. albicans* (1.4%). *T.mentagrophyte* & *T.rubrum* are most common etiological agents reported from all over India in various studies. In studies of Parimal Prasad et al,[17] Sundaram et al[18], Behl & Sharma et[19] al, *T.mentagrophyte* was the commonest fungus isolated. *T.rubrum* was commonest isolated species in this area in previous studies.

CONCLUSION

The present study showed no significant difference in incidence, age & sex distribution pattern & clinical types compared to previous studies done in same geographical area. However, a change in demographic

pattern in isolation of fungi observed with *Trichophyton mentagrophyte* being commonest isolate in comparison with previous studies carried out in this area.

KOH examination is simple, easier, cost-effective and more sensitive technique for diagnosis of dermatomycoses compared to culture. DTM is a good screening medium in laboratory diagnosis of dermatophytosis compared to SDA with actidione. However, for species identification

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