A study of 200 cases of dermatomycoses in Ahmedabad, Gujarat

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ABSTRACT

Background & Objective: *Dermatophytic infections are commonly encountered problem and constitute more than 50 % of cases in dermatology outpatient departments. Dermatomycoses is seen all over the world both in urban and rural areas. Ahmedabad is a tropical area for the development of dermatomycoses. We found lot of cases post-monsoon due to favorable climatic condition of hot & humid atmosphere for the development of fungal infections. Last study carried out was by Shah & Amin et al in 1975. As there was no scientific data available since last 40 years, present study was carried out to see & compare changes in incidence, clinical presentation and etiological agents.*

Material & Methods: *200 clinically suspected cases of dermatomycoses were examined and subjected to mycological study by KOH & culture on SDA with actidione and DTM.*

Result & Interpretation: *Tinea corporis was the commonest clinical presentation. Maximum incidence was seen in young adults & adolescents in age group of 11-40 years. Males were more affected compared to females. KOH examination & culture were positive in 75.5 % & 41.6 % of cases respectively. Trichophyton mentagrophyte (47.3 %) was commonest fungal isolate followed by Trichophyton rubrum (44.6 %). Trichophyton violaceum was isolated from cases of tinea capitis only. All culture positive isolates grow on both SDA & DTM. Appearance of growth was faster in DTM compared to SDA with actidione.*

Key words: *Dermatomycoses, Trichophyton mentagrophyte, Trichophyton rubrum, SDA-Sabouraud's Dextrose Agar, DTM-Dermatophyte Test Medium*

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INTRODUCTION

The dermatomycoses is a common clinical condition distributed worldwide.

The prevalence of this condition depends on variety of factors and varies in difference parts of our country. As there was no scientific study carried out since last 45 years in this area, the present study was undertaken with following aims and objectives:

- To determine the incidence of dermatomycoses in various age groups
- To find out common clinical types prevalent in this area
- To find out prevalent causative agents responsible for these clinical types
- To correlate sites of involvement and etiological agents
- To compare this data with similar studies carried out in this geographical area previously

MATERIAL & METHODS

The material for study of dermatomycoses was collected from patients attending outpatient department of Dermatology, L.G. Hospital, Ahmedabad. A total of 200 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 37ºC and another set at 25ºC in BOD incubator.

The cultures were regularly observed for growth of fungi. Those cultures which did not show any growth even after four weeks were considered negative and discarded. Positive cultures were identified by rate of growth, colony characters, pigment on reverse of colony and microscopic examination of growth in lactophenol cotton blue stain for size and shape of conidia. Slide cultures were done to confirm the species.

To differentiate *T. rubrum* from *T. mentagrophyte*, urease test & hair perforation tests were carried out. Diagnosis of Tinea versicolor was done on the basis of microscopy (presence of short hyphae and clusters of round yeast cells – spaghetti and meat ball appearance) alone.

Findings

Table 1: Clinical analysis of cases of dermatomycoses

Sr. No.	Clinical types	Number of cases	Percentage (%)
1	Tinea corporis	50	25
2	Tinea capitis	39	19.5
3	Tinea cruris	28	14
4	Tinea pedis	22	11
5	Tinea versicolor	22	11
6	Tinea unguium	21	10.5
7	Tinea mannum	12	6
8	Tinea barbae	4	2
9	Mixed infection	2	1
		200	100

Table - 1 shows clinical analysis of 200 cases of dermatomycoses. It is observed that Tinea corporis is major clinical type accounting for 25% cases. Mixed infections were seen in two cases (1%). It includes cases of T.pedis with T.mannum and T. corporis with T.cruris.

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

Clinical types	0-10 Yrs		11-20 Yrs		21-30 Yrs		31-40 Yrs		41-50 Yrs		51 onwards	
	M	F	M	F	M	F	M	F	M	F	M	F
T.corporis	3	2	7	1	9	4	11	7	2	2	2	0
T.capitis	12	15	3	8	1	0	0	0	0	0	0	0
T.cruris	1	0	8	0	3	0	9	0	4	0	3	0
T.pedis	0	0	4	4	3	2	4	0	0	4	1	0
T.versicolor	0	1	9	4	6	1	1	0	0	0	0	0
T.unguium	1	1	0	2	3	2	1	2	5	1	2	1
T.mannum	0	0	0	0	1	2	0	3	1	4	0	1
T.barbae	0	0	1	0	0	0	3	0	0	0	0	0
Mixed infection	0	0	0	0	1	1	0	0	0	0	0	0
Total	17	19	32	19	27	12	29	12	12	11	8	2
	36		51		39		41		23		10	
Percentage	47.2	52.8	62.7	37.3	69.2	30.8	70.7	29.3	52.2	47.8	80	20
	18		25.5		19.5		20.5		11.5		5	

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 1.66:1. 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 3: KOH & Culture positivity

Investigation	Total	Percentage
KOH +	151 (200)	75.5
Culture +	74 (178)	41.6

Out of 22 cases of T. versicolor, 20 cases were positive in microscopy (90.9%). Microscopy was positive in 151 cases (75.5%), while culture was positive in 74 cases (41.6%) only.

Table 4: Relation between clinical types and mycological investigations

Sr. No.	Clinical types	No. of cases	KOH+ve Culture+ve	KOH+ve Culture-ve	KOH-ve Culture+ve	KOH-ve Culture-ve
1	Tinea corporis	50	17	22	0	11
2	Tinea capitis	39	19	9	2	9
3	Tinea cruris	28	10	13	0	5
4	Tinea pedis	22	13	4	1	4
5	Tinea unguium	21	3	10	1	7
6	Tinea mannum	12	2	5	1	4
7	Tinea barbae	4	2	0	0	2
8	Mixed infection	2	2	0	0	0
	Total	78	68	63	6	41
	Percentage		38.2	35.4	3.4	23.0

There was no evidence of fungus either by microscopy or culture in 41 cases (23%). 6 cases, which were negative in microscopy found culture positive.

Table 5: Types of fungi isolated

Types of fungi	Numbers	Percentage
T.mentagrophyte	35	47.3
T.rubrum	33	44.6
T.violaceum	3	4
T.tonsurans	2	2.7
C.albicans	1	1.4
Total	74	100

T. mentagrophyte (47.3%) was found to be the most (common) prevalent species, followed closely by *T. rubrum* (44.6%). There was no isolate of genus *Microsporum* or *Epidermophyton* in present study

Table 6: Clinical types in relation with etiological agents

Sr. No	Clinical types	T.mentagrophyte	T.rubrum	T.violaceum	T.tonsuran	C.albicans	Total
1	T.corporis	10 (58.8%)	7(41.2%)	0	0	0	17
2	T.capitis	11(52.4%)	5(23.8%)	3(14.3%)	2(9.5%)	0	21
3	T.cruris	5(50.0%)	5(50.0%)	0	0	0	10
4	T.pedis	6(40.0%)	9(60.0%)	0	0	0	15
6	T.unguium	0	3(75.0%)	0	0	1(25.0%)	4
7	T.mannum	2(66.7%)	1(33.3%)	0	0	0	3
8	T.barbae	0	2(100%)	0	0	0	2
9	Mixed infection	1(50.0%)	1(50.0%)	0	0	0	2
	Total	35	33	3	2	1	74
	Percentage	47.3	44.6	4.0	2.7	1.4	100

Table – 6 shows relation between pathogenic agent and clinical types. T. versicolor was not included because M.furfur is difficult to grow in laboratory. It is identified by microscopy alone.

- *T. mentagrophyte* was mainly isolated from
  - T. capitis
  - T. corporis
  - T. mannum

- *T. rubrum* was mainly isolated from
  - T. pedis
  - T. corporis
  - T. unguium
- All 3 isolate of *T. violaceum* and 2 isolate of *T. tonsurans* isolated from cases of T. capitis

Table 7: Comparison of rate of growth on SDA and DTM

Investigation	SDA –Growth after 10 days	DTM- Growth before 10 days
Number of cultures	58	62
Percentage	78.3	83.7

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 83.7 %. But, the appearance of growth was only after 10 days for78.3 % of specimens when grown on SDA with actidione.

DISCUSSION

Tinea corporis was the commonest clinical type of dermatomycoses in present study which is in agreement with a number of reports. 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[1], Amin et al[2] & Shah et al[3] carried out in this area as well in other studies outside like Vijaykumar et al[4] & Nita Patwardhan et al[5].

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[6], Khalidque et al[7], Poria et al[8] & others[9,10].

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 75.5 % 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[1], Vijaykumar et al[4] & Singh et al[15].

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[11], Sundaram et al[12], Behl & Sharma et[13] al, *T.mentagrophyte* was the commonest fungus isolated. *T.rubrum* was commonest isolated species in this area in previous studies. All isolates of *T. violaceum* and T. *tonsurans* were from cases of T. capitis. *T. violaceum* was also mainly isolated from cases of tinea capitis in studies of Poluri LV et al[14]. *Candida albicans* was isolated from a case of T. unguium. No other dermatophytes were isolated in our study.

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 DTM is not a preferred medium.

Conflict of interest: Nil
Source of support: Nil

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How to cite this article: Shah A, Mistry A, Rathod S, A study of 200 cases of dermatomycoses in Ahmedabad, Gujarat. Indian J Microbiol Res 2015;2(4):201-205.