

A Study of Superficial Mycoses with its Clinical Correlation at GMERS Medical College & Hospital Valsad, Gujarat

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Abstract


Background: Superficial mycotic infections constitute the bulk of mycotic diseases. Superficial mycoses are limited to skin, hair, and nails. The superficial fungal infections commonly encountered are dermatophytosis, candidiasis and pityriasis versicolor. Aim of this present study is mainly to evaluate the mycological profile of superficial mycoses with their causal association with its clinical presentation.

Method: The study was carried out at Department of Microbiology, GMERS Medical College, Valsad from November 2014 to April 2015. 73 various Skin scrapings, nail clippings and scalp scrapings were the clinical specimens taken for the study. Direct Microscopy was done with KOH (10% for skin and scalp and 40% for nail). Culture was done on Sabouraud's dextrose agar. The isolate were identified by colonial morphology, pigment production and direct examination of smear from the colony by tease mount and cellophane tape mount lactophenol cotton blue preparation & slide culture.

Results: Out of 73 samples, 44 (60.27%) were KOH positive and 33 (45%) were Culture positive. The commonest isolate was *Trichophyton spp* 16 (49%) followed by *Candida spp.* 7(21%) and other molds like *pseudoallescheria boydii*, *Fusarium*, *Penicillium*, *Aspergillus* 5(15%). Tinea corporis 30 (42%) was the most common clinical presentation. The commonest age group involved was 19-59 years.

Conclusion: The present study signifies the importance of mycological examination in diagnosis of superficial fungal infections. It is helpful to study fungal species commonly associated with superficial mycosis with various clinical presentation and also for further treatment

Key words: *Candida spp*, Superficial mycoses, *Trichophyton spp*, Tinea corporis, Tinea capitis.

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Introduction

Superficial mycoses refers to diseases of the skin and its appendages caused by fungi. This group includes Dermatophytosis, Pityriasis versicolor and Candidiasis.¹ They possess the affinity for parasitizing keratin rich tissues like skin, hair & nails and produce dermal inflammatory response and intense itching in addition to a cosmetically poor appearance.¹ The causative fungi colonize only cornified layer of epidermis or suprafollicular portions of hair & do not penetrate into deeper anatomical sites.²

The Dermatophytes are "among the commonest-fungal infectious agents of man".³ A dermatophytosis is a mycotic infection of the hair, skin or nails.³ On the basis of clinical, morphological & microscopic characteristics three anamorphic genera are recognised as dermatophytes: *Epidermophyton*, *Microsporum* & *Trichophyton*.³

The epidemiology of most of the clinically significant dermatophytosis has substantially changed

over the last few years. Now, *Trichophyton rubrum* is predominantly prevalent species throughout the world.² Though several reports on dermatophytosis are available from different parts of the country, there are only few reports on non dermatophytic fungi & yeast like fungi as causes of superficial mycoses along with dermatophytosis.⁴

Though there are many studies available across India and the rest of the world, there is very little data of superficial mycoses from our district of south Gujarat and area adjoining of Maharashtra. The present study was carried out to find out the clinical & mycological pattern of dermatophytosis & non dermatophytic fungi in patients attending GMERS Medical College & Hospital Valsad, Gujarat.

Material and Method

A retrospective study was done from November 2014 to April 2015 over a period of 6 months and total 73 specimens were processed from clinically suspected cases of superficial mycoses attending the outpatient department of Dermatology and Venereology of our hospital.

Detailed history of the patients regarding age, sex, site of lesion, occupation, and associated illness was taken and patients were examined clinically for the type & site of the lesion and classified accordingly.

Sample processing: The sample collection site was cleaned with cotton soaked in normal saline. The Clinical specimens (skin scrapping, infected hair taken by plucking, clipped nails) were collected in a small piece of sterile, dry paper. Immediately after collection, 10 % KOH mount examination was done and samples were inoculated on two slants of sabouraud's dextrose agar (SDA) and incubated at different temperature (25°C & 37°C) for a period of 1 month before giving negative result. Nail clippings were dipped in 40% KOH solution overnight for study on the next morning. If any growth was found on culture; then the isolate was identified by colonial morphology, pigment production

and direct examination of smear from the colony by tease mount & cellophane tape mount.

Results

In this study, out of total 73 patients, 50(68.49%) were male & 23(31.51%) were female. Among different age groups, highest incidence (76.71%) of superficial mycoses was seen in 19-59 years of age. It was noted that most common clinical presentation was *T.corporis* (41%) followed by Onychomycosis (19%). *T.capitis* occupied the third position with 9.58%. Two patients (3%) had infection at multiple sites. Distribution of clinical types with age & sex is shown in Table 1.

Table 1: Distribution of Clinical Types According To Age & Sex

Sr. No	Clinical Menifestation	Age groups in year				Total	Sex		Total
		0-11 Childre n	12-18 Adolescent	19-59 Adult	≥60 Elderl y		Male	Femal e	
1	<i>T.corporis</i>	1	1	23	5	30	22	8	30
2	<i>T.cruis</i>	0	0	4	0	4	4	0	4
3	<i>T.capitis</i>	2	1	3	1	7	2	5	7
4	<i>T.pedis</i>	0	0	4	0	4	4	0	4
5	<i>T.facie</i>	0	0	7	0	7	5	2	7
6	<i>T.mannum</i>	0	1	1	0	2	2	0	2
7	<i>T.versicolor</i>	0	2	1	0	3	3	0	3
8	Onychomycosis	0	1	12	1	14	7	7	14
9	<i>T.capitis</i> + <i>T.pedis</i>	0	0	0	1	1	0	1	1
10	<i>T.corporis</i> + <i>T.cruis</i> + <i>T.facie</i>	0	0	1	0	1	1	0	1

In our study, total positivity rate for fungal infection was 64.38% by KOH and Culture examination. Most of the clinically diagnosed cases were KOH positive. Out of total 73 samples, 44(60.27%) were KOH wet mount positive and among them 30(41%) were culture positive. 3 samples were diagnosed negative in KOH preparation but showed fungal growth, so overall culture positivity rate was 45.20%(33).

Table 2: Results of Culture & KOH Preparation

	Culture Positive	Culture Negative	Total (%)
KOH Positive	30	14	44(60.27)
KOH Negative	3	26	29(39.73)
Total (%)	33(45.20)	40(54.80)	73(100)

In present study the most common isolate was *Trichophyton spp* (48%) from *T. cruris* followed by *T.corporis*, *T.capitis* & *T.pedis*. The second common isolate was *Candida spp* (21%) which were isolated most commonly from Onychomycosis, *T.capitis* & *T.corporis*. Two isolates of *Microsporum spp.* were obtained from *T.corporis* & *T.cruis*. *Epidermophyton spp.* was grown from *T.faciei*. Two isolates of *Malassezia furfur* were obtained from cases of pityriasis versicolor. Other molds like *pseudoallescheria boydii*, *Fusarium sp.*, *Penicilliu sp.*, *Aspergillus niger* were isolated from *T.corporis* & Onychomycosis.

Among the Dermatophytes, the commonest isolate was *Trichophyton tonsurans* (21.21%) followed by *Trichophyton mentagrophytes* (18.18%).

Table 3: Clinico-Mycological Co- Relation of Dermatophytosis

Fungus	T.corporis	T.cruis	T.capitis	T.pedis	T.facei	T.mannum	T.versicolor	Onycho mycosis	T.capitis +T.pedis	T.cruis+T.corporis+T.facei	Total (%)
<i>T. tonsurans</i>	1	0	3	2	0	0	0	1	0	0	7
<i>T.mentagrophytes</i>	2	3	0	0	0	0	0	0	0	1	6
<i>T.rubrum</i>	0	0	0	1	0	0	0	0	0	0	1
<i>T.schoenlenii</i>	0	1	0	0	0	0	0	1	0	0	2
Microsporum spp	1	1	0	0	0	0	0	0	0	0	2
Epidermophyton spp	0	0	0	0	1	0	0	0	0	0	1
<i>Malassezia furfur</i>	0	0	0	0	0	0	2	0	0	0	2
Candida spp.	1	0	2	0	0	0	0	4	0	0	7
Other molds	3	0	0	0	0	0	0	2	0	0	5
Total	8	5	5	3	1	0	2	8	0	1	33

Table 4: Comparison with other Studies

	Present study	Grover wcs¹	Aruna Agrawal⁴	Mishra⁵	Nawal⁶	Parul⁷	V Bindu⁸	Bhavsar H⁹
Male: Female Ratio	2.17:1	4.26:1	1.8:1	-	1.8:1	1.75:1	2.06:1	2.14:1
Commonest Age groupe involved	Adult (76.71%)	21-30yrs (39.6%)	>20 yrs (68%)	Adult	Adult (66.5%)	21-30 yrs (29.3%)	11-20 yrs (23.3%)	Adult (76.12%)
Commonest Clinical site involved	T.corporis (41.09%), Onychomycosis (19%)	T.pedis (29.2%), T.cruris (26.2%)	T.corporis (36.1%), T.cruris (28.1%)	T.versicolor (33.95%), T.corporis (24.55%)	T.corporis (40.8%), T.cruris (27.8%)	T.corpori s (64%), T.capitis (11.11%)	T.corporis (54.6%), T.cruris (38.6%)	T.corporis (52.78%) T.cruris (15.64%)
Infection involving multiple sites	3%	17.3%		25%				5.06%
Commonest species	T.tonsurans (21%), Candida spp (21%)	T.tonsurans (20.5%), T.rubrum (8.7%)	T.rubrum (62.3%), T. mentagrophytes (23.4%)	T.rubrum (76%)	T.rubrum (67%), T. mentagrophytes (14.1%)	T.rubrum (54%), T. mentagro phytes(3 2%)	T.rubrum (66.2%), T. Mentagrophytes (25%)	T.rubrum (55.26%), T. mentagrophytes (27.63%)
KOH positivity rate	60.27%	53.30%	59.20%		72.40%	62.12%	64%	68.18%
Culture positivity rate	45.20%	79.10%	50.40%		62.80%	29.29%	45.30%	20.15%
KOH & Culture both positive	41%		45.40%			26.77%		15.91%
KOH negative but culture positive	4.2%	28.5%	1.60%		7.70%	2.53%	11.30%	4.20%

Discussion

Most superficial fungal infections are easily diagnosed and readily amenable to treatment. Present study was carried out on the patient attending the OPD of our tertiary care hospital in Valsad, Gujarat from November 2014 to April 2015 with a view to find out the clinical pattern of dermatophytosis and species prevalence in this area. Hospital caters to the patients from most parts of South Gujarat as well as border areas of Maharashtra. People belonging to this area are mainly dependent on agriculture work and doing laborious physical work leading to more sweating, exposed to soil which probably could be the reason to contract saprophytic fungal infection. The Humidity in this area is very high which facilitates body sweating and fungal growth.^{4,5,6}

Observations of this study are compared with studies of other authors in table no 4.

In present study, males are more affected than females; with male to female ratio are 2.17:1. Other studies, done by Aruna Aggarwal (1.8:1)⁴, Nawal(1.8:1)⁷, Grover WCS (4.26:1)¹, Parul (1.79:1)⁶, V bindu (2.06:1)⁸, Bhavsar H(2.14:1)⁹ have similar observation.

In our study, adult age group (76.71%) is most commonly affected. It is explained by the higher incidence of physical activity & sweating in them. This finding is well correlated with studies done by Aruna Aggarwal, Nawal, Grover WCS, Parul, M Misra, Bhavsar H respectively.^{4,7,1,6,5,9}

The commonest clinical type seen in our study is *T.corporis* (41.09%) which is also corroborated well with other studies i.e. Amritsar 36.1%⁴, Surat 64%⁶, Ahmedabad 40.8%⁷, Calicut 6%⁸. However study done in military recruits in North east India by Grover et al involving soldiers as a major group, showed *T.pedis* as the commonest manifestation which could be well correlated to the profession of army personnel as they have to wear closed shoes for longer hours of the day. In sharp contrast is the study by M Mishra, where *T. versicolor* was major group. Among various methods, the KOH preparation has shown good sensitivity in comparison with culture. In our study, KOH positivity rate is 60.27% & culture positivity rate is 45.20% The study is in lines with the other studies done across various parts of India, they had also shown KOH positivity rate as 59.20%⁴, 53.3%¹, 62.12%⁶, 72.4%⁷, 64%⁸ and culture positivity rate are depicted in other studies i.e. 50.4%⁴, 79.1%¹, 29.29%⁶, 62.8%⁷, 45.3%⁸.

There are 3 cases in which KOH is negative but culture is positive (4.1%). Similar finding is also noted by other investigators 1.6%⁴, 28.5%¹, 2.53%⁶, 7.7%⁷, 11.3%⁸.

The commonest isolated fungal species in present study is *Trchophyton tonsurans*(21%) and *Candida* spp.(21%) followed by *T. mentagrophytes*(18.18%). *T. tonsurans* was also the commonest isolate in the study of Grover et al. However *T.rubrum* was the commonest

species in the studies done by Aruna Aggarwal (62.3%)⁴, Parul(54%)⁶, Nawal (67%)⁷, V bindu (66.2%)⁸, S sen (68.63%)¹⁰, M Misra (76%)⁵. It could be explained on the basis of different climatic conditions and geographic distribution. *Candida* spp is the commonly isolated from onychomycosis, However *T.rubrum* was commonest spp isolated from Onychomycosis.^{6,9}

Conclusion

The present study of 73 cases at our tertiary care hospital, Valsad shows that males are predominantly affected. Majority of the cases were from *T. corporis* and most common etiological agent is *T.tonsurans*. KOH examination is shown to be more sensitive than culture although the findings of this study matches with many studies done across India, it differs significantly with some studies suggesting the role of geographical variation in clinical and mycological pattern.

Conflict of Interest: None

Source of Support: Nil

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