



## PATTERN OF CLINICAL DERMATOPHYTIC INFECTIONS IN THE PATIENTS ATTENDING OPD IN TERTIARY CARE HOSPITAL OF MADHYA PRADESH: AN OBSERVATIONAL STUDY

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### ABSTRACT

**Background:** Superficial dermatophytic infection is infection of skin nail or hair with fungus. Nowadays, these fungal infection are at a rise and run a prolong course despite of treatment due to resistance to conventional antifungal agents.

There is a felt need to conduct epidemiological study to know the change in the pattern and cause of widespread resistance. This study was aimed at identifying clinico-mycological pattern of dermatophytic infections in patients attending the dermatology outpatient department of a tertiary care hospital in eastern Uttar Pradesh and adjoining area.

**Methods:** Patients with suspected dermatophytoses attending the outpatient department were enrolled in the study. A detailed history, clinical examination and sample collection for mycological examinations was done.

**Results:** There were 300 patients recruited in the study, with a male: female ratio of 2:1. The most commonly affected age group was 20–30 years (34.7%). Tinea cruris and corporis was the most common type observed (33.3%). Potassium hydroxide positivity was seen in 390 samples (72%) and culture positivity was found in 350 samples (68%). The most common species identified was *Trichophyton verrucosum* (35.3%).

**Conclusions:** There is a rise in dermatophytic infection caused by zoophilic species like *Trichophyton verrucosum*.

**KEYWORDS :** Dermatophytosis, Central India, Tinea.

### INTRODUCTION

Fungal infection of skin and appendages is termed as Superficial mycoses. This cluster of diseases encompasses dermatophytosis, pityriasis versicolor, and candidiasis and nondermatomycotic molds.<sup>1</sup>

India is a broad geographical area with variety of climatic and topographic conditions. The moist and temperate climate favors the aquirement and continuity of fungal infections.<sup>2</sup> Apart from from climatic predisposition overcrowding, poor socioeconomic condition and poor hygiene further make people acquiring fungal infection. There is a well known diversity in endemic and most prevalent fungal species but overall prevalence of fungal infection is global.<sup>3</sup>

Even India the pattern of superficial fungal infections vary from one part to another as shown by different studies.<sup>2,6</sup>

We used conventional methods of isolation and identifications of dermatophyte species from superficial mycoses in human patients to study the recent rise in tinea infection and change in epidemiological pattern of the disease. This study was conducted in heart of India to evaluate the pattern and prevalence of superficial mycosis in central Indian population.

### METHODS

A prospective observational study was carried out in 300 patients attending dermatology OPD of L. N. Medical College and research Centre, Bhopal with superficial mycotic infection from May 2018 to April 2019.

All patients attending skin OPD with suspected lesions of tinea infections were included in the study. Light microscopy of KOH preparation for scales of skin/hair/nail scrapings will be taken from lesions shows hyphae or conidia and/or culture positive patients, and All KOH positive and/or culture positive samples will be included for further data analysis.

Data was collected about patient's identification number, age, sex, occupation, history and clinical presentation including specific risk factors for superficial fungal infection. For patient with visible and sufficient scales on lesion; Nail, hair and skin specimen were collected as per standard techniques. After cleaning the affected area with 70% alcohol and the specimen was obtained by scraping the edge with scalpel, hairs from the lesions were epilated and scales were obtained by scraping the edges and nail clippings or subungual deposits were taken. Microscopic examination was done on a clean glass slide and 10% KOH for skin scrapping and 20% KOH for hair and nail sample was taken. It was left for 30 minutes to 1 hour at room temperature. Preparation was observed in 40 X magnification under bright field microscope. Slides which were initially negative were re- examined

next day. Culture, isolation and identification of fungal isolates-specimen from skin and hair are inoculated in one media SDA with cycloheximide (0.05 g/l) along with chloramphenicol (0.005 g/l) while that obtained from nail were inoculated in two test tube one containing only chloramphenicol for isolation of dermatophytes and non dermatophytes while other test tube has both chloramphenicol and cycloheximide to inhibit non dermatophytes.

Fungal isolates were identified by observing colony morphology, colour, consistency, topography etc. and were further examined under microscope after staining with lactic phenol cotton blue.

### RESULTS

Out of 300 patients, 189 were male and 111 were female. Male to female ratio was 2:1. The youngest patient was 8 months old and the oldest patient was 75 years old. Majority of patient belonged to age group 20-30 years i.e. 34.7%. This can be seen in Table 1.

Age	Male		Female		TOTAL	
	n	%	n	%	N	%
<20	40	21.2	9	8.1	49	16.3
20-30	78	41.3	26	23.4	104	34.7
30-40	25	13.2	38	34.2	63	21.0
40-50	28	14.8	14	12.6	42	14.0
>50	18	9.5	24	21.6	42	14.0
<b>TOTAL</b>	<b>189</b>	<b>100</b>	<b>111</b>	<b>100</b>	<b>300</b>	<b>100.00</b>

Table 2 shows the site involved in the patient showing that most common site of infection was mixed type i.e. tinea cruris and tinea corporis accounting for 33.3% followed by tinea corporis alone.

SITE	Males		Female		TOTAL	
	n	%	n	%	N	%
<b>T. cruris</b>	37	69.9	10	11.1	47	15.7
<b>T. corporis</b>	29	54.8	29	32.2	58	19.3
<b>T. faciei</b>	6	11.3	2	2.2	8	2.7
<b>T. mannum</b>	4	7.6	2	2.2	6	2
<b>T. pedis</b>	4	7.6	3	3.3	7	2.3
<b>T. unguim</b>	16	30.2	7	7.8	23	7.7
<b>T. capitis</b>	3	5.7	3	3.3	6	2
<b>T. corporis and T. cruris</b>	59	111.5	41	45.5	100	33.3
<b>Other mixed infections</b>	31	58.6	14	15.5	45	15
<b>TOTAL</b>	<b>189</b>	<b>100</b>	<b>111</b>	<b>100</b>	<b>300</b>	<b>100</b>

It was seen that secondary infection was present in 15.7% cases only and diabetes, hyperhidrosis and immunosuppression were important associated condition. While family history was positive in nearly 40% showing the importance of person to person transmission as well as treatment of all family members simultaneously.

Species Site	T. verrucosum		T. Mentagrophytes		T. rubrum		T. tonsuranus		Total
	n	%	n	%	n	%	n	%	N
T. corporis	16	45	13	36.36	6	18.18	0	-	35
T. cruris	7	24	15	48.18	9	27.77	0	-	31
T. faciei	1	28	2	57.14	1	14.2	0	-	4
T. pedis	1	20	2	60	1	20	0	-	3
T. manuum	0	14.7	1	71.4	0	14.27	0	-	2
T. capitis	0	-	0	-	1	28.5	0	-	4
Onychomycosis	0	-	7	47.82	7	52.17	0	-	14
T. corporis and T. cruris	27	40.1	18	26.78	13	18.75	8	11.6	67
Others	20	48.57	4	8.57	5	11.42	15	35.7	42
<b>TOTAL</b>	<b>72</b>	<b>35.29</b>	<b>62</b>	<b>30.39</b>	<b>43</b>	<b>21.08</b>	<b>23</b>	<b>11.28</b>	<b>204</b>

Culture on SDA showed culture was positive for 68% Cases while KOH mount examination revealed 72% positive cases.

Thus the most common species associated was *T. verrucosum* (35.5%) followed by *T. mentagrophytes* (30.8%).

## DISCUSSION

In this study, as seen in Table 1 majority of patients i.e. 34.7% were adults in age group 20–30 years which is was seen in previous studies also.<sup>7,8</sup> Male: female ratio was 2:1; a male preponderance bit higher than ours in some earlier studies.<sup>9-13</sup>

Female are more susceptible to develop tinea pedis, tinea manuum and onychomycosis due to household work.<sup>14-16</sup>

As seen in Table 9 potassium hydroxide examination for fungal elements was positive in 72% of the patients. Previous studies had reported similar findings for potassium hydroxide positivity.<sup>17-21</sup> In the present study, culture positivity was 68 per cent; previous reports show a variance of this ranging from 24 to 87 per cent.<sup>22-25</sup> In studies conducted between 2002 to 2011, *T. rubrum* was the most common isolate while in some studies *T. mentagrophytes* was seen as most common isolate. Similar findings were also observed by Sahai and Mishra and Bhatia and Sharma.<sup>26</sup> Ajello, in 1960, said “species not only differ from region to region but may change with the passage of time.”

The isolation rate in our study is higher as compared to various other studies where it ranged from 50-60%.<sup>27,28</sup> While previous studies had shown that *T. rubrum* was the most common isolated fungal species followed by *T. mentagrophytes* our study showed that *T. verrucosum* was the most common isolate.

This could be explained as an occupational hazard as most patients come here work in farms and work with cattle.

There were isolation in cultures of non dermatophytic molds even on repeat cultures. They commonly considered as contaminants, they have been reported to colonize damaged tissues and cause secondary tissue destruction. Their role in causing cutaneous infections is not proven and a primary pathogenic role of NDM is controversial.<sup>29</sup> But these species are increasingly implicated in causing primary invasion of the nail in onychomycosis.<sup>30,31</sup> It is suggested that this subgroup may have a direct causative role as it fulfills the criteria of a pathogen (proposed initially for nails) viz isolation in pure culture, KOH positivity and non-isolation of dermatophytes in the culture.<sup>32</sup>

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