

# A Study of Prevalence of Etiological Agents of Dermatophytosis in a Tertiary Care Hospital.

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## ABSTRACT

**Background:** Dermatophytoses are commonly encountered fungal diseases prevalent in most parts of the world especially in tropical countries. It is a superficial mycotic infection affecting hair, skin and nails. The present study was carried out to determine the incidence of dermatophytoses and their etiological agent in different age groups attending the Dermatology department. **Methods:** A total of 200 samples were taken from skin department and processed by direct KOH preparation & fungal culture methods. Identification of the species was done by Lactophenol Cotton Blue mount from colony. **Results:** Our study shows that males 60 (68.41%) are more infected than females 40 (31.59%) Tinea corporis was the commonest clinical type 59 (55.75%). The commonest fungal isolate is Trichophyton species (51.72%), followed by Micro-sporum 38 (36.92%) and Epidermophyton species 11(9.31 %). **Conclusion:** Male have higher fungal infection rate than females. Trichophyton rubrum is the common isolate in our geographical area. KOH preparation has higher positivity rate than culture.

**Keywords:** Dermatophytes, Trichophyton, Tinea corporis.

## INTRODUCTION

In tropical countries superficial fungal infections are among the world's most common diseases. It has become a significant health problem affecting children, old age adolescents and adults. Dermatophytosis is a superficial mycosis infection commonly referred to as "ringworm" is group of fungi that infect keratinous tissue, with the skin, hair and nails being the most common sites.<sup>[1,2]</sup> On the basis of clinical, morphologic & microscopic characteristics three anamorphic genera are known Epidermophyton, Microsporum & Trichophyton.<sup>[1]</sup> In recent years the incidence of infections caused by dermatophytes has increased considerably.<sup>[2,3]</sup> This may be due to frequent usage of antibiotics, immunosuppressive drugs and various conditions like organ transplantations, lymphomas, leukemia and human immune-deficiency virus (HIV) infections.<sup>[4]</sup> Clinically, the different types of dermatophytosis are classified according to body site involvement.<sup>[5]</sup> Although the clinical signs of dermatophytosis may vary depending on the affected region of the body, pruritus is the most common symptom in humans.<sup>[6]</sup>

disorders that may be due to rampant application of broad-spectrum steroid containing skin ointments and creams leading to further misdiagnosis and mismanagement.<sup>[7]</sup> The epidemiology of most of the clinically significant dermatophytosis has substantially changed over the last few years. The distribution of the dermatophytosis and their etiological agents varies with geographical location and depends on several factors, such as lifestyle, type of the population, migration of people, climatic conditions, personal hygiene and individual's susceptibility therefore some species are widely distributed whereas others are geographically restricted. Superficial mycosis is more prevalent in tropical and subtropical countries including India, where heat and moisture play an important role in promoting the growth of these fungi.<sup>[8,9]</sup> In this study, we undertook a clinical and mycological approach, correlating various demographic data such as age, sex and occupation with isolation and identification of the fungus using standard mycological techniques.

## MATERIALS & METHODS

This study was done from March 2014 to April 2015. Patient was selected from skin outpatient department of Rohilkhand medical college & hospital after the ethical committee clearance. A detailed history of the patients regarding name, age, sex, occupation, duration of illness and involvement of the site and clinical presentation were taken. A total of 200 specimens were processed in the Department of Microbiology from clinically suspected cases of superficial mycoses attending the outpatient

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The clinical presentation, though very typical of ringworm infection, is often confused with other skin

Department of Skin of our hospital. The affected area was cleaned with 70% alcohol. The skin scraping was done from active peripheral margin of the lesion without injuring the skin surface.<sup>[10,11]</sup> The deeper fragments or crusty deposits from the junction of affected nail were collected with the help of sterile scissors or nail clippers.<sup>[10,11]</sup> A few affected hairs were also epilated and collected with a pair of flame sterilized tweezers.

**KOH wet mount:** 10 % and 20% KOH was used for skin/hair and nails respectively. This preparation was kept for 20-30 minutes (for hairs) and overnight (for nails) and observed under microscope for morphological study of fungi.<sup>[11]</sup>

**Cultures:** The specimens were inoculated onto slopes of duplicate sets of tubes containing Sabouraud's dextrose agar with chloramphenicol and cycloheximide (HIMEDIA, MUMBAI) and incubated at 37°C and 25°C. The cultures were examined for every two days for a period of one month for the presence of growth with respect to the colonial appearance like size, surface, color, margin, texture, diffusion of pigmenting the media. The specimen were also inoculated on the selective medium i.e. Dermatophyte Test Media (HIMEDIA, MUMBAI). It indicates growth of dermatophytes with color changes of the medium from yellow to red. The growths were identified by slide culture and lacto-

phenol cotton blue mount. The modified Christensen's urease was used as additional test to identify Trichophyton mentagrophytes.

## RESULTS

Among 200 clinical samples from suspected cases of dermatophytosis, the dermatophytes have been isolated from 100 (46.06%) samples. The culture was positive from 60 (68.41%) samples from men and 40 (31.59%) from females. The direct microscopy was positive for 125 (62.23%) samples. The age of the patients ranged from 7-65 years, the mean age being 36 years. The laboratory confirmed cases of dermatophytoses are more common in males as compared to females. The distribution in males and females are depicted in [Table 1]. The clinically and laboratory confirmed positive cases are depicted in [Table 2]. Direct microscopy revealed fungal elements in 62.23% of the cases. The various predisposing factors associated with the infection are depicted in [Table 3].

Table 4 shows that Trichophyton species (55.75%) was the main etiological agent of different clinical types of tinea. The most common clinical type were Tinea corporis 52 (51.34%) and Tinea cruris 29(26.26%).

**Table 1:** Distribution of culture confirmed positive cases among males and females of different age group.

Age Group	Male	Female
0-10	6	4
11-20	15	8
21-40	30	20
>40	9	8
Total	60	40

**Table 2:** Frequency of Dermatophytosis among males and females.

Sex	Clinical suspect case	Direct microscopic positive	Culture positive
Male	112	85	60
Females	88	40	40
Total	200	125	100

**Table 3:** Risk factors associated with Dermatophytosis.

Serial no	Risk Factors like occupation	Number of suspect case
1	Farmers	74
2	Daily waged workers	45
3	Students	42
4	Housewives	25
5	Athletes	7
6	Barbers/Masseurs	6
	TOTAL	200

## DISCUSSION

“Ring worm” infection is one of the commonest superficial mycoses which affect literally all age groups in countries like India. India bears tropical

climate which have temperature and humidity favorable for dermatophytosis. This study shows that 100 (46.06%) cases were culture positive among the 200 (100%) clinically suspected cases of dermatophytosis which is slightly lower than the

study conducted in Nepal from September 2008 to February 2012.<sup>[12]</sup> This may be due exposure of the patients to conducive occupational and environmental conditions. The male (65.31%) were more commonly infected than the females (38.55%) which is in line with the various studies<sup>[13,14]</sup> which are attributed by the fact that they are more exposed to the risk factors while there is increased health awareness among the women and their positive attitude towards treatment and their beauty consciousness. The Preponderance of dermatophytosis among age group 21- 40 years in our study is in accordance with past studies.<sup>[15,16]</sup> Increased incidence in this age group is because they are engaged in farming and other physical labor in hot and humid environment, increased sweating that may facilitate parasitization of fungus. The incidence

and prevalence rate may only be representative of the population sampled, which may have associated risk factors for dermatophytosis. Our study showed various risk factors like nature of job (farmers and laborers 68.78%), personnel hygiene that can be considered with all the clinically suspected patients, and the climatic condition. This is also similar with other studies conducted in India, Nepal and Italy.<sup>[15-17]</sup> The other clinical types were Tinea capitis 13 (8.75%), Tinea pedis 06 (3.55%), Tinea faciei 02 (4.75%), Tinea barbae 04 (4.87%), Tinea unguum 02 (4.75%). Most of the isolates obtained are of Trichophyton 59(55.75%), followed by Microsporum 38 (36.92%) and Epidermophyton 11(9.31 %) which is in conformity with a report from Italy which shows predominant isolate as Trichophyton.<sup>[18]</sup>

**Table 4:** Different genus of Dermatophytes isolated from Different clinical types.

Clinical Types	Trichophyton Species	Microsporum Species	Epidermophyton Species	Total
Tinea corporis	26	20	6	52(51.34%)
Tinea cruris	16	11	2	29(26.26%)
Tinea capitis	7	5	1	13 (6.75%)
Tinea pedis	4	1	1	6(3.55%)
Tinea faciei	2			2(4.75%)
Tinea barbae	2	1	1	4(5.87%)
Tinea unguum	2			2(4.75%)
<b>Total</b>	<b>59 (55.75%)</b>	<b>38 (36.92%)</b>	<b>11 (9.31%)</b>	<b>108(100%)</b>

## CONCLUSION

The study highlighted that Tinea corporis and Tinea capitis are the most prevalent clinical types of dermatophytosis among the young age group in western Uttar Pradesh. Largely the predominant most common etiological agents belong to genus Trichophyton and Microsporum. The Fungal species causing Dermatophytosis may vary from place to place due to various predisposing factors. Hence fungal cultures helps to improve the diagnosis when prolong treatment is required.

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