

## “A clinico epidemiological study of dermatophytosis in a tertiary care center, Ujjain”

Ujjwal Kumar<sup>1</sup>, Mahendra Pratap Singh Chauhan<sup>2,\*</sup>, Krishnendra Varma<sup>3</sup>

<sup>1</sup>Associate Professor, <sup>2</sup>Junior Resident 3<sup>rd</sup> Year, <sup>3</sup>Professor and HOD, <sup>1-3</sup>Dept. of Dermatology, Venereology and Leprosy, Ruxmaniben Deepchand Gardi Medical College, Ujjain, Madhya Pradesh, India

**\*Corresponding Author: Mahendra Pratap Singh Chauhan**

Email: chauhandrmps@gmail.com

### Abstract

**Introduction:** Dermatophytes are fungi that can cause infections of the skin, hair & nails due to their ability to invade keratin. Dermatophytosis is the most common superficial fungal infection worldwide, more common in tropics and subtropical regions. It may present in epidemic proportions in areas of high humidity.

**Aims and Objectives:** The present study is aimed to determine the distribution and to identify the clinical types of dermatophytosis that are prevalent in Malwa region.

**Materials and Methods:** A total of 298 samples were collected from infected skin, hair and nails for a period of 1 year. Samples were collected under aseptic condition by skin scrapping, nails and hairs clipping by using scalpel or forceps and were then subjected to direct microscopy by potassium hydroxide (KOH) mount.

**Results:** Dermatophytosis manifested more in the age group of 21-30 years, with male predominance. Among various clinical types, tinea cruris was the commonest type. Direct microscopy on KOH mount revealed the presence of dermatophytic fungi in 71.8% of the samples.

**Conclusions:** Dermatophytosis is the commonest disease presenting in dermatology clinics and are responsible for myriad of clinical manifestations in human. Empirical use of steroid/mixed preparations, poor patient compliance due to high cost and changing dress sense are some important contributing factors for the real upsurge in incidence and prevalence of dermatophytosis in the last few years.

**Keywords:** Dermatophytoses, Tinea cruris, Tinea corporis.

### Introduction

Dermatophytes are a group of closely related filamentous fungi that can cause infections of the skin, hairs & nails due to their ability to utilize keratin.<sup>1</sup> They are classified into three genera: Microsporum, Trichophyton, and Epidermophyton. Trichophyton rubrum has been the most common isolates. These superficial cutaneous mycoses affect 20% to 25% of the world's population.<sup>2</sup> In the present scenario of India, dermatophytoses (Ring worm infections) constitute the most common skin condition in dermatology clinics. Clinically, dermatophytoses can be classified on the basis of site involved.

The hot and humid climate in tropical and subtropical countries like India makes dermatophytoses a very common fungal skin infection. Obesity, poor hygiene, overcrowding, immunodeficient conditions are some other risk factors. Chronic steroid abuse has now become the leading cause of chronic and recalcitrant dermatophytoses now a days. Many significant changes in the classical features have been noted in the present epidemic.

### Materials and Methods

The present study was conducted in the department of Dermatology at R.D.G.M.C Ujjain (Malwa region of Madhya Pradesh) for a time period of one year from Jan2017 to Jan 2018. The study group comprised of 298 clinically suspected cases of dermatophytoses. A detailed clinical history including age, sex, duration, occupation and the clinical presentation were noted. On the basis of anatomical site of involvement they were grouped into various clinical types. Samples were collected under aseptic condition by skin scraping, nails and hair clipping by using scalpel or forceps in sterile petri dishes. Direct microscopy

was done by using 10% potassium hydroxide (KOH) for skin scraping and 20% KOH for epilated hair & nail clipping specimens.

### Results

Peak incidence of dermatophytoses was seen in the third decade of life. Majority (32.2%) of the patients belonged to the age group of 21-30 years, followed by 31-40 years 22.8% and least from the age group 61-70 years 4.6%, pediatric cases comprised of 7.3% [Table 1]. There was male predominance (76%) in the study patients and the overall male to female ratio was 2.92:1 [Table 2]. Majority (57.7%) patients were from rural areas [Table 3]. The highest number (20.1%) of the patients were agriculture farmer/ labor and the proportion of housewives were 16.1%, students 14.7%, laborers 6% formed the bulk of patients [Table 4]. The maximum percentage (40.2%) of patients were from lower middle class. The proportion of 28% were in upper lower class, 16.1% in upper middle class, 11% were in lower class and 5.3% were in upper class (Table 5). Family history was found positive in (41.6%)[Table 6]. The proportion of patients who gave history of steroid abuse was (34.9%) [Table 7]. History of recurrence was found in (37.5%) [Table 8]. History of recurrence was present in (37.5%) [Table 8]. Tinea cruris was the most common clinical presentation (23.4%) followed by tinea corporis 14%. However the percentage of tinea faciei, tinea pedis, tinea unguium, tinea manuum and tinea capitis were 5.3%, 4.7%, 3.3%, 2.6%, 2% respectively [Table 9]. Combination pattern was present in (44%), where association of tinea cruris with tinea corporis was maximum in (39.3%) followed by tinea cruris et tinea corporis et tinea faciei [Table 10][Fig. 1]

On KOH mount examination 214 out of 298 (71.8%) clinically suspected cases were KOH positive [Table 11].

## Discussion

In the present study, maximum number of patients belonged to the age group of 21-30 years (32.2%) followed by 31-40 years 22.8% similar inference has been drawn by other workers.<sup>3-5</sup> Males (76%) were more commonly affected than females (24%) and male to female ratio was 2.92:1 which has also been observed in other studies.<sup>6-10</sup> Male predominance could be due to more outdoor physical activities and tight fitting clothing, which could have lead to pronounced sweating and an increased opportunity for infections. Males visit hospital frequently than females who might not be very open for hospital visits for dermatological infections.

The study of occupational profile of the patients showed that agriculture farmer/labor constituted the majority of patients. Housewives are also at high risk due to long hour of immersion of hands and feet in water, increasing the risk of tinea manuum, tinea pedis, tinea unguium. Even the students have a significant proportion, probably attributable to changing fashion trends, skin fit denim jeans which are increasingly preferred by youngsters and their non-suitability to our hot and humid environment. Association of occupation and dermatophytoses was also observed by many workers in the past, showing negative impact on the quality of life and productivity which was concordance to previous studies. High incidence of dermatophytosis infection in farmers and forestry workers was also reported by Sahin et al.<sup>11</sup>

In the present study most of the patients belong to lower middle class (40.2%) and upper lower class 28%, which could be attributed to poor hygienic practices poverty, lack of self care, ignorance and social belief of seeking non-medical advice and remedies. Family history of superficial dermatophytoses was present in 41.6%, just like that of scabies, there by showing familial tendency. Probably due to direct physical contact & fomites like sharing of beds, linens and clothing is common among family members.<sup>12-14</sup>

The history of steroid/FDC cream use was found in (34.9%) patients & the proportion of (37.5 %) had history of recurrence, as irrational FDC creams (containing potent topical steroid, antifungal, antibacterial) are freely available over the counter, which are cheaper than standard topical antifungal creams. These are used by patients on their own will for weeks, months and sometimes even for years, whenever patient has symptoms of itching and inflammation leading to a chronic and recurrent course.<sup>12,13</sup> We also observed an increased number of atypical presentation of tinea infection [Fig. 2 & Fig. 3].

In the present study tinea cruris was most common variety which was accordance with studies by other workers.<sup>15,16</sup> Tight ill fitting dressing, complex anatomical structures and over humidification could be the reason behind it. Among mixed clinical types tinea cruris et tinea corporis was the highest (39.3%) similar findings have been reported in other studies.<sup>17</sup> KOH wet mount direct

microscopy examination showed (71.8%) samples were positive in our study, while positive rates ranging from 23.8% to 91.2% have been reported by various workers.<sup>18-21</sup> Selection criteria of cases and the skill involved in sampling technique might be responsible for the difference.

**Table 1: Distribution of patients according to age (N=298)**

Age in years	Patients	%
0-10	16	5.3
11-20	30	10
21-30	96	32.2
31-40	68	22.8
41-50	54	18.1
51-60	20	6.7
61-70	14	4.6

**Table 2: Distribution of patients according to sex**

	Male	Female	Total	M:F ratio
Number of cases	222	76	298	2.92:1
Percentage	76%	24%	100	

**Table 3: Distribution of patients depending in the type of location**

Address	Number	Percentage
Rural	172	57.7
Urban	126	42.2
Total	298	100.0

**Table 4: Distribution of patients according to occupation**

Occupation	Number of cases	Percentage
Agricultural farmer/labor	60	20.1%
Housewife	48	16.1%
Student	44	14.7%
Businessman	20	6.7%
Labor	18	6%
Driver	16	5.3%
Mechanic	12	4%
Restaurant/ Dhaba worker	12	4%
Teacher	12	4%
Shop owner	12	4%
Electrician	10	3.3%
Sales representative	8	2.7%
Others	26	8.7%

**Table 5: Distribution of patients according to socioeconomic status**

Socio-economic status	No. of cases (%)
Upper	16(5.3%)
Upper middle	48(16.1%)
Lower middle	120(40.2%)
Upper lower	82(28%)
Lower	32(11%)

**Table 6: Distribution of patients according to family history**

Family history	Number	Percentage
Present	124	41.6

**Table 7: History of steroid abuse**

History of steroid abuse	Number	Percentage
Present	104	34.9%
Absent	194	65.1%

**Table 8: History of recurrence**

History of recurrence	Number	Percentage
Present	112	37.5
Absent	186	62.5

**Table 9: Clinical type of dermatophytoses in present study (n=298)**

S.no.	Clinical type	No. of cases	Percentage
1	Tinea cruris	70	23.4
2	Tinea corporis	42	14
3	Tinea faciei	16	5.3
4	Tinea pedis	14	4.7
5	Tinea manuum	8	2.6
6	Tinea unguium	10	3.3
7	Tinea capitis	6	2
8	Combination pattern	132	44.2

**Table 10: Combination of various clinical types of dermatophytoses**

Combination of various clinical types of dermatophytoses	Total number	Percentage (%)
T. cruris et T. corporis	52	39.3
T. cruris et T. corporis et T. faciei	20	15.1
T. cruris et T. corporis et T. pedis	8	6
T. cruris et T. faciei	12	9
T. cruris et T. pedis	8	6
T. corporis et T. faciei	6	4.5
T. manuum et T. unguium	6	4.5
T. pedis et T. manuum	12	9
T. pedis et T. unguium	8	6

**Table 11: Distribution of samples on the basis of KOH mount findings**

Total no. of cases	KOH positive	KOH negative
298	214(71.8%)	84 (28.2%)
Total no. of cases	KOH positive	KOH negative
Absent	174	58.3



**Fig. 1: Combination pattern (Tinea corporis with Tinea cruris)**



**Fig. 2: Double-edged tinea due to application of potent steroids.**



**Fig. 3: Atypical pustular form of Tinea corporis (Tinea incognita) due to steroid abuse.**

### Conclusion

Dermatophytosis (superficial fungal infection) is the commonest disease presenting in dermatology O.P.D.

A real upsurge in the incidence and prevalence of dermatophytosis has been noted for last few years. Empirical use of steroid / FDC preparations, poor patient compliance due to high cost of treatment and changing dress sense not suitable to our environment are the chief reasons.

Atypical clinical presentations, multiple site involvement, familial clustering and recurrence of cases have been noted in our study.

**Funding:** None.

**Ethical Approval:** The study was approved by the Institutional Ethics committee.

**Conflict of Interest:** None.

### References

1. Alshawa K, Beretti JL, Lacroix C, Feuilhade M, Dauphin B, Quesne G, et al. Successful identification of clinical dermatophytes and Neoscytalidium species by matrix-assisted laser desorption ionization-time of flight mass spectrometry. *J Clin Microbiol* 2012;50(7):2277–2281. doi: 10.1128/JCM.06634-11.
2. Havlickova B, Czaika VA, Friedrich M. Epidemiological trends in skin mycoses worldwide. *Mycoses* 2008;51(4):2–15. doi: 10.1111/j.1439-0507.2008.01606.
3. Mishra M, Mishra S, Singh PC, Mishra BC. Clinico-mycological profile of superficial mycoses. *Indian J Dermatol Venereol Leprol* 1998; 64:283-285

4. Sen S.S., ES Raul. Study in Dermatophytosis in Assam. *Indian J Med Microbiol* 2006;24;77-78
5. Bokhari MA. Study of onychomycosis. *Int J Dermatol* 1999; 38:591-595.
6. Huda MM, Chakraborty N, Bordoloi JNS. A clinico-mycological study of superficial mycoses in upper Assam. *Indian J Dermatol Venereol Leprol* 1995;61:329-332
7. Karmakar S, Kalla G, Joshi KR. Dermatophytosis in a desert district of Western Rajasthan. *Indian J Dermatol Venereol Leprol* 1995;61:280-283.
8. Bindu V, Pavithran K. Clinico-mycological study of dermatophytosis in Calicut. *Indian J Dermatol Venereol Leprol* 2002;68:259-261
9. Grover S. Study of onychomycosis in Bangalore. *Indian J Dermatol Venereol Leprol* 2003;69:284-286
10. Singh S, Beena PM. Profile of dermatophyte infections in Baroda. *Indian J Dermatol Venereol Leprol* 2003;69:281-283.
11. Sahin I, Kaya D, Parlak AH, Oksuz S, Behcet M. Dermatophytoses in forestry workers and farmers. *Mycoses* 2005;48(4):260-264.
12. Verma S, B Vasani, R. Male genital dermatophytosis—clinical features and the effects of the misuse of topical steroids and steroid combinations—an alarming problem in India. *Mycoses* 2016;59:606-614
13. Verma S, Madhu R. The great Indian epidemic of superficial dermatophytosis: an appraisal. *Indian J Dermatol* 2017;62:227-236.
14. Bishnoi, A. Vinay, K et al; Emergence of recalcitrant dermatophytosis in India: The lancet infectious diseases. 2018;18:250-251
15. Sardari L, Sambhashiva RR, dandapani R. Clinico mycological study of dermatophytes in a coastal area. *Indian Dermatol Venereol Leprol* 1983;49:2:71-75
16. Verma BS, Vaishnav VP, Bhat RP. A study of dermatophytosis. *Indian J Dermatol Venereol Leprol* 1970;36:182.
17. Peerapur BV, Inamdar AC, Pushpa PV, Srikanth B. ClinicoMycological Study of Dermatophytosis in Bijapur. *Indian J Dermatol Venereol Leprol* 2004;22:273
18. Singh S, Beena PM. Profile of dermatophyte infections in Baroda. *Indian J Dermatol Venereol Leprol* 2003; 69:281-283.
19. Nada H, Allah SS, Mokhtar M. Yeast infections as a cause of nail disease in the Western province of Saudi Arabia. *Egypt J Med Lab Sci* 2005;14:2.
20. Yadav. A, Urhekar AD, Mane. V et al. Optimization and Isolation of Dermatophytes from Clinical Samples and In Vitro Antifungal Susceptibility Testing By Disc Diffusion Method. Research and Reviews: *J Microbiol Biotechnol* 2013;2:1-39.
21. Karmakar S, Kalla G, Joshi KR. Dermatophytosis in a desert district of Western Rajasthan. *Indian J Dermatol Venereol Leprol* 1995;61:280-283.

**How to cite this article:** Kumar U, Chauhan MPS, Varma K, A clinico epidemiological study of dermatophytosis in a tertiary care center, Ujjain. *Indian J Clin Exp Dermatol* 2019;5(1):89-92