

EPIDEMIOLOGICAL TREND IN SUPERFICIAL FUNGAL INFECTIONS AT A TERTIARY CENTRE IN WESTERN UTTAR PRADESH, INDIA

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ABSTRACT

BACKGROUND

It is an indisputable fact that there is an increase in the prevalence of dermatophytosis over the past 4 - 5 years across the country (Prevalence rate= 27.6% in India and 29.6% outside India).^{1,2,3} However, the current perception among practicing Indian Dermatologists is that among outpatients there is a huge change in clinical profile, both qualitative and quantitative.¹

The study was aimed at studying different epidemiological factors, which influence or are likely to influence superficial fungal infections.

MATERIALS AND METHODS

This was a descriptive study. Patients with suspected dermatophytoses attending the Dermatology Department of SRMS Hospital, Bareilly were enrolled in the study. A detailed history, clinical examination and sample collection for mycological examinations were done.

RESULTS

Out of 600 patients screened, 150 patients were finally enrolled who fulfilled all inclusion criteria and exclusion criteria.

CONCLUSION

Our study is a comparative analysis with studies done in other parts of the country to the trends in Western Uttar Pradesh and Uttarakhand on dermatophytosis and superficial fungal infection. Subjects in the age group 21-30 years, service personnel and subjects from upper socio-economic status were more predisposed to superficial fungal infections.

KEY WORDS

Dermatophytosis, Epidemiology, Fungal Infection.

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BACKGROUND

Dermatophytoses have always been among the commonest infective dermatoses in India. A disease that was taken for granted and is now becoming a cause of anxiety and trepidation for the dermatologist.⁴ Among all the superficial fungal infections, dermatophytic infections have the highest prevalence in the developing countries with significant associated morbidity.⁵ Only under exceptional circumstances do they survive or proliferate in the deeper tissues of the body.⁶ It is impossible to tell how much of this widely perceived change is the product of primarily the host, agent, environmental or pharmacological factors and how much of it secondary to a change in health-seeking behaviour of the Indian patient.

There is a dire need for well-designed studies as well as more solid evidence for various issues pertaining to the dermatophytosis scenario in India.⁷ Comparison of studies done on superficial fungal infections in cities such as Kolkata, Ahmedabad and Chennai during different timeframes have revealed an increasing trend of dermatophytosis.^{8,9,10,11,12,13}

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MATERIALS AND METHODS

This descriptive study was carried out in the Dermatology Department of a Medical College in the Rohilkhand region, which caters to the population from as far as Nepal.

A total of 600 patients were screened among the outpatients at the Dermatology Department of SRMS IMS, Bareilly from 1st January 2016 to 30th December 2016. The screening was done of patients who had a lesion with central clearing with advancing red, scaly, elevated border which may result in vesicles on the border of the affected area. Out of which 312 were found to be KOH positive cases, out of the 312 KOH positive cases 110 cases were not fulfilling inclusion criteria, 46 cases refused consent and 6 cases were of hyperhidrosis. Finally, 150 cases were enrolled in the study.

Inclusion Criteria

1. Clinically diagnosed case of dermatophytic infection.
2. Only KOH positive cases showing septate fungal hyphae will be selected.
3. Age \geq 18 years and $<$ 65 years (M).
4. Patient should be willing to give all socio-demographic information.

Exclusion Criteria

1. Uncooperative patients.
2. Patients with any type of malignancy.

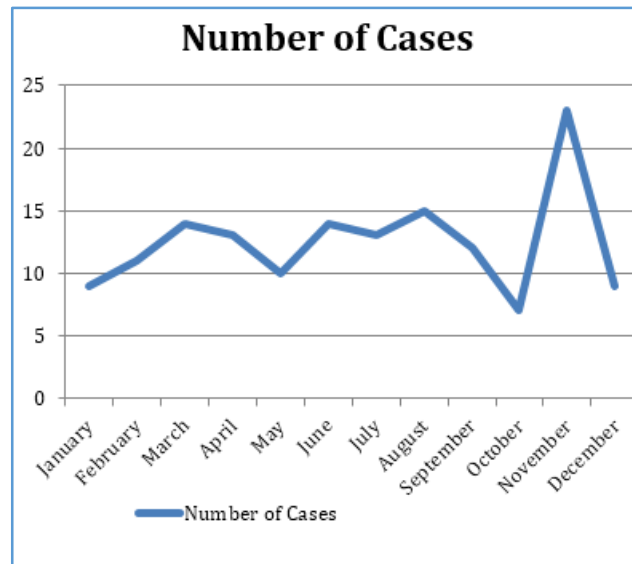
IRB approval was taken and patients were included in the study after an informed and written consent.



Figure 1. Non-Infected Site



Figure 2. Infected Site



The highest incidence was in the month of November (23) followed by August (15) month.

Sl. No.	Age-Group (in Years)	Numbers	%
1	18-20 yrs.	41	27.33
2	21-30 yrs.	65	43.33
3	31-40 yrs.	31	20.67
4	41-50 yrs.	9	6
5	51-60 yrs.	3	2
6	61-65 yrs.	1	0.67
Total (n= 150)		150	100%

Table 1. Age Profile

Mean 27.79, Std. Dev. 9.59.

Most cases were in the Age Group of 21-30 years of age and least were in the Age Group of 61-70 years.

RESULTS

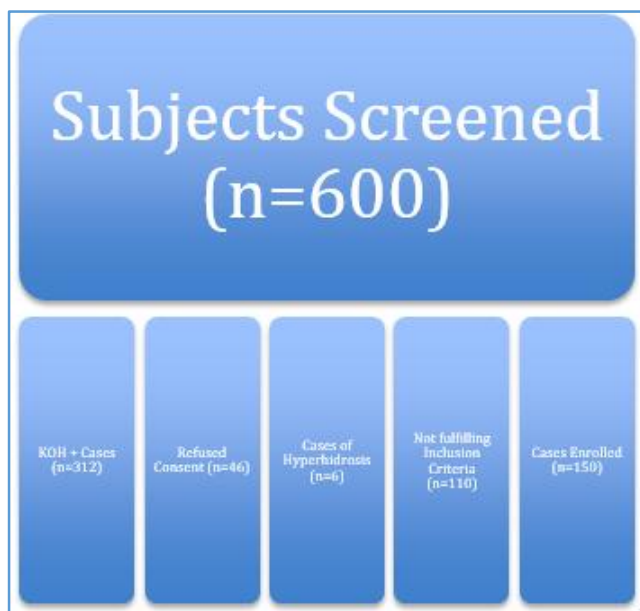


Figure 3. Monthly Prevalence

Gender	No.	%
Male	147	98
Female	3	2

Table 2. Gender Profile

Most of the cases were Male (98%) and 2% were Female.

Marital Status	No.	%
Married	70	46.67
Unmarried	80	53.33

Table 3. Marital Status

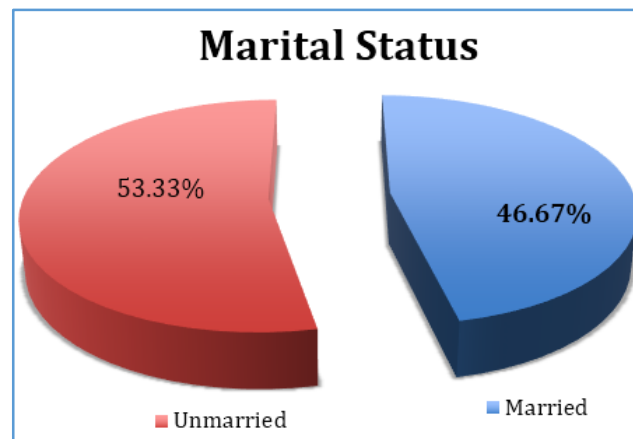


Figure 4

Among individuals, 46.67% were married and unmarried were (53.33%).

	Present	Absent
Number of Patients	65	85
% of Cases	43.55%	56.55%

Table 4. Family History

Most number of the cases (56.55%) had no family history, while 43.55% of cases had positive family history.

Sl. No.	Parameter	Mean ± S.D.	Maximum (°C)	Minimum (°C)
1.	Temperature (°C)	26.19±5.64	39	12.05
2.	Humidity (%)	56.36±27.69	88.28	27

Table 5. Weather Profile* (Indian Meteorological Department Data)

As per IMD Data, Mean Temperature was 26.19 and Mean Humidity was 56.36 during the study period at Bareilly.

	Total Cases	Percentage
Service	38	25.33%
Student	37	24.67%
Labour	32	21.33%
Semi-Skilled	25	16.67%
Business	17	11.33%
Unemployed	1	0.67%
Total	150	100%

Table 6. Job Profile

Most of the cases were Service men (25.33%), then were the Students (24.67%) and least were Unemployed (0.67%).

Sl. No.	Parameters	Mean ± S.D.	Maximum	Minimum
1	Height (centimetres)	168.39±7.29	185	146
2	Weight (kgs)	62.69±11.66	108	42
3	Body Mass Index (BMI)*	22.06±3.63	33.7	15.57

Table 7. Anthropometric Profile

Mean Height and Mean Weight were 163.39 +/- 7.29 and 62.69 +/- 11.66 respectively. Maximum participants had BMI in the range of 19-25. *BMI was calculated as Weight/Height². Weight was taken in Kilograms and Height in Metres.

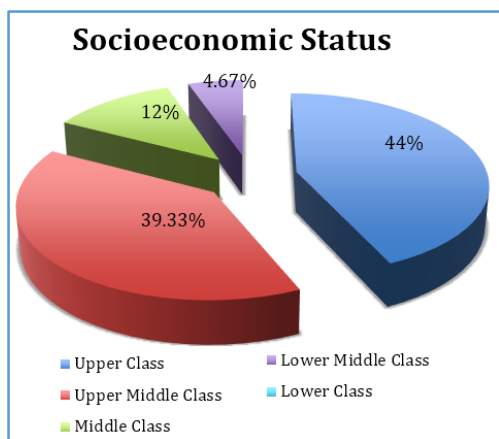


Figure 5. Socioeconomic Status

- As per Revised Modified BG Prasad Socioeconomic Scale.
- Most participants were in the Upper Class; Upper Class criteria was monthly per capita income more than Rs. 6346.
- There were no cases from the lower class (Monthly per capita income less than Rs. 951).

Sl. No.	Level of Education	No.	%
1	Postgraduate and above	15	10
2	Graduate	49	32.67
3	Attended School	72	48
4	Uneducated	14	9.33
	Total	150	100%

Table 8. Education Profile

Maximum number of participants (72) attended at least school and least number (14) were uneducated.

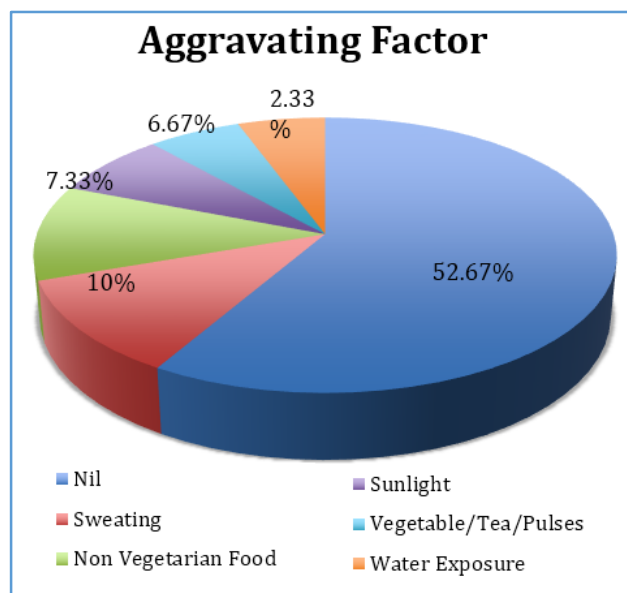


Figure 6. Common Aggravating Factors

Majority of patients (52.67%) had no aggravating factor and least (2.33%) had water exposure as aggravating factor.

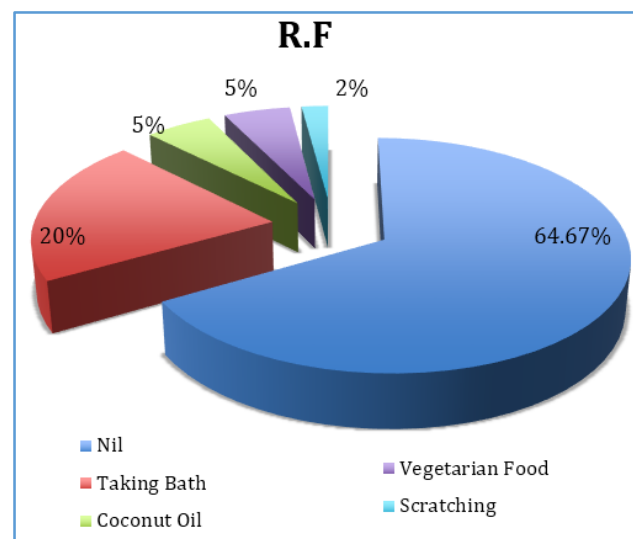


Figure 7. Common Relieving Factors

	Vegetarian	Non-Vegetarian
Number of cases	80	70
Percentage of cases	53.6%	46.4%

Table 9. Food Habits

Maximum number (53.6%) of cases were Vegetarian and least number (46.4%) were Non-Vegetarian.

	Number of Cases	Percentage of Cases
Topical Steroid	38	25.46%
Systemic Steroid	15	10%

Table 10. Steroid Application Profile

25.46% of cases had history of topical steroid application, whereas only 10% of cases had taken systemic steroids.

DISCUSSION

In past studies, it has been observed that axilla and groin are the most commonly affected sites due to increased sweat production and occlusive morphology of the location.

The distribution, frequency and aetiological agents of dermatophytosis vary according to the geographic region studied, the climatic variations, the socioeconomic level of the population, the time of study, the presence of domestic animals and age of the individual has already been proven.¹⁴

In our study which included factors like Age, Sex, Residence, Aggravating factors, Relieving factors and Outside treatment history along with any associated disease was a very vast study, which included all possible parameters including BMI and weather.

The clear-cut peaks of Dermatophytosis in the present study are in the months of November and August, whereas in a previous study on Dermatophytosis in Munich.¹⁵ The clear-cut peaks were in the months of January and September. In a previous study on superficial dermatophytoses in Asia done by KJ Rhim and JH Kim in 1978, it was found that 'the age group of 20 - 29 years shows the highest incidence.'¹⁶

Most participants in the present study were of the age group 21 - 30 years and constituted 42.67% of total cases followed by the 10 - 20 years' age group, which consisted only of adults above 18 years of age. Such individuals were 41 out of total of 150 cases constituting 27.33% of participants. These findings are consistent with the findings of KJ Rhim and JH Kim followed by 31 - 40 years' age group, which had 20.67% of total participants, 41 - 50 years' age group had 6% participants and 51 - 60 years' age group and 61 - 70 years' age group having only 2% and 1.33% participants respectively. Majority of past studies from India have reported a preponderance of patients aged < 40 years.^{2,3,7,12,17-19}

The probable reason for higher prevalence in this group could be that the individuals in this group are often most active because of their involvement in the outdoor activities such as studies, jobs etc.¹⁸

The study had 98% of cases as Males in comparison to Females, who constituted only 2% of cases. This disparity was largely due to reluctance of Female patients to participate in the study, as the principal investigator was a male postgraduate student and females were not willing to let examination of their groin and axilla. Such females were excluded from the study as per exclusion criterion.

Fungal infections are relatively less common in women. This may be explained by them being relatively less exposed to an environment conducive to the spread of organisms.

In past studies from India done on the topic of dermatophytosis, males outnumbered females^{8,12} to the tune of males comprising 85.1% of total patients in one study by Bhatia et al.¹⁸ This may be due to the differences in occupational exposure of both the sexes, as males are more involved in construction and other works.¹⁸ Exception to this finding was a study done in North India, where the Male: Female ratio was found to be 1: 1.¹⁹

Past studies have shown a significant difference in alpha diversity between men and women on virtually all body sites including palm.²⁰ In this study positive family history was seen in 43.55% of cases, which is rather low compared to a previous study in Eastern India where positive family history was seen in 83.84% cases.⁵

Most of the cases enrolled were from India, but 5 cases were from Nepal as it is neighbouring the Rohilkhand region. Among Indian cases, 135 were from Uttar Pradesh constituting 90% of all participants and rest 10 cases (6.67%) were from Uttarakhand. Majority of patients were from a rural background (55.33%) and urban patients were only 44.67% of all. These findings are similar to those reported by Lavanya et al, who reported 54% of their study patients belonging to a rural background.¹⁷ This is in contrast to a past study by Gupta et al, where majority of patients were from the urban background as their study institute was located in a city.¹⁹

Our institute caters to a predominant rural population and hence majority of patients hailed from a rural background in the present study. The relatively increased incidence in rural populations may be due to a low standard of health education, overcrowding, poor hygiene and close personal and animal contact.²¹ The relatively different outdoor and indoor occupations in rural and urban background respectively may alter skin conditions, hence the bacteria that reside there.²⁰

In this study, maximum number of patients were either service going or student classed. This is similar to the past study done by Monika et al, where maximum were service class or were students.¹⁹ On the contrary in a previous study done in Tamilnadu, maximum number of participants were manual labourers (54.50%).²²

The patients with a history of topical steroid application were 38, probably the number could be higher as most of the patients did not know what they had applied or what they had taken orally. In the study done by Dash et al, treatment by past application of topical steroids and mixed cream was seen in 121 (61.11%) patients.⁵ In a previous study by Dutta et al, pharmacists were responsible for 78% of tinea incognito cases, and betamethasone dipropionate was the most common drug used.²³ Sweating (10%) was the most common aggravating factor and taking bath (20%) was the most common relieving factor.

CONCLUSION

Our study is a comparative analysis with studies done in other parts of the country to the trends in Western Uttar Pradesh and Uttarakhand on dermatophytosis and superficial fungal infection.

The Impact of age, Living conditions, Weather, BMI and personal factors on susceptibility to and duration of Dermatophytic/Superficial fungal infections was elucidated in India's most populous state.²⁴

Subjects in the age group 21-30 years, service personnel and subjects from upper socio-economic status were more predisposed to superficial fungal infections.

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