Research Article

Clinico-mycological study of Dermatophytosis at a tertiary medical center of Uttar Pradesh

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Abstract

Background: Now day's number of dermatophyte infection in general population is increasing. It is generally known as Tinea corporis, Tinea cruris, Tinea faciei etc. **Material and Methods:** A prospective study was done to know the current clinical status of dermatophytic infection in patients attending the outpatient department of skin at a tertiary medical center. Mycological study of skin scraping was done in department of Microbiology.The data was interpreted by statics. **Result:** In the present study, most common age group affected 21-30 years with 37.90%. Male to female ratio was 4.7:1. Dermatophytoses infection was found to be higher among manual worker (40.1%) and in lower middle class (52% cases). Tinea corporis and Tinea cruris were the most common clinical type (48%). KOH positivity was seen in78.8% of cases. **Conclusion:** Dermatophyte infection is quite prevalent now days. It is more in middle age group with male preponderance. It is more commonly seen in lower middle class and mostly in manual workers. Tinea corporis et cruris is the commonest presentation.

Key words: Dermatophytes, Tinea corporis, Tinea cruris, Tinea faciei, Tinea unguium.

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Introduction

Superficial fungal infections are the most common skin disease affecting millions of people throughout the world. The majority of these infections are caused by **dermatophytes** [1]. **Dermatophytes** are a group of closely related keratinophilic fungi, all of which produce keratinase that can invade the stratum corneum of skin or other keratinized tissues derived from epidermis such as hair and nails.

Dermatophytesis an infection produced by a dermatophytic fungus in the keratinized tissues - hair, nails and stratum corneum of skin[1]. Dermatophytosis is generally called **"tinea"** or **"ringworm".** Tinea is Latin for 'larva of small insect'.

The common clinical term given to dermatophytosis is designated by appending Latin word to an anatomical site at which infection is present to the term tinea. The distribution of different species of dermatophytes varies markedly form one ecological niche to another depending on their primary natural habitat. Certain species of dermatophytes are geographically restricted and endimic only in particular parts of world while some species are sporadic but worldwide in distribution [1].

The prevalence of dermatophytosis is governed by environmental conditions, personal hygiene and individual susceptibility from place to place [2].

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Material and Methods

Study site: This prospective study was conducted in the Department of Dermatology and Microbiology, HIMS, Safedabad, Barabanki, U.P.

Study Population: The study was conducted on samples of skin scrapping, nail, hair and hair roots received to the laboratory.

Study Design: Prospective study.

Sample Size: In a previous study by Mahale et al (2014), of the 177 samples, 115 (65%) were KOH positive. At 95% confidence level and 80% power the formula for calculation of sample for an exploratory study is:

$n = \frac{p(1-p)}{e^2} \times 4$

where "p" is the prevalence (i.e. 65%), while e^2 is the allowed error (taken as 6%)
The sample size was 253.

Study Duration: The study was conducted over a period of one year

Inclusion criteria

- Patients >18 years of age.
- Samples of skin scrapping, nail, hair and hair roots were included

Exclusion criteria

- Patients on antifungal and immuno-suppressivetherapy

Methodology

Specimen Collection- The affected area or lesions was wiped with 70% alcohol. The specimen includes skin scales, hair, hair roots, nail clippings and scraping beneath the nails. Samples were collected in clean black paper packets.

Skin specimen- Skin specimens were collected by scrapping across the inflamed margin of lesion into the apparently healthy tissue using a curved disposable scalpel blade.

Nail specimen- Clippings were taken from the affected nails using nail clipper. Friable material beneath the nail was also taken by scrapping with disposable scalpel blade.

Hair specimen- Base of the infected hair shaft around the follicle was taken by plucking with epilating forceps.

Specimen processing- Specimens collected were subjected to standard mycological procedures.

Direct Microscopic Examination KOH wet mount- This was prepared by placing portion of each sample collected (skin scales, hair, hair roots, nail clippings and scraping beneath the nails) on a clean, grease free, microscope glass slide.

Then 1-2 drops of 10% KOH for the skin and hair sample while 20% or 40% KOH was applied for nail samples. Sample and KOH was mixed well and a clean cover slip is placed over it, and the slide was gently heated. The slide was allowed to cool and "ripen" a few minutes before examination under bright field microscope under low (XI0) and high (X40) magnification.

The slide was then screened for presence of **fungal hyphae** which stands out as highly refractile, long undulating, and branched, septate threads or for the presence of **arthroconidia** which are fragmentation of densely septate hyphae appearing as rectangular or barrel shaped cells.

Results

In the present study, 354 clinically diagnosed and KOH positive cases of dermatophytoses attending Skin and venereal disease outpatient Department of HIMS. Barabanki were Studies.

Myccological examination was done in department of Microbiology.

In the present study, most common age group affected 21-30 years with 37.90% followed by less than 20 years (21.2%), 31-40 years (18.9%).

Overall, most of the cases of dermatophytoses are in 21-60 years age group while it is least common at extremes of age [Table-1]. Males (81.4%) were more affected than females (18.6%).

Male to female ratio was 4.7:1. The higher percentage of males might be due that female much lower enrolled in this study [Table-2].

Table-1: Age distribution of patients

Age in years	No. (n=354)	%
≤ 20	75	21.2
21-30	134	37.9
31-40	67	18.9
41-50	45	12.7
51-60	24	6.8
>60	9	2.5
Mean± SD (Range)	31.97±12.92 (19-75)	

Table-1 shows the age distribution of patients. More than one third of the patients were between 21-30 (37.9%) years.

Table-2: Gender distribution of patients

Gender	No (n=354)	%
Male	288	81.4
Female	66	18.6

Table-2 shows the gender distribution of patients. Majority of the patients were males (81.4%).

Table-3: Distribution of patients according to occupation

Occupation	No. (n=354)	%
Manal worker	142	40.1
House wife	112	31.6
Student	41	11.6
Professional	26	7.3
Others	33	9.3

Table- 3 shows the distribution of patients according to occupation. More than one third of the patients were manual worker (40.1%).

Overall dermatophytoses was most common in manual worker (40.1% cases) followed by student (31.6% cases) house wife (11.6% cases) other (9.3% cases) and professional (7.3% cases).

Table-4: Distribution of patients according to Socio-Economic Status

SES	No. (n=354)	%
Lower class	122	34.5
Lower middle class	184	52.0
Middle class	39	11.0
Upper middle class	9	2.5

A total of 354 clinically diagnosed cases of dermatophytosis were studies majority of the case were from lower middle class (52% cases) followed by lower class (34.5% cases) & middle class (25% cases) upper middle class was least affected with 2.5% cases respectively.

Table-5: Distribution of patients according to clinical type.

Clinical type	No. (n=354)	%
Dermatophytosis erythoderma	1	0.3
Eatemsive dermatophytosis	3	0.8
P. psoriasis Nail	2	0.6
T. Barbae	2	0.6
T. Barbae+T.cruris	2	0.6
T. capitis	3	0.8
T.corporis	16	4.5
T. corporis+T.cruris	170	48.0
T. corporis+Tcruris+T.Faciei	20	5.6
T. corporis+T.padis	3	0.8
T. cruris	90	25.4
T. cruris+Dermatitis	1	0.3
T. Faciei	5	1.4
T. Faciei+T.cruris	7	2.0
T. Gladiatorum	4	1.1
T. Incognito	2	0.6
T. Manuum	2	0.6
T. Pedis	9	2.5
T. Manuum+T.pedis	1	0.3
T. Mcognto	1	0.3
T. Unguium	8	2.3
T. Unguium+T.Manuum	1	0.3
T. Carbae+T.corporis+T.cruris	1	0.3

Table-5 shows the distribution of patients according to clinical type. T.corporis+T.cruris was the most common clinical type (48%) T.cruris (25.4%) was the second most common clinical type.

Table-6: Distribution of patients according to Dermatophytoses infection.

KOH test	No. (n=354)	%
Positive	279	78.8
Negative	75	21.2

Table-6 shows the distribution of patients according to Dermatophytoses infection. Dermatophytoses infection was found to be 78.8%.

Dermatophytoses infection was found to be higher among manual worker (40.1%) than house wife (31.6%), student (11.6%), professional and others [Table-3]. Dermatophytoses infection was found to be higher among lower middle class (52% cases) followed by lower class (34.5% cases) & middle class (25% cases) upper middle class was least affected with 2.5% cases respectively [Table-4]. T.corporis+T.crurits (48%) were the most common clinical type [Table-5]. The samples of all clinically diagnosed cases of dermatophytosis were sent to microbiology department where KOH mount was done. The wet mounts were seen under microscope. Fungal hyphae were seen in only 78.8% of cases [Table-6]. Rests of specimens were negative for KOH.

Discussion

Dermatophytoses are superficial infections of keratinized tissue, the skin, hair and nails, caused by dermatophytoses. The prevalence of dermatophytosis is determined by environmental condition, personal hygiene and individual's susceptibility. The variation in clinical presentation is related to the species of the fungus, size of the inoculums, in the involved sites, and the immune status of the host. The higher incidence of superficial mycoses is seen in month of July to September due to rainy season & humid atmosphere.

Age distribution- Most of the studies from different parts of India reported commonest age- group affected to be 21-30 years [3-7].

The present study was correlated with other studies done by Aurangabad, at Bijapur, at Assam, at Mangalor and at Jammu and Kashmir [8,9,10] . High infection of dermatophytosis in this age group (21-60years) might be due to increased physical activity, high chances of exposure and hormonal factors.

Gender distribution- In our study there was male preponderance. Other studies have reported similar observations [8,9,11]. Male preponderance might be due to more involvement of them in physical and outdoor activities thereby increasing chance of exposure. Male: Female ratio of 4.7:1 (higher as compared to other studies), may be due to increasing involvement of females nowadays in outdoor activities and increasing health awareness among them.

Occupational status- Manual workers were affected more by dermatophytosis in our study. This was in agreement to the study done by Veer et al [10]. This may be due to more involvement of manual workers in physical activities and thereby increased chance of exposure [12].

Socio-economic status- Patients from lower socio-economic status were affected more than other in this study. This may be due to poor hygienic conditions, overcrowding, sharing of linen , towels, poor nutrition [13] .

Distribution in relation to clinical types- Tinea corpories was the most common clinical type in the study and it was comparable with other study which were done in the past [9,11,14,15]. In the present study, T.cruris (25.4)% was second most common clinical type. This is comparable to the studies [9,15,16].

In the present study, T.corporis+T.Faciei (5.6%) were third most common clinical type. The findings of this study was in agreement with other studies at Mangalore (6% cases), at Vijaywada [10,17].

Mycological Study by KOH- This indicates that KOH is only a sensitive and screening test not a specific test to diagnose dermatophytes.

Conclusion

The present study shows that dermatophytoses infection was found to be higher in the middle age group and was least in the extreme of age. Dermatophytoses infection was found to be higher in males than females. T.corporis+T.cruris were the most common clinical type. T. cruris was the second most common clinical type. Dermatophytoses infection was found to be higher among lower middle class. Dermatophytoses infection was found to be higher among manual worker. KOH is most common test for rapid confirmation of dermatophytes but it is less specific. Dermatphytoses are quite common in India because of hot and humid climate the poor hygienic conditions, both playing important role in growth of these fungi. There is varying difference in isolation of different species of dermatophytes from different regions of India.

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