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Clinico-Mycological Profile of Dermatophytosis in Sharda Hospital, Greater Noida

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Abstract: Fungal infections are very common in man. Dermatophytoses is worldwide in distribution; however, it is more prevalent in tropical countries due to relatively high humidity and temperature**.** This study was conducted to rule out the clinical forms and etiology of dermatophytoses. Skin scrapings, nail clipping and infected hair stubs from the suspected cases were screened from clinically suspected cases were collected as per standard protocol. Specimens were examined in 10% KOH mount kept at room temperature for a suitable period. Cultures were done using SDA and DTM. Dermatophytes were isolated and identified by standard mycological methods. Out of 135 clinically infected cases, 62.96% and 37.03% were male and female respectively. Dermatophytoses was highly prevalent in the age group 16 to 30. Among all clinical types T.cruris was most predominant followed by T.corporis and T.*unguium*. In KOH examination,Fungal hyphae were seen in 89 samples. And out of 89 KOH positive samples, only 16 samples were positive by culture. Here 9 species of Epidermophyton *floccosum*, 4 species of Tricophyton, and 3 species of Microsporum were isolated. Most prevalent dermatophytic fungi is Epidermophyton. Dermatophytosis is more common in male than the female. The maximum clinical manifestation is Tinea *cruris*.
Keywords: Dermatophytosis, Tinea *cruris*.

INTRODUCTION

Dermatophytosis is a superficial fungal infection on the skin, hair and nails [1]. It is one of the most common diseases around the world caused by dermatophytic fungal species of Trichophyton, Microsporum and Epidermophyton.

Dermatophytosis is common in tropical countries like India and may reach epidemic proportions in area with high rate of humidity and over population and poor hygienic conditions. Dermatophytic fungi can be identified in a laboratory on the basis of colonial morphology, spore production and nutritional requirements in vitro. Few reports on dermatophytosis are already available from different parts of our country e.g. Delhi, Punjab, North India, Central India, Varanasi, Sikkim, Jaipur and Pondicherry [2-9]. It is very clear from these reports that studies of one region of the country are not a true representation of the overall disease pattern in the country. There is no report on the prevalence of dermatophytosis in western Uttar pradesh especially in Greater Noida. This study was undertaken to throw more light on the various clinical forms and isolates causing dermatophytoses in Greater Noida.

MATERIALS AND METHODS

This cross sectional study was conducted in department of Microbiology in School of Medical Sciences and Research, Sharda University, Greater Noida over a period of a year from April 2014 to March 2015. In this study total 135 sample were collected from clinically suspected patients with dermatophytic infections.

Clinically suspected patients with dermatophytosis and patient who had given the consent were included in this study. While patients who had not given consent for the study were excluded.

As per the involvement of the anatomical site they were grouped into various clinical types. Various sample i.e. skin, nails and hairs were aseptically collected and processed according to standard protocol.

Collection of the sample

The first step of the sample collection process is through cleaning of the infected area with 70% ethanol to remove dirt and contaminants, then after drying, skin scraping were collected from the active edge of lesion with the help of sterilized blade on clean small black paper envelope. Black paper allows easy visualization of small skin. The samples were divided into 2 parts. First part of sample was used for direct microscopy and second part for culture. For hair plucking, sample was obtained by scrapping the scalp with blunt scalpel and sample included hair stubs and skin scales. For Nail clipping, sample was obtained by clipping of infected area of nail.

Examination of direct KOH mounts

For Microscopic examination 10% KOH was used for skin scrapping and hair samples while 40% KOH was used for nail clipping.

The specimen with 10% or 40% KOH was kept at room temperature in humid environment till the keratinized tissue was dissolved. The KOH wet mount were screened under low power (X10) and then at high power (X40) for visualization of the fungal hyphae [10].

Isolation and Identification of dermatophytes

Second part of the sample was inoculated on two set of SDA containing chloramphenicol (0.05 mg/ml) and cyclohexamide (0.1-0.4 mg/ml) and incubatedat 25^0C and 37^0C. Samples were also inoculated in DTM. The culture was examined twice a week and if no growth was obtained till 4 weeks they were declared negative. The culture isolates were further identified by standard mycological technique on the basis of colony morphology on SDA, pigmentation, color changes of DTM and microscopic examination of lacto-phenol-cotton blue mounts (LPCB). Further special test like slide culture and hair perforation test were performed wherever necessary according to standard technique [10].

RESULTS

This study was conducted over a period of 1year and total of 135 clinical samples were collected from dermatophytosis. Data were analyzed for distribution of sex and age. Positivity pattern of fungal hyphae was analysed by KOH mount and fungal culture.

The details regarding clinical manifestation and sex are given in the table 1. In this table male members were affected more than the female 85/135(62.96%) however the difference is statistically not significant (P = 0.07as calculated by chi- squire test). Clinical manifestation in relation to age showed in table 2. In age group 0-15 year T. *capitis* 3/7(42.85%), 16-30 year T. *cruris* 33/65(5076%), 31-45year T. *cruris* 16/47(34.04%) and>45 years T. *cruris* 5/25(20%) were most common condition. Microbiological observation revealed the presence of fungal hyphae by KOH mount in 89/135 (65.92%) cases. Fig 1 showed the positive pattern of fungal hyphae in various clinical conditions. Distribution of dermatophytic fungi acoording to clinical manifestation has mentioned in table 3.

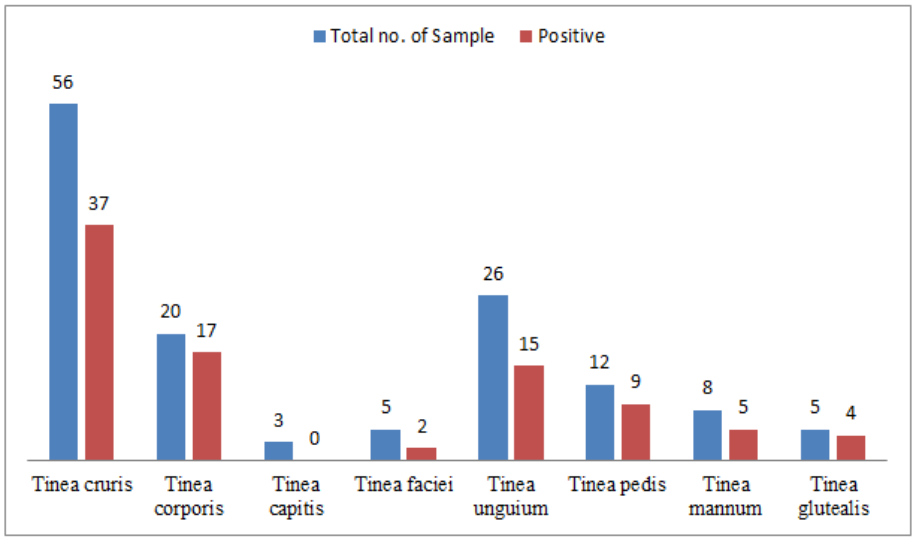

Fig-1: Positivity pattern of fungal hyphae by KOH mount

Table-1: Details of samples with reference to clinical manifestation and sex

Clinical Types	Total No of Samples (%)	Sex	
		Male	Female
		Total No (%)	Total No (%)
Tinea cruris	56(41.48)	45(80.35)	11(19.64)
Tinea corporis	20(14.81)	8(40)	12(60)
Tinea capitis	3(2.22)	2(66.66)	1(33.33)
Tinea faciei	5(3.70)	4((80)	1(20)
Tinea unguium	26(19.25)	12(46.15)	14(53.84)
Tinea pedis	12(8.88)	7(58.33)	5(41.66)
Tinea mannum	8(5.92)	6(75)	2(25)
Tinea glutealis	5(3.70)	1(20)	4(80)
Total	135 (100)	85(62.96)	50(37.03)

Table-2: Dermatophytosis with reference to clinical manifestation versus age group

Clinical Manifestation	Total no. of sample n(%)	Age Group			
		0-15 n(%)	16-30 n(%)	31-45 n(%)	> 45 n(%)
Tinea cruris	56(41.48)	2(3.57)	33(58.92)	16(28.57)	5(8.92)
Tinea corporis	20(14.81)	0	8(40)	10(50)	2(10)
Tinea capitis	3(2.22)	3(100)	0	0	0
Tinea faciei	5(3.70)	0	3(60)	2(40)	0
Tinea unguium	26(19.25)	2(7.69)	10(38.46)	11(42.30)	3(11.53)
Tinea pedis	12(8.88)	0	4(33.33)	5(41.66)	3(25)
Tinea mannum	8(5.92)	0	4(50)	2(25)	2(25)
Tinea glutealis	5(3.70)	0	3(60)	1(20)	1(20)
Total	135(100)	7(5.18)	65(48.14)	47(34.81)	16(11.85)

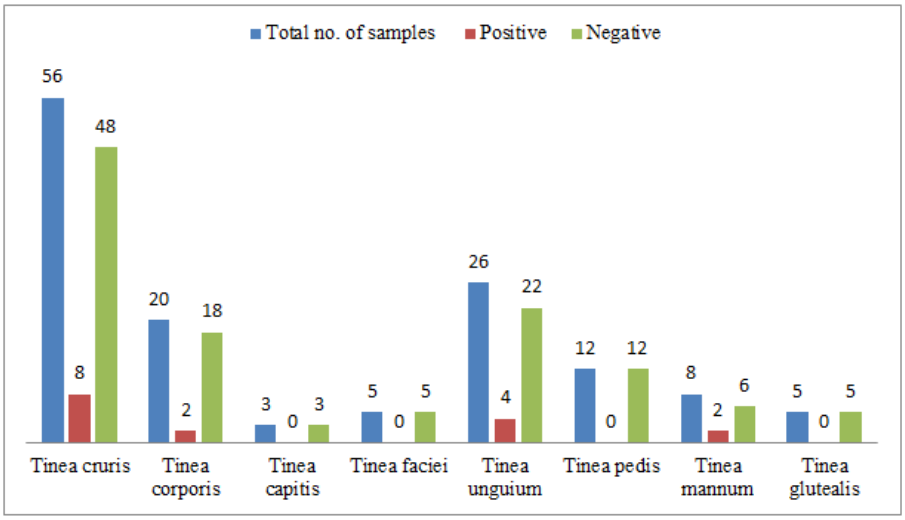

Fig-2: Positivity pattern of fungal hyphae by culture

Table-3: Prevalence pattern of dermatophytic fungi

Clinical Manifestation	Total No. of samples & %	Dermatophytic fungi		
		Trichophyton	Microsporum	Epidermophyton
Tinea cruris	56(41.48)	3(5.35)	2(3.57)	4(7.14)
Tinea corporis	20(14.81)	0	1(5.0)	2(10.0)
Tinea capitis	3(2.22)	0	0	0
Tinea faciei	5(3.70)	0	0	0
Tinea unguium	26(19.25)	1(3.84)	0	2(7.69)
Tinea pedis	12(8.88)	0	0	0
Tinea mannum	8(5.92)	0	0	1(12.5)

Tinea glutealis	5(3.70)	0	0	0
Total	135(100.0)	4(2.96)	3(2.22)	9(6.66)

DISCUSSION

Dermatophytosis is by far the most common fungal infections in humans and is caused by a group of keratinophillic filamentous fungi with marked affinity for keratinized tissue of skin, hair and nail. Climatic conditions like high temperature and humidity have been found to be increasing factors responsible for the high prevalence of the disease [11-13].

It was observed dermatophytoses was highly prevalent in the age group 16 to 30 years as well as 31 to 45 similar to other studies which accounted for 81.13% and 91% [14,15].

Male was predominantly affected by dermatophytes that can be explained by the fact that this group of patients are highly active and take part in majority of outdoor activities, which enhance the chances to acquire infection from increased environmental exposure. Lack of hygiene and overcrowding are also some of the factors responsible for dermatophytic infection.

In the present study T.*cruris* was the most common infection in male (52.94%) followed by T.*unguium* (14.11%), T.*corporis* (9.41%) and T.*glutealis* (1.17%). In females most common infection was T.*unguium* (28%), followed by T.*corporis* (24%), T.*cruris* (22%), T. *pedis* (10%), T.*glutealis* (8%), T.*mannum* (4%), T.*capitis* and T. *faciei* (2%).

Nagarkatti PS *et al*. reported T.cruris as most common clinical type followed by T. corporis and T. capitis [9]. Tinea cruris is an itchy, red rash in the groin and surrounding area. In our study it is more common in young men which are in consistent with reports from other regions of the country. However it is reported from the regions where climate is is warm in most part of the year in contract to Greater Noida where climate is cold to warm.

A study from Tiruchirappalli reported most common manifestation was Tinea corporis followed by Tinea cruris, Tinea capitis and Tinea unguium[16]. Tinea corporis was the second predominant clinical manifestation in our study. While in Jaipur [17] Tinea corporis was found to be the most common clinical manifestation. This affects the trunk and exposed areas like the abdomen or limbs, causing red patches. It is more common in adult than in children and occurs most frequently in hot and humid climate [18]. A study from New Delhi conduced exclusively on pediatric patients has demonstrates that Tinea *capitis* is a common condition in Pediatric age group [2]. In our study we find only seven patient from pediatric age group. It may be reason we could not found any case of Tinea *capitis*. We reported incidence of Tinea *pedis* 8.88% in our study. Occurence of *T. pedis* was relatively similar to a study from Jaipur [17]. Tinea *unguium* consitituted 19.25% cases. which is higher finding as compared to previous studies conducted in Tiruchirappalli and Shimla[16,19].

In this study total nine species of Epidermophyton *floccosum*, four species of Tricophyton, two of which were Trycophyton *rubrum* and three species of Microsporum, two of which were Microsporum *gypsium*. Two samples negative by KOH revealed the growth of fungi one Tricophyton and one Microsporum *gypseum*. Fungi could be more commonly isolated in case of infection of Palmer aspect of the hand followed by infection in the finger webs and infection of groin. Sensitivity as calculated by culture was 11.85%.

In our study 89(65.92) samples were positive by KOH campared to Assam, Shimla,Jaipur Tiruchirappalli and Mumbai reported 49%, 59%, 73%,78% and 82% respectively[16,17,19-21]. In our study the culture positive rate in our study is 11.85% which is much lower than previous report ranging from 44.6% to70.7% [17-19]. It is obvious that in all these studies diagnosis was more frequently established by KOH examination compared to isolation of etiological agent. A number of samples negative by culture as well as KOH mount indicates that a significant number of skin lesion are clinically misdiagnosed as dermatophytosis[22,23].

The most common isolate in our study is Epidermophyton *flocossum* followed by Trichophyton *rubrum*. In a study from Assam most common isolate is Trichophyton *rubrum* followed by Trichophyton *mentagrophyte* and Epidermophyton *flocossum*. Trichophyton *rubrum* is the most common isolate in a study from Shimla [19]and Jaipur [17]. The common isolate from a study from New Delhi was Trichophyton *violaceum* followed by Tinea *rubrum*[2]. It appears that Tinea *rubrum* is a common but not the most common etiological agent in NCR. In our study we did not find significant difference in the rate of infection between males and females. In this study no fungal hyphae seen in KOH examinations and no dermatophytic fungus was grown in culture in all the 3 case of Tinea *capitis*, however in Tiruchirappalli where the prevalence of Tinea *capitis* was 16.6% [16]. A study from Jaipur has reported that Tinea *capitis* is the second most clinical manifestation [17].

CONCLUSION

Tinea *cruris* was the predominant clinical condition. In male T. *cruris* and in female T. *unguium* was common infection. Clinical manifestation in relation to age showed that patients with age group 16-30 years and 31-45 years were more affected. Routine screening and health education (counseling about using

clean clothes, taking bath, not sharing clothes, combs, caps) should go a long way in reducing the dermatophyte infection.

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