

“Clinicomycological study of Dermatophytosis in a tertiary care hospital”

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Abstract

Background: Dermatophytosis refers to superficial fungal infection of keratinized tissues caused by dermatophytes. Dermatophytes colonize only the cornified layer of epidermis or suprafollicular portions of hair and do not penetrate into deeper anatomical sites. Although Dermatophytosis is not debilitating or life threatening, it can be persistent, troublesome and are often confused with other skin disorders. So, laboratory investigations are essential for correct diagnosis, management and to minimize cost.

Objectives of Study: To isolate & speciate the dermatophytes & to analyze clinico-mycological profile of Dermatophytosis.

Materials and Methods: Samples like skin scrapings, nail clippings, hair & hair stub were processed for 130 clinically suscspected Dermatophytosis case. All the samples were subjected for KOH mount & culture on to SDA.

Results: Majority of the patients were male 76(58.46%) compared to female 54(41.53%). Most commonly affected age group 20-30 years. Tinea corporis was the predominant type comprising 66(50.76%), followed by tinea cruris 25(19.23%), tinea unguinum 18(13.84%) & tinea capitis 10(07.69%). Trichophyton rubrum was the predominant isolate comprising of 27(38.57%) cases followed by Trichophyton mentagrophytes 16(22.85%), Microsporum audoni 15(21.42%), Microsporum gypsum 08(11.43%), Trichophyton violaceum 03(4.28%) and Epidermophyton floccosum 01(1.43%).

Conclusion: Dermatophyte infections are very common in our country where hot and humid climate along with the poor hygienic conditions favor the growth of these fungi. There is varying difference in isolation of different species across the different parts of India. The predominant species was the Trichophyton rubrum followed by Trichophyton mentagrophytes, Microsporum audoni.

Key words: Dermatophytosis, Trichophyton rubrum, Tinea corporis, Microsporum spp.

Key messages: Dermatophytosis also known as Tinea is common in India which is the tropical country where poor hygiene, overcrowding & high humidity favors the spread of the disease

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Introduction

Dermatophytosis refers to superficial fungal infection of keratinized tissues caused by dermatophytes. The causative agents, the dermatophytes, are hyaline septate molds. These are divided into three main genera depending on their morphological characteristics into Trichophyton, Epidermophyton and Microsporum.¹ Dermatophytes colonize only the cornified layer of epidermis or suprafollicular portions of hair and do not penetrate into deeper anatomical sites. Dermatophytosis produces dermal inflammatory response which results in intense itching and it is also of great cosmetic importance.^(1,2)

Dermatophytosis is generally called ‘Tinea’, where Tinea is a Latin word which means “ring worm”. It is a contagious, host to host transmissible infection of humans and animals. Although Dermatophytosis is not

debilitating or life threatening, it can be persistent, troublesome and are often confused with other skin disorders. So, laboratory investigations are essential for correct diagnosis, management and to minimize cost.^(1,3) In addition, isolation and identification of the etiological agents can assist in controlling infections due to household pets or other domesticated animals where there is an ongoing source of inoculum.³

These infections of skin and its appendages are more prevalent in India, which is a tropical country, due to favorable climatic conditions like temperature and humidity. In India, Dermatophytosis is adversely influenced by various factors like poverty, poor hygiene and overcrowding.³ Species distribution & prevalence varies with the geographical area & during the course of time and is governed by environmental conditions, personal hygiene and individual’s susceptibility. The epidemiology of most of the clinically significant dermatophytes has substantially changed over last few years.⁴ Though there are many studies across the country, there is very little data about Dermatophytosis in our region. Hence this study is undertaken with the aim of identification, isolation and clinico-mycological study of Dermatophytosis.

Objectives of study

1. To isolate & speciate the dermatophytes
2. To analyse clinico-mycological profile of Dermatophytosis.

Materials and Methods

Source of data: This retrospective study was conducted on hundred and thirty clinically suspected cases of Dermatophytosis who attended the outpatient department of dermatology and venereology of our hospital.

Method of collection of data: Detailed history of the patients regarding age, sex, site of lesion, occupation and associated illness was taken and patients are examined clinically for the type and site of lesion. Before collection of sample, patient was explained about the procedure.

Collection of specimen: The site was cleaned with cotton swab soaked in normal saline. Sterile nail clippers, forceps for epilation of hair, sterile scalpel blades were used to collect clinical specimens like nail, infected hair and skin scrapings respectively.

Direct microscopy: The hair and skin specimens were examined by 10% KOH mount after one hour incubation at room temperature. The nail clippings were examined by 40% KOH mount after 4-5 hours of incubation at room temperature. All the clinical specimens were examined for retractile, hyaline fungal filaments.

Culture: The clinical material was inoculated into two sets of Sabouraud's dextrose agar (SDA) with cyclohexamide and chloramphenicol. One of the inoculated agar slants was incubated at room temperature and other at 37°C. They were observed for

4 weeks for growth after which it was considered negative and discarded. Identification of the growth on SDA done by tease mount technique and slide culture technique.⁵

Results

Our study group includes a total of 130 clinically diagnosed patients. Majority of the patients were male 76(58.46%) compared to female 54(41.53%). Most commonly affected age group 20-30 years followed by 30-40years as shown in Fig. 1.

Out of 130 clinically suspected cases of Dermatophytosis, tinea corporis was the predominant type comprising 66(50.76%), followed by tinea cruris 25(19.23%), tinea unguinum 18(13.84%) & tinea capitis 10(07.69%) as shown in Fig. 2.

Out of 130 clinically diagnosed, 98 (75.38%) cases were positive for KOH &/or culture. Remaining 32 (24.61%) cases were negative for both KOH & culture. 28(21.53%) cases were positive for KOH but negative for culture whereas 04(03.07%) cases were negative for KOH but yielded the fungal growth. Remaining 66(50.76%) cases have shown the fungal filaments in KOH mount and also yielded the growth as depicted in Fig. 3.

Culture has yielded all three types of dermatophytes, Trichophyton, Microsporum & Epidermophyton. *Trichophyton rubrum* was the predominant isolate comprising of 27(38.57%) cases followed by *Trichophyton mentagrophytes* 16(22.85%), *Microsporum audoni* 15(21.42%), *Microsporum gypsiium* 08(11.43%), *Trichophyton violaceum* 03(4.28%) and *Epidermophyton fluccosum* 01(1.43%) as shown in Table 1.

Table 1: Showing Dermatophytes isolates in different clinical types of tinea

Fungal isolates	Tinea corporis	Tinea cruris	Tinea unguinum	Tinea capitis	Tinea pedis	Tinea barbae	Total
<i>Trichophyton rubrum</i>	13(37.14%)	08(50%)	04(33.33%)	01(25%)	00	01(100%)	27(38.57%)
<i>Trichophyton mentagrophytes</i>	07(20%)	04(25%)	03(25%)	01(25%)	01(50%)	00	16(22.85%)
<i>Trichophyton violaceum</i>	01(35%)	01(6.25%)	00	01(25%)	00	00	03(4.28%)
<i>Microsporum audoni</i>	08(22.85%)	02(12.5%)	04(33.33%)	01(25%)	00	00	15(21.42%)
<i>Microsporum gypsiium</i>	05(14.28%)	01(6.25%)	01(8.33%)	00	01(50%)	00	08(11.43%)
<i>Epidermophyton fluccosum</i>	01(35%)	00	00	00	00	00	01(1.43%)
Total	35	16	12	04	02	01	70

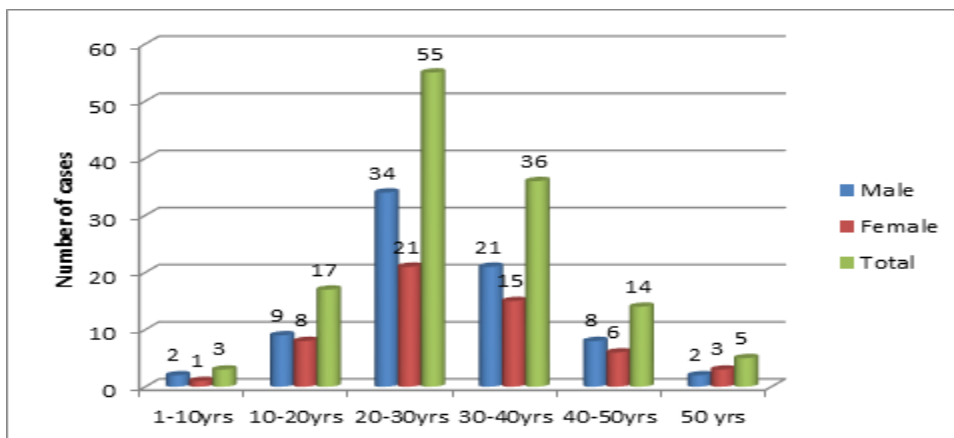


Fig 1: Showing Age & sex wise distribution of Cases

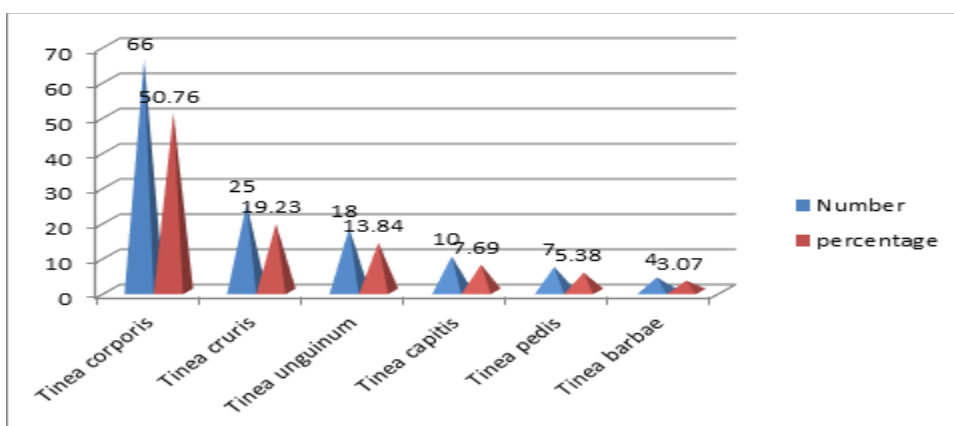


Fig 2: Shows type of clinically diagnosed Dermatophytosis

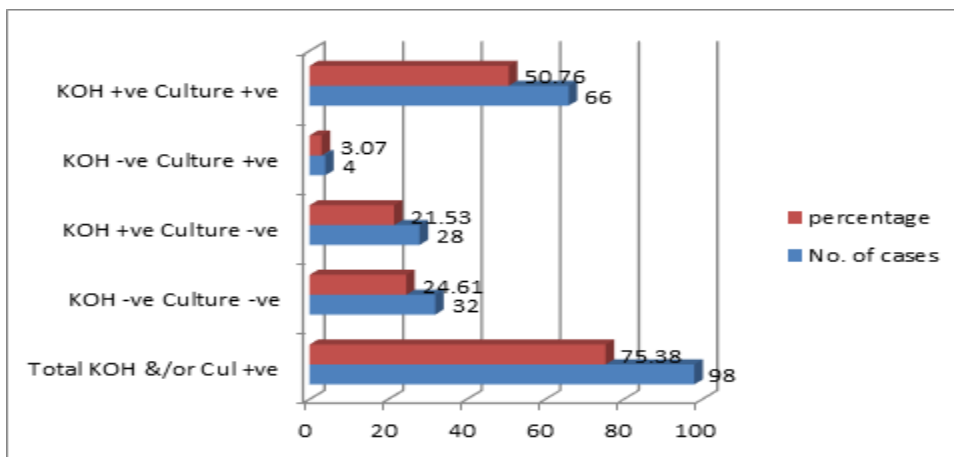


Fig 3: Depicts correlation between KOH mount & Culture findings

Discussion

Dermatophytes are the distinct group of fungi that infect the skin, hair & nails of human and animals producing a variety of cutaneous infections known as ringworm. Gross appearance of lesion is that of outer ring of active, progressing infection with central healing within the ring.⁶The epidemiology of superficial fungal infections has changed significantly in the last century and reflects changes in socioeconomic conditions,

lifestyles and migration. The higher incidence of Dermatophytosis could be attributed to environmental conditions.⁷In the present study, Dermatophytosis was found to be commonest in the age group 20-30 years which is in accordance with Sumathi S et al.⁶ Higher incidence was noted amongst the male 58.46% than females 41.53% which is well with the most of the others. The higher incidence in males may be attributed to their outdoor physical activities, trauma, hormonal

pattern & sweating.^{1,7,8}

Tinea corporis was the commonest clinical type in the present study comprising 66(50.76%), followed by tinea cruris 25(19.23%), tinea unguinum 18(13.84%) & tinea capitis 10(07.69%) and this finding was in accordance with Santhosh Krishna H et al.^{9,3}

Out of 130 clinical samples, 98 (75.38%) cases were positive for KOH &/or culture. Remaining 32 (24.61%) cases were negative for both KOH & culture. 28(21.53%) cases were positive for KOH but negative for culture whereas 04(03.07%) cases were negative for KOH but yielded the fungal growth. Remaining 66(50.76%) cases are KOH positive and also yielded the growth. This finding was in line with Thongam Singh et al.^{3,4}

The predominant fungal isolate in the present study is *Trichophyton rubrum* comprising of 27(38.57%) cases followed by *Trichophyton mentagrophytes* 16(22.85%), *Microsporum audoni* 15(21.42%), *Microsporum gypseum* 08(11.43%), *Trichophyton violaceum* 03(4.28%) and *Epidermophyton floccosum* 01(1.43%). Many authors like Thongam Singh et al³, Santhosh Krishna H et al⁹, have also shown the similar results. But Grover Sanjiv et al¹⁰ have reported *Trichophyton tansurans* as the predominant fungal isolate. *Trichophyton rubrum* was the commonest fungal isolate due to its better adaptation, more virulence and easily colonization on hard keratin.²

Conclusion

Dermatophytosis is the trivial disease which has psychological effects as well as costly in terms of treatment. Dermatophyte infections are very common in our country where hot and humid climate along with the poor hygienic conditions favor the growth of these fungi. The most common clinical type of Dermatophyte was tinea corporis followed by tinea cruris. There is varying difference in isolation of different species across the different parts of India. But *Trichophyton* was the predominant fungal agent in most of the studies. The predominant species was the *Trichophyton rubrum* followed by *Trichophyton mentagrophyte*, *Microsporum audoni*. Good hygiene, sanitation and washes are effective methods of prevention of these fungal infections.

What is new? Dermatophytosis is caused by all three species of dermatophytes in this area

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