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CLINICO-MYCOLOGICAL PROFILE OF DERMATOPHYTOSES IN UDAIPUR, RAJASTHAN

Microbiology

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ABSTRACT

Introduction: Dermatophytoses is the most common type of cutaneous fungal infection in human affecting skin, hair and nails. It has become a significant health problem with increased incidence over last few years in India.

Aims And Objectives: The aim of this study was to find out the clinico-epidemiological profile and etiological agents of dermatophytoses using standard mycology techniques.

Materials And Methods: A total of 105 clinically diagnosed cases of dermatophytoses attending the dermatology outpatient department during a four month period (January 2018 to April 2018) were included in this study. Direct microscopy (KOH mount), culture and identification were done according to standard procedures.

Results: Out of the 105 patients, the maximum cases were seen in the age group 21 -30 year (35.2%) with male predominance. Tinea cruris (37.1%) was the commonest clinical type followed by mixed infection of Tinea corporis with Tinea cruris (32.4%). Out of 105 patients, 75 (71.4%) were positive in KOH mount and 81 (77.1%) by culture for dermatophytes. Trichophyton rubrum (34.6%) was the predominant species isolated followed by Trichophyton mentagrophytes (27.2%), Trichophyton verrucosum (12.3%).

Conclusion: Tinea cruris was the most common clinical pattern and Trichophyton rubrum was the most common causative agent of dermatophytoses in this region.

KEYWORDS

Dermatophytoses, Trichophyton, Tinea cruris, Tinea corporis

INTRODUCTION:

Dermatophytic infections are one of the most common diseases encountered by dermatologists in outpatient departments and there has been an increasing trend of dermatophytoses over the last few years in different parts of India.[1],[2] Dermatophytoses are superficial infections of keratinised tissue affecting skin, hair and nails, caused by organism of three genera of fungi *Microsporum*, *Trichophyton* and *Epidermophyton*.[3] Skin infection due to dermatophytes has become a significant health problem affecting children, adolescent and adults. It is common in tropical and subtropical regions in areas of high heat and humidity. Factors as overcrowding, lack of personal hygiene and exposure to animals or cases play a role in the frequency of Dermatophytoses in different individuals.[4] Recently, there has been an increase in the incidence of fungal infections in developing countries. This may be the result of frequent usage of antibiotics, environmental condition, immuno-suppressive drugs and various conditions, like organ transplantation, lymphomas, HIV.[5]

The present study was undertaken to assess the clinical and mycological profile of dermatophytic infection and identify the species of fungi using standard techniques and to compare the clinical diagnosis by KOH mount and culture.

MATERIALS AND METHODS

A total of 105 clinically suspected cases of dermatophytoses attending the dermatology outpatient department of a tertiary care hospital, Udaipur, Rajasthan, during the period January 2018 to April 2018 were included in this study. A detailed clinical history, including age, sex, duration, site and extent of infection, type of lesion and given antifungal was taken. Patients were examined and grouped in different clinical types depending upon the site of involvement.

The infected area was first cleaned with 70% ethyl alcohol swabs and then samples were collected from the site of the lesion. Skin scrapings were taken with a blunt sterilized scalpel from the active site of the lesion using standard mycological techniques and collected in sterilized paper folders.

KOH MOUNT

Each specimen was subjected to direct microscopy in 10% potassium hydroxide (KOH) wet mount to determine the presence of fungal hyphae.[6]

CULTURE

Each specimen was inoculated on two tubes, Sabouraud's dextrose agar (SDA) slope with chloramphenicol only and Sabouraud's dextrose agar slope with both chloramphenicol and cycloheximide added to avoid contamination with bacteria and saprophytic fungus. Culture tubes were incubated at 25 ^{0}C for 4 weeks and checked twice in a week for any growth. In absence of growth even after four weeks, the culture was declared negative.

The mycological identification was based on macroscopic and microscopic examination of the culture isolates. The macroscopic examination of dermatophytes was characterized by duration of growth, surface morphology and pigment production on the reverse. The microscopic examination of fungal growth was observed with lactophenol cotton blue stain. Species identification was done based on nature of mycelium and conidia formation (macro and micro conidia) and presence of chlamydospores. Urease test was done to differentiate Trichophyton species. Slide culture was also performed when required.

RESULT

Out of the 105 patients, the maximum cases were seen in the age group 21 -30 year (37 cases, 35.2%), followed by age group 11-20 year (24 cases, 22.9%), 31-40 year (19 cases, 18.1%), 41-50 year (15 cases, 14.3%), 51-60 year (5 cases, 4.8%), 61-70 year (3 cases, 2.9%) and upto 10 year (2 cases, 1.9%). In this study, 84 (80%) patients were male and 21 (20%) were female. Male to female ratio was 4:1.

Tinea cruris (39 cases, 37.1%) was the commonest clinical type followed by *Tinea corporis* with *cruris* (34 cases, 32.4%) and *Tinea corporis* (16 cases, 15.2%), multiple site involvement (*Tinea cruris* with *Tinea corporis and Tinea facie*) (10 cases, 9.5%), *Tinea cruris with facie* (3 cases, 2.9%), *Tinea pedis* (2 cases, 1.9%), *Tinea facie* (1 case, 1%). (Table 2)

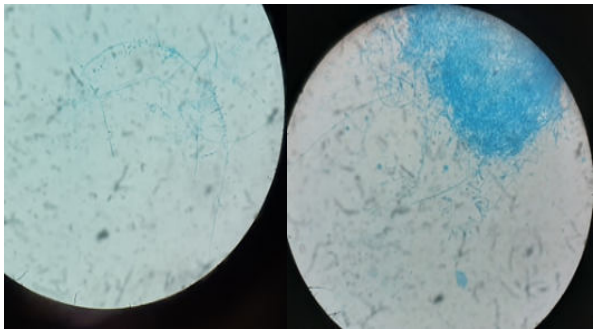
Out of 105 patients, 75 (71.4%) tested positive by direct microscopy and 81 (77.1%) by culture for dermatophytes. Twelve patients were negative for dermatophytes by direct microscopy but yielded growth on culture; six were positive on direct microscopy but negative on culture. Eighteen cases were negative by both techniques.(Table 1)

TABLE 1(original): Correlation of results between KOH and Culture examination

	KOH positive	KOH negative	Total
Culture positive	69	12	81(77.1%)
Culture negative	06	18	24(22.9%)
Total	75(71.4%)	30(28.6%)	

Among 105 specimens cultured 81 dermatophytes (77.1%) and 6 non dermatophytic fungus (5.7%) were isolated which includes *Aspergillus species*. There was no growth in 18 specimens. Among the dermatophyte species isolated *T. rubrum* (34.6%) was the predominant species isolated followed by *T. mentagrophytes* (27.2%), *T. verrucosum* (12.3%), *T. tonsurans (11.1%) T. schoenleinii (9.9%), T. violaceum* (2.5%) and *Microsporum spp*.(2.5%), Mycelia sterilia (1.2%). (Fig 1,2)

Figure 1 SDA tube showing growth of Trichophyton rubrum



(a) **(b)**

Figure 2:
a. Microphotograph of *Trichophyton rubrum* showing abundant tear drop microconidia
b. Microphotograph of *Trichophyton mentagrophyte* showing numerous spiral hyphae and round microconidia (LPCB mount magnification 40X)

T. rubrum was commonest species in *Tenia cruris* (32.5%), followed by *T. mentagrophytes* (15%). In *Tinea corporis T. mentagrophyte* (31.3%) was predominating species, followed by *T. verrucosum* (18.8%). In *Tinea cruris* with *corporis* both *T. rubrum* (26.5%) and *T. mentagrophyte* (23.5%) were predominating species.

Table 2(original):Prevalence Pattern Of Dermatophytic Fungi

Clinical manifestation	Total No. of cases (%)	T. rubrum	T. mentagrophyte	T. tonsurans	T. verrucosum	T. schoenleinii	T. violaceum	Microsporum spp	Aspergillus spp	No growth	Mycelia sterilia
Tinea cruris	39 (37.1)	13	6	3	4	3	1	1	2	6	0
Tinea corporis	16(15.2)	2	5	2	3	1	0	0	1	2	0
Tinea pedis	2(1.9)	0	0	0	0	1	0	0	0	1	0
Tinea facie	1(1)	0	0	0	0	1	0	0	0	0	0
Tinea cruris +Tinea corporis	34(32.4)	9	8	4	2	2	0	1	2	6	0
Tinea cruris+ Tinea corporis+ Tinea facie	10(9.5)	3	1	0	0	0	1	0	1	3	0
Tinea cruris+ Tinea facie	3(2.9)	1	1	0	1	0	0	0	0	0	1
Total	105(100)	28	21	9	10	8	2	2	6	18	1

DISCUSSION

In the present study, dermatophytoses was more common in the age group of 21–30 years (35.2%) with males outnumbering females. Similar findings have been reported by other worker.[7-9] The higher incidence in young males could be due to greater physical activity and increased sweating. Various clinical forms observed in the study were *tinea corporis, tinea cruris, tinea pedis, tinea faciei* and mixed infection of these. Among the clinical types, *tinea cruris* was revealed to be highest (37.1%) followed by *Tinea corporis* with *cruris* (32.4%). This is in accordance with Sardari *et al*.[10] and Verma *et al*.[11] While, in the studies by Agarwal *et al*.[12] in Jaipur, Rajasthan, Surendran *et al*.[8] and Kumaran *et al*.,[9] it has been reported that *Tinea corporis* was the most common clinical type. However, in our study *Tinea cruris* was common in comparison with *tinea corporis*. Less aeration due to tight clothing, maceration and high rate of sweating in groin and waist region and poor intimate hygiene make this site more vulnerable to dermatophytoses.[13] Recurrence and chronicity were observed to be more frequent in *Tinea corporis* and *Tinea cruris*[13], the severe itching associated with these two conditions, making them seek medical advice. Among 47 mixed clinical types, *tinea corporis* with *tinea cruris* was highest (34 cases, 72.3%). Similar findings were obtained by Surendran et al.[8]

Out of 105 patients, 75 (71.4%) were positive by KOH examination and 81 (77.1%) by culture for dermatophytes. Agarwal et al.[12] (KOH positivity 84.67% and culture positivity 80%) and Sahai and Mishra[14] (KOH positivity 89.6% and culture positivity 83%) reported similar dermatophyte isolation rates respectively but KOH positivity rate was less than culture positivity in our study. This is may be because culture is more sensitive. These results were much higher than the culture and KOH positivity obtained by Lyngdoh et al. (29.3%, 38.2%)[4] and Kumaran et al. (55%, 65%).[7]

The difference in these rates among different studies may be due to factors involved in the collection, transport and inoculation of specimens, culture conditions, severity, type and stage of disease and the effect of antifungal agents.[12]

Trichophyton species were more commonly isolated than *Epidermophyton* and *Microsporum species. Trichophyton rubrum* was the most common dermatophyte (34.6%) This is in accordance to reports of other authors from different regions of India.[4,8,12,15] The ability of *Trichophyton rubrum* to survive and adapt well to skin surfaces, chronicity of infection, ability of the viable spores to survive in many habitats such as floors may enhance the spread of this dermatophyte even in societies with a high level of hygiene.[16,17] Other species isolated were *T. mentagrophytes* (27.2%), *T. verrucosum* (12.3%), *T. tonsurans (11.1%) T. schoenleinii (9.9%), T. violaceum* (2.5%) and *Microsporum spp*.(2.5%). T. rubrum and T. mentagrophyte were commonest species in all clinical types of tinea.

CONCLUSION

The present study gives an insight about the etiological agents and higher incidence rate of Dermatophytoses in this part of Rajasthan. *Tinea cruris* was the most common clinical pattern and *Trichophyton rubrum* was the most common causative agent of dermatophytoses in this region. The epidemiology of dermatophytoses vary in different geographical regions and may change with time. So, this data provides an assessment of the prevalence and etiological profile which could help in the estimation of the problem and hence in the prevention of spread of dermatophytoses with adequate control measures.

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