Original Article

Clinico-mycological profile of dermatophytosis in Meghalaya

Abstract

Background: Dermatophytosis though trivial, exerts a psychological effect and requires effective treatment which is often costly. Numerous studies on clinico-mycological aspects of dermatophytosis have been conducted in different parts of India but no reports are available from the state of Meghalaya. **Aims:** The study was therefore aimed at determining the prevalence and etiological agents of dermatophytosis amongst the patients attending the Department of Dermatology, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS) Shillong. **Materials and Methods:** A total of 259 samples obtained from 237 clinically diagnosed cases of fungal infection of the skin, hair and nails were included. Direct microscopy (Potassium hydroxide (KOH) mount), culture and identification were done according to standard procedures. **Results:** The major clinical group was found to be *Tinea pedis* (26.6%) followed by *Tinea corporis* (18.9%) and *Tinea cruris* (14.3%). *Tinea capitis* was predominantly seen in children (72.7%). The maximum cases were seen in the age group of 21-30 years (34.4%) showing a male predominance. Direct microscopy (KOH mount) were positive in 99(38.2%) of the 259 samples whereas; 76 (29.3%) were positive on culture. The predominant dermatophyte species isolated was *Trichophyton rubrum* (30.3%) followed by *Trichophyton mentagrophytes* (28.9%). **Conclusion:** The present study, gives an insight about the etiological agents of dermatophytosis in this part of India. This data provides an assessment of the prevalence and etiological profile which would help in the estimation of the problem and hence in the prevention of dermatophytosis with adequate control measures.

Key words: Dermatophytes, tinea, trichophyton

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INTRODUCTION

Dermatophytosis is an infection of the skin, hair or nails by keratinophilic fungus called 'Dermatophytes'. They are classified into Epidermophyton, Microsporum and Trichophyton.[1] Dermatophytosis is one of the most common diseases in human beings,[2] the prevalence of which varies in different parts of the world. It is common in tropical 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 Dermatophytosis in different individuals. It has become a significant health problem affecting children, adolescents and adults. This infection although trivial, has a lot of psychological effect and requires effective therapy which is often costly. Although numerous studies on clinico-mycological aspects of Dermatophytosis have been conducted in different parts of India, no reports are yet available from the North-eastern state of Meghalaya. The present study was therefore aimed at determining the prevalence and etiological agents of dermatophytosis amongst the patients attending the Department of Dermatology, North Eastern Indira Gandhi Regional Institute of Health and Medical Sciences (NEIGRIHMS) Shillong.

MATERIALS AND METHODS

This study was done as a retrospective analysis after ethical clearance and included a study population of 237 patients clinically diagnosed with Dermatophytosis attending the outpatient Department of Dermatology, NEIGRIHMS, Shillong over a period of one year from April 2011 to March 2012. The institute of NEIGRIHMS is a tertiary care centre under the Ministry of Health and Family Welfare, Government of India. It is the apex referral centre in the state of Meghalaya and has a full-

fledged Department of Microbiology. Collection and processing of the samples was done at the Department of Microbiology, NEIGRIHMS, Shillong. A detailed history of the patients was taken. The site type and duration of the lesions were noted including any occupational exposure to animals or cases. Depending upon the different clinical types, specimens were collected accordingly. Skin scrapings were collected from the edges of the lesions, infected hairs were plucked and nail scrapings, clippings and sub-ungual debris were collected. All specimens were subjected to direct examination (10 or 20% KOH mount) and culture on Sabouraud dextrose agar (SDA), SDA medium with Chloramphenicol (0.05mg/mL) and Cycloheximide (0.05mg/mL) and Dermatophyte agar (DA). Cultures were incubated at 25°C and 37°C for four weeks and examined daily in the first week and twice a week thereafter for any growth. A final negative report was given after four weeks. Identification was done on the basis of colony characteristics as well as microscopic morphology in Lactophenol cotton blue mount. Slide culture, culture on Potato dextrose agar, urease test and hair perforation test were done when necessary.[3]

RESULTS

In this study, the majority of cases were seen in the age group of 21-30 years (34.4%). Most of the patients were males (72.6%) especially of the age group of 21-30 years (24.7%) whereas women constituted only 27.4% of the clinical cases. The majority of the patients belong to the low income group (Kupuswamy). In this study, the maximum cases were seen in the summer months of April to September. Fewer cases occurred during the autumn and winter months. Out of a total of 237 clinically diagnosed cases of Dermatophytosis, 259 samples were obtained. Culture was positive from 76 samples (29.3%) and 99 (38.2%) showed fungal hyphae by direct microscopy (KOH mount) [Table 1]. From the 76 culture positive samples, 5 (6.6%) of them showed no fungal elements on direct KOH mount whereas; 28 (28.3%) showed fungal elements on KOH mount but failed to grow in culture as seen in Table 2. The major clinical group was found to be *Tinea pedis* (26.6%) followed by *Tinea corporis* (18.9%) and *Tinea cruris* (14.3%) [Table 1]. *Tinea capitis* was seen mostly in children (72.7%) in the age group of 0-15 years.

Among the Dermatophyte species isolated, the predominant isolate was *Trichophyton rubrum* (30.3%) followed by *Trichophyton mentagrophytes* (28.9%) and *Trichophyton tonsurans* (26.3%). There were six isolates of *Trichophyton verrucosum*, two each of *Trichophyton schoenleinii* and *Epidermophyton floccosum* and one isolate of *Microsporum* species [Table 3].

DISCUSSION

In this study, the maximum number of cases was seen in the age group of 21-30 years (26.6%), showing a male predominance as seen in other studies,[4-7] this could be due to the fact that males are physically more active, which predisposes to increased sweating. The major clinical group in this study, was found to be *Tinea pedis* (26.6%) followed by *Tinea corporis* (18.9%) and *Tinea cruris* (14.3%). This frequency of

Table 1: Clinical cases and KOH and culture positive isolates

Clinical cases	Total no. (%)	KOH positive (%)	Culture positive (%)
Tinea cruris	37 (14.3)	19	17
Tinea corporis	49 (18.9)	15	15
Tinea pedis	69 (26.6)	26	16
Tinea faciei	16 (6.2)	07	10
Tinea unguium	34 (13.1)	16	04
Tinea manuum	20 (7.7)	09	07
Tinea capitis	11 (4.3)	01	01
Tinea incognito	16 (6.2)	05	05
Onychomycosis	07 (2.7)	01	01
	259	99 (38.2)	76 (29.3)

Table 2: Correlation between KOH examination and culture of the isolates

	KOH positive	KOH negative	Total
Culture positive	71	05	76 (29.3%)
Culture negative	28	155	183 (70.7%)
Total	99 (38.2%)	160 (61.8%)	259

Tinea pedis could be because the majority of people in Meghalaya tend to wear socks and shoes for prolonged periods irrespective of the weather hence; predisposing to sweating and fungal infections. Similar report has been given by Grover S and Roy P who reported an incidence of 29.2%.[8] *Tinea pedis* is also more common in adult males and young population associated with the use of sport footwear and sports.[9] *Tinea capitis* was predominantly seen in children. This could be because of the sharing of combs, caps, contact with other infected children and their inability to maintain hygiene. Previous studies had reported similar findings.[10,11] A higher prevalence was seen among the lower socio-economic group as also seen in other studies.[7,12,13] Large families, sharing of combs, towels and close contacts with infected family members and animals may be implicated. A history of contact with infected cases was reported from 10.3% of the cases whereas; only four cases had contact with animals (2 animal handlers, 1 veterinarian and 1 child). Bindu *et al.*,[10] had reported 16.6% contact with cases and Kamothi *et al.*,[7] had reported contacts as low as 3.09%. Direct microscopy using KOH preparation plays an important role in diagnosing fungal infections however culture gives a definitive diagnosis. In this study, five of the culture positive samples showed no fungal elements on direct KOH mount. This could be because the fungus could have been in an inactive sporulating phase difficult to be seen by microscopy but able to grow in appropriate media.[14,15] Of the culture negative cases, 28 showed fungal elements on KOH mount but failed to grow in culture. This could be due to non-viability of the fungi prior to inoculation.[15] This finding as also seen in other studies[16-18] highlight the importance of both KOH preparation and culture in diagnosis of Dermatophytosis.

Among the Dermatophyte species isolated, *Trichophyton rubrum* was the predominant isolate accounting for 30.3% followed by

Table 3: Dermatophytes isolated from different clinical types

Clinical types	T. mentagrophytes	T. tonsurans	T. rubrum	T. verrucosum	T. schoenleinii	E. floccosum	Microsporum spp.
T. cruris	08	04	04	–	–	–	01
T.corporis	04	07	04	–	–	–	–
T. faciei	01	03	02	04	–	–	–
T.pedis	04	03	08	–	–	01	–
T.unguium	02	–	01	–	–	01	–
T.manuum	02	02	01	02	–	–	–
T.capitis	–	01	–	–	–	–	–
T.incognito	01	–	02	–	02	–	–
Onychomycosis	–	–	01	–	–	–	–
Total	22 (28.9)	20 (26.3)	23 (30.3)	06 (7.9)	02 (2.6)	02 (2.6)	01 (1.3)

Trichophyton mentagrophytes (28.9%) which is in conformity with other studies.[2,5,6] 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.[19,20] Nirmala *et al.*, 2000[21] in their study, had highlighted the difficulty of treating chronic infection with *Trichophyton rubrum* and the frequency of recurrent infection with this dermatophyte. The frequency and chronicity of *Trichophyton rubrum* infection has been attributed to the ability of this dermatophyte to produce asymptomatic or less severe lesions which result in the early lesions being untreated and neglected by the patient.[4] In this study, two species of Trichophyton schoenleinii were isolated from Tinea incognito, similar findings of which has not been documented anywhere. This could provide an insight to a different pattern of infection in the North-East as compared to other parts of India.

CONCLUSION

The present study gives an insight about the etiological agents of Dermatophytosis in this part of India. 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 Dermatophytosis with adequate control measures. Moreover; awareness of the preventive measures regarding public health and maintenance of personal hygiene could reduce the incidence of Dermatophytosis and hence the burden of this disease in the community as a whole.

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