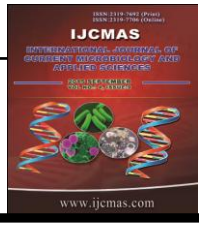
Int.J.Curr.Microbiol.App.Sci (2015) 4(9): 986-990

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Volume 4 Number 9 (2015) pp. 986-990**
http://www.ijcmas.com



Original Research Article

Incidence and Identification of Dermatophytes in a Tertiary Care Hospital in North Karnataka, India

C. Roopa[1*] and Sunilkumar Biradar[2]

[1]Department of Microbiology, Navodaya Medical College Hospital and Research Centre, Raichur, Karnataka, India
[2]Department of Microbiology, Mahadevappa Rampure Medical College, Gulbarga, Karnataka, India
**Corresponding author*

Keywords

Dermatophytes, Tinea infections, *Trichophyton*

A B S T R A C T

Dermatophytosis is superficial fungal infections caused by dermatophytes, a group of fungi that are capable of growing by invading the keratin of skin, hair, and nails. This is caused by a group of fungi called dermatophytes which include *Trichophyton*, *Microsporum* and *Epidermophyton*. A total of 213 samples from patients clinically suspected to have dermatophytosis were collected. Samples were collected in black sterilized Whatman paper and transported to the microbiological laboratory. Direct examination for fungal elements was done by using 10% KOH for skin and hair samples and 20% KOH for nail samples. The samples were cultured on Sabouraud's dextrose agar (SDA) with gentamicin and cycloheximide (SDA with actidione) and dermatophyte test medium (DTM). In this study, out of 213 clinically suspected cases, samples from 110 (56.33%) cases were culture positive. More number of cases was observed between age groups of 31–40 years and in males. *T. corporis* and *T. cruris* were more common in the age groups of 21–40 years. *Tinea capitis* was more common in children <10 years of age. Dermatophytic species isolated were *Trichophyton rubrum* (58.18%), *Trichophyton mentagrophytes* (19.09%), *Epidermophyton floccosum* (10%), *Trichophyton violaceum* (10%), *Trichophyton tonsurans* (1.81%) and *Trichophyton schoenleinii* (0.90%). Dermatophytosis is a commonly seen fungal infection in developing countries like India. Diagnosis of these infections requires proper clinical examination and laboratory diagnostic aids. Early diagnosis and prevention of predisposing factors play a major role in control of dermatophyte infection.

Introduction

Dermatophytosis is superficial fungal infections caused by dermatophytes, a group of fungi that are capable of growing by invading the keratin of skin, hair, and nails. This is caused by a group of fungi called dermatophytes which include *Trichophyton*, *Microsporum* and *Epidermophyton*. Infection is acquired by the deposition of

viable arthrospores or hyphae on the skin surface of the predisposed individual. Arthroconidia adhere to the keratinized tissue and once established, the spores germinate and penetrate the stratum corneum. Penetration by dermatophytes is brought about by secreting keratinases found exclusively in the dermatophytes (Tainwala and Sharma, 2011).

Overcrowding, poor hygiene, low standards of living along with high humidity environments are contributing to the increased prevalence of these fungal infections (Poluri *et al.,* 2015). North Karnataka is well known for its hot and humid conditions making its population at risk of many dermatophytic infections. Hence this study was undertaken to know the incidence and common clinical presentations of dermatophytosis involving skin, hair and nails in a tertiary care hospital in North Karnataka.

Materials and Methods

A total of 213 samples from patients clinically suspected to have dermatophytosis were collected in a period of one year from Nov 2011 to Nov 2012. A detailed history about age, sex, occupation, social status, duration of complaint and significant past history were taken.

After cleaning the lesions with 70% alcohol, scales were collected from erythematous growing margins of the lesion with a sterile blunt scalpel. Hairs were plucked with sterile forceps. Scrapings from the infected nail bed and from the undersurface of the nail as proximal to the cuticle were collected with a no.15 scalpel blade. Samples were collected in black sterilized Whatman paper and transported to the microbiological laboratory (Poluri *et al.,* 2015; Shenoy *et al.,* 2008).

Direct examination for fungal elements was done by using 10% KOH for skin and hair samples and 20% KOH for nail samples. The samples were cultured on Sabouraud's dextrose agar (SDA) with gentamicin and cycloheximide (SDA with actidione) and dermatophyte test medium (DTM). Samples were inoculated in two sets of the culture media. One set was incubated at 37°C and another set at 25°C in BOD incubator.

Cultures were examined twice weekly for the appearance of growth. Cultures were incubated for 4 weeks before discarding them as negative. Identification of fungal growth was done by macroscopic examination of colony morphology, pigment production and microscopic examination by lactophenol cotton blue preparation. Urease test was also performed to differentiate *Trichophyton* species.

Results and Discussion

In this study, out of 213 clinically suspected cases, samples from 110 (56.33%) cases were culture positive. Out of 110 positive samples, males were predominant 65 (59.09%) compared to females 45 (40.90%). More number of cases was observed between age groups of 31–40 years, followed by 21–30 years and 51–60 years (Table 1).

Clinical presentations of dermatophytosis observed were *Tinea corporis* 42 (38.18%), followed by *Tinea cruris* 38 (34.54%), *Onychomycosis* 9 (8.18%), Tinea pedis 7 (6.36%), *Tinea capitis* 4 (3.63%), *Tinea barbae* 4 (3.63%), *Tinea faciei* 3 (2.72%) and *Tinea manuum* 3 (2.72%) (Table 2).

When KOH positivity was studied in comparison with culture, KOH positivity rate is more than culture. Of 146 KOH positives only 110 were culture positive.

T. corporis and *T. cruris* were more common in the age groups of 21–40 years. *Tinea capitis* was more common in children <10 years of age. Dermatophytic species isolated were *Trichophyton rubrum* (58.18%), *Trichophyton mentagrophytes* (19.09%), *Epidermophyton floccosum* (10%), *Trichophyton violaceum* (10%), *Trichophyton tonsurans* (1.81%) and *Trichophyton schoenleinii* (0.90%) (Table 4).

Table.1 Age distribution of dermatophytes in the study

Age group	Number of positives	Percentage
0–10 years	3	2.72%
11–20 years	7	6.36%
21–30 years	32	29.09%
31–40 years	52	47.27%
41–50 years	2	1.81%
51–60 years	9	8.18%
Above 60 years	5	4.54%

Table.2 Clinical presentations of dermatophytosis

Dermatophyte infection	Number of cases	Percentage
T. corporis	42	38.18%
T. cruris	38	34.54%
Onychomycosis	9	8.18%
T. pedis	7	6.36%
T. capitis	4	3.63%
T. barbae	4	3.63%
T. faciei	3	2.72%
T. mannum	3	2.72%

Table.3 Comparison of KOH mount to culture

	KOH positive	KOH negative	
Culture positive	102	08	110
Culture negative	44	59	103
Total	146	67	213

Table.4 Dermatophytic species isolated

Dermatophyte species	Number	Percentage
Trichophyton rubrum	64	58.18%
Trichophyton mentagrophytes	21	19.09%
Epidermophyton floccosum	11	10%
Trichophyton violaceum	11	10%
Trichophyton tonsurans	2	1.81%
Trichophyton schoenleinii	1	0.90%

In this study, highest incidence of dermatophytosis was observed in the age group of 31–40 years and in males. This may be due to greater physical activity and increased sweating in this age group favoring the growth of dermatophytes. This correlates well with other studies done on dermatophytes (Mohanty *et al.,* 1998; Sentamilselvi *et al.,* 1997; Singh and Beena, 2003). *Tenia corporis*, followed by *T. cruris* were common clinical presentations of dermatophytosis in the present study which was in correlation with other studies from India (Mohanty *et al.,* 1998; Sentamilselvi *et al.,* 1997; Singh and Beena, 2003). The unhygienic conditions, increased humid weather and dusty environment of our country predispose the population for dermatophyte infections.

T. capitis was more common in children below the age group of 10 years, which was also observed in study done by Poluri *et al.* (2015). *T. rubrum* was the most common dermatophyte to cause all clinical types of dermatophytoses followed by T. mentagrophytes. This was in correlation with other studies done (Mohanty *et al.,* 1998; Sentamilselvi *et al.,* 1997; Singh and Beena, 2003).

Direct microscopy using KOH mount plays a important role in diagnosis, but definitive diagnosis is only by culture. In our study, eight of the culture positive samples showed no fungal elements in KOH examination. This could be because the fungus could have been spore form and not seen in microscopy. In our study, the incidence of dermatophytic infections was observed in the low socioeconomic group of people and rural background. This is because of unhygienic living conditions, overcrowding, illiteracy and poor nutrition among them. It may also be due to exposure to soil which carries arthrospores of dermatophytes and hence increases the risk of infection in rural areas. This is in correlation with various studies done on dermatophytes (Mohanty *et al.,* 1998; Sentamilselvi *et al.,* 1997; Singh and Beena, 2003). Increased physical activity and hot environmental conditions which results in increased sweating and excessive moisture favoring the growth of dermatophytes (Prasad *et al.,* 2005).

Preventive measures such as maintenance of personal hygiene, avoidance of tight and restrictive clothing and early diagnosis and treatment of clinically suspicious cases plays a major role in control of these infections.

In conclusion, dermatophytosis is a commonly seen fungal infection in developing countries like India. Diagnosis of these infections requires proper clinical examination and laboratory diagnostic aids. Early diagnosis and prevention of predisposing factors play a major role in control of dermatophyte infection.

Reference

Mohanty, J.C., Mohanty, S.K., Sahoo, R.C., Sahoo, A., Praharaj, N. 1998. Incidence of dermatophytosis in Orissa. *Indian J. Med. Microbiol.*, 16: 78–80.

Poluri, L.V., Indugula, J.P., Kondapaneni, S.L. 2015. Clinicomycological study of dermatophytosis in South India. *J. Lab. Physicians,* 7: 84–9.

Prasad, P.V., Priya, K., Kaviarasan, P.K., Aanandhi, C., Sarayu, L. 2005. A study of chronic dermatophyte infection in a rural hospital. *Indian J. Dermatol. Venereol. Leprol.,* 71: 129–30.

Sentamilselvi, G., Kamalam, A., Ajithadas, K., Janaki, C., Thambiah, A.S. 1997. Scenario of chronic dermatophytosis:

An Indian study. *Mycopathologia*, 140: 129–35.

Shenoy, M.M., Teerthanath, S., Karnaker, V.K., Girisha, B.S., Krishna Prasad, M.S., Pinto, J. 2008. Comparison of potassium hydroxide mount and mycological culture with histopathologic examination using periodic acid-Schiff staining of the nail clippings in the diagnosis of *Onychomycosis*. *Indian J. Dermatol. Venereol. Leprol.*, 74: 226–29.

Singh, S., Beena, P.M. 2003. Profile of dermatophyte infections in Baroda. *Indian J. Dermatol. Venereol. Leprol.*, 69: 281–3.

Tainwala, R., Sharma, Y.K. 2011. Pathogenesis of dermatophytoses. *Indian J. Dermatol.*, 56: 259–61.