

Clinico–mycological profiles of dermatophytoses associated with patients of tinea corporis in a tertiary care hospital

Neha Sharma^{1*}, Uma Tendolkar²

¹Speciality Medical Officer, ²Professor (Ritired), Department of Microbiology, Lokmanya Tilak Municipal Medical College, Sion, Mumbai.
Email: dr.neha1986ak@gmail.com

Abstract

Background: Tinea corporis affecting glabrous skin of the trunk and limbs is the commonest clinical form of dermatophytoses. Clinical lesions caused by the dermatophyte causing agents are highly variable and closely resemble other skin diseases making laboratory diagnosis and confirmation necessary. The present study was undertaken to assess the clinico-mycological profile of dermatophytoses associated with patients of tinea corporis. **Material and Methods:** In this prospective epidemiological study, 187 patients of all ages and sexes, clinically diagnosed as tinea corporis were studied by direct microscopy with 10% KOH and culture on SDA with antibiotics to isolate and identify dermatophyte causing species. **Results:** Dermatophytosis was common among the age group of 21-30 years with male to female ratio of 1.9:1. Abdomen was the commonest 142 (75.9%) site of infection. *Trichophyton rubrum* was isolated from 136 patients (72.7%) and *Trichophyton mentagrophytes* from 51 (27.3%). **Discussion:** Reactions to dermatophyte infection may range from mild to severe and depend on a variety of factors. Direct microscopy (in 10% KOH) and culture on SDA with antibiotics should be done in each case.

Key Words: Dermatophytoses, clinical signs, culture, trichophyton.

*Address for Correspondence:

Dr. Neha Sharma, Department of Microbiology, Lokmanya Tilak Municipal Medical College, 4th floor College Building, Sion, Mumbai.

Email: dr.neha1986ak@gmail.com

Received Date: 19/12/2016 Revised Date: 18/01/2017 Accepted Date: 05/02/2017

Access this article online

Quick Response Code:	Website: www.statperson.com
	DOI: 07 February 2017

INTRODUCTION

Dermatophytosis is a common clinical entity characterized by the infection of keratinized tissues such as skin, hair, and nails. This is caused by a group of fungi called dermatophytes. *Trichophyton*, *Microsporum* and *Epidermophyton* are the genera implicated to cause dermatophytoses¹. Prevalence of superficial fungal infections has been estimated to be around 20-25% worldwide by World Health Organization (WHO)². It is more prevalent in tropical and subtropical countries

including India, due to the hot and humid climate. Although not life threatening, its severity can cause great discomfort. It remains a general public health problem, which is prevalent in all age groups and both the sexes³. Tinea corporis affecting glabrous skin of the trunk and limbs (i.e., skin regions other than the scalp, groin, palms, and soles) is the commonest clinical form of dermatophytosis⁴⁻⁶. Clinical lesions caused by the dermatophyte causing agents such as *T. rubrum* and *T. mentagrophytes* are highly variable and closely resemble other skin diseases making laboratory diagnosis and confirmation necessary⁷. The diagnostic tests include potassium hydroxide (KOH) wet mount examination, wood's lamp examination, skin biopsy and fungal culture¹. The identification of the causative agent is necessary particularly in the case of tinea capitis which provides information on the risk of spread to other members at home or in the school. The present study was undertaken to assess the clinico-mycological profile of dermatophytoses associated with patients of tinea corporis.

MATERIAL AND METHODS

In this prospective epidemiological study, 187 patients of all ages and sexes, clinically diagnosed as tinea corporis [dermatophytosis of torso, extremities (excluding hand and feet) and face] and treatment naive patients at first visit were included. A well-tested questionnaire schedule had been designed to collect data on socio-demographic details and on infection types. For sample collection, the affected area was swabbed with 70% alcohol and the active edge of lesion scraped with a sterile scalpel. The scrapings were collected from the margins of the lesion without injuring the skin surface. The scrapings were collected in a sterile petri dish³. The samples were examined for dermatophyte hyphae, arthroconidia by using 10% KOH. Specimens were then cultured on Sabouraud’s Dextrose Agar (Merck, Germany) containing Chloramphenicol, Gentamycin and Cyclohexamide; and were kept at 26°C for four weeks. fungal growth was identified by slide culture and physiological and biochemical tests³.

RESULTS

Out of 187 patients, dermatophytosis was common among the age group of 21-30 years (35.3%). There were 109 males and 78 females showing more prevalence in males. In the total 187 patients, housewives constituted 26.8%, a substantial percentage of patients (12.8%) were labourers and 17.1% were students. Maximum number of patients, 92.5% patients had some level of education and 7.5% had not received any education. In our study 81.8% belonged to lower income group. Out of total 187 patients in the study 162 (86.6%) did not have any co-morbidities. Among the rest diabetes mellitus was the commonest co-existing disease in 17/187 (9.1%) patients. HIV infection (on anti-retroviral treatment) in 5/187 (2.7%) and allergic disorders in 3/187 (1.6%) patients. Overall abdomen 142 (75.9%) was the commonest site of infection, followed by back 112 (59.9%). Face 27 (14.4%) was the least commonly affected site. Among the total 187 patients studied only 4 patients (2.10%) had single lesion on body and 183 patients (97.9%) had multiple lesions. *T. rubrum* and *T. mentagrophytes* were the dermatophyte species isolated from 187 patients. *Trichophyton rubrum* was isolated from 136 patients (72.7%) and *Trichophyton mentagrophytes* from 51(27.3%). All the 187 patients of tinea corporis had typical signs and symptoms of scaling, raised border of lesion and itching. Papulovesicular rash and pain were complained by 3.7% of patients. Satellite lesions were observed in 4.8% of patients. There was no statistically significant difference in the signs and symptoms of *T. rubrum* infection and *T. mentagrophytes* infections. It was observed that at first visit, 103 out of 187 patients (55.1%) had duration of symptoms >3

months and 44.9% of patients had duration of symptoms < 3 months.

Table 1: Clinical signs of dermatophytosis

Clinical signs	<i>T. rubrum</i>	<i>T. mentagrophytes</i>	Total
Erythema	136	49	185 (98.9%)
Scaling	136	51	187 (100%)
Itching	136	51	187 (100%)
Raised border	136	51	187 (100%)
Papulo-vesicular rash	04	03	07 (3.7%)
Pain	04	03	07 (3.7%)
Secondary infection	06	07	13 (7%)
Weeping	03	02	05 (2.7%)
Lichenification	01	01	02 (1.1%)
Satellite lesions	03	06	09 (4.8%)
Central resolution	136	51	187 (100%)

DISCUSSION

Dermatophytic infections are widespread and cause discomfort. Reactions to dermatophyte infection may range from mild to severe. The present study was planned to understand the common dermatophyte species i.e., *T. rubrum* and *T. mentagrophytes* associated with the commonest dermatophytosis that is Tinea corporis. In present study, highest incidence of dermatophytosis was observed in the age group of 21-30 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 was in correlation with other studies⁸⁻¹¹. *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^{10,11}. Out of the total 187 patients, housewives constituted 26.8%, a substantial percentage of patients (12.8%) were labourers and 17.1% were students. On the other hand Jain *et al*¹², who have studied 160 cases of dermatophytosis report that 11.7% of their cases were housewives, 30.6% were employees and 30.1% were students. They proposed that the high infection among employees could be due to higher public interaction, travelling, handling of articles among people and more skin to skin contacts. It has also been observed that patients involved in exhausting physical work under the sun, sweating are more prone to get dermatophytosis¹³. Regarding occupational exposure, in one study by Sharma and Borthakur¹⁴, occupations related to agriculture were the commonest (39%) followed by students and unskilled labourers (15%). Increased contact with soil and excessive exposure for heat are proposed to be the reasons for increased incidence in farmers. One study by Das *et al*¹⁵ unskilled labourers were more commonly affected than professionals in causing superficial fungal infections. In our study, maximum number of patients, 92.5% patients

had some level of education and 7.5% had not received any education. In a study in 2014, in Uttarakhand on the prevalence of dermatophytosis, education was found to be a negligible factor as all educational groups, namely primary and secondary were infected with almost equal percentage of occurrence¹⁶. Recurrent, chronic and extensive dermatophytosis was found to be most common in very low and low income group patients whereas (20.3-17.8%) localised infections were common in middle and higher income group patients. It was suggested that the low and very low income groups maybe likely reservoirs of human ringworm infections in Chennai³. In our study 81.8% belonged to lower income group. In a study by Sivakumar *et al* in 2008, it was found that highest prevalence of superficial mycoses was seen in low socio economic group with 68 cases (74.7%) followed by middle socio economic status (18.68%) and least in high socio economic cases with only 1.6% cases¹⁷. In another study by Walke *et al*, it was seen that infection was most common in low socio economic group (87.78%) followed by middle socio economic group (10.62%) and least in high socio economic group (1.61%)¹⁸. In our study, the commonest affected site in *T. corporis* was the abdomen (75.9%) followed by back (59.9%) and buttocks (47.1%). The least affected site was the face. Thus, it appeared that the sites which are covered with clothes in close approximation were more affected than the exposed sites like arm (21.9 %) and forearm (19.8%). However, there was no significant difference in predilection for sites in *T. rubrum* and *T. mentagrophytes* infections. Trunk as the most commonly affected site has been reported by Das *et al* and Heidrich *et al*^{15,19}. In a study by Bhaduria *et al*, hips and waist involvement was seen in 10% of patients²⁰. Heidrich *et al* have reported 62% patients with arm involvement, in our study it was 21.9%¹⁹. Das *et al* reported 14% patients with forearm involvement which was comparable in our study (19.8%)¹⁵. Thigh was affected in 42.8% of our patients. Thigh involvement was reported by Gupta *et al* to be 6.67%. Their study was from Jaipur, climate differences, sweat factor, clothing material could be contributory factors²¹. There is a significant correlation between number of lesions and chronicity as stated in a study by Prasad *et al*²². There was found to be a very high prevalence of multiple lesions in our study (97.9%). In a 2014 study by Al-Khafaji, 60.8% of patients had one lesion, 31% of the patients had two lesions and others had more than two²³. In our study, almost all patients exhibited erythema, scaling, itching as clinical signs and symptoms and raised borders of the lesion. Similar findings were reported in their study by Gupta *et al*²¹. They have reported pain in 6.7%. In our study it was seen in 3.7% of patients. In a study by N. Sivakumar *et*

al, it was observed that 75% of patients had itching and irritation and 61 patients (81.33%) had mild to moderate scaling¹⁷. Two types of lesions are commonly encountered in *T. corporis*¹. One is dry and scaly annulare (annular patches) and the other vesiculare (iris form). *T. corporis* resulting from *T. rubrum* is particularly extensive and inflammatory, margins difficult to distinguish¹. It produces dry type lesions which begin as small, spreading elevated areas of inflammation, the margins remain red, slightly swollen, central area becomes covered with small scales. Spontaneous healing occurs in centre as circinate margins advances. Lesions have a tendency to become chronic¹. *T. mentagrophytes* produces vesicular type of lesions, vesicles appear irregularly or immediately behind advancing hyperaemic and elevated margins, crust is formed, healing follows in centre of lesion to leave a pigmented area. Chronic lesions are uncommon¹. Plaque type lesions, psoriasisiform lesions are the chronic type lesions produced by *T. rubrum*. Pruritis is common in all these types of infection¹. Most authors however do not find any difference in the symptomatology depending upon the species except that *T. mentagrophytes* which are zoophilic may lead to more severe inflammation. In our study, there was no significant difference between signs and symptoms in patients infected with *T. rubrum* and *T. mentagrophytes*. In our study, diabetes mellitus was the co-existing disease with dermatophytosis in 9.1% of patients which was comparable to the study by Bindu *et al* in 2002 in which diabetes mellitus was seen in 10.6% of patients with dermatophytosis¹¹. Poluri *et al* also record diabetes mellitus in 8.06% of patients²⁵. Thus our study shows concordant results with these studies. In conclusion, dermatophytosis is the commonly encountered fungal infection especially in developing countries like India. Reactions to dermatophyte infection may range from mild to severe and depend on a variety of factors. The sites which are covered with clothes in close approximation were more affected than the exposed sites. *T. rubrum* was the commonest species isolated followed by *T. mentagrophytes*. Direct microscopy (in 10% KOH) and culture on SDA with antibiotics should be done in each case.

REFERENCES

1. Hay RJ, Moore M. Mycology. In: Champion RH, Burton JL, Burns DA, Breathnach SM. Textbook of dermatology. 6th edn. London: Blackwell Scientific; 1998:1277-376.
2. WHO, Epidemiology and management of common skin diseases in children in developing countries. World Health Organization, Geneva. 2005.
3. Ranganathan S, Menon T, Sentamil GS. Effect of socio-economic status on the prevalence of dermatophytosis in

- Madras. *Indian J Dermatol Venereol Leprol* 1995; 61:16-8.
4. Sudha M, Ramani CP, Anandan H. Prevalence of dermatophytosis in patients in a tertiary care centre. *Int J Contemporary Med Res* 2016;3:2399-401.
 5. Agarwal US, Saran J, Agarwal P. Clinico-mycological study of dermatophytes in a tertiary care centre in northwest India. *Ind J Dermatol Venereol Leprol* 2014;80:194.
 6. Ramaraj V, Vijayaraman RS, Rangarajan S, Kindo AJ. Incidence and prevalence of dermatophytosis in and around Chennai, Tamilnadu, India. *Int J Res Med Sci* 2016;4:695-700.
 7. Tschen E. Clinical aspects of superficial fungal infections. *Dermatol Clin* 1984; 2(1):3-18.
 8. Mohanty JC, Mohanty SK, Sahoo RC, Sahoo A, Praharaj N. Incidence of dermatophytosis in Orissa. *Ind J Med Microbiol* 1998; 16:78-80.
 9. Sentamilselvi G, Kamalam A, Ajithadas K, Janaki C, Thambiah AS. Scenario of chronic dermatophytosis: An Indian study. *Mycopathologia* 1997; 140:129-35.
 10. Singh S, Beena PM. Profile of dermatophyte infections in Baroda. *Indian J Dermatol Venereol Leprol* 2003; 69:281-3.
 11. Bindu V, Pavithran K. Clinico-mycological study of dermatophytosis in Calicut. *Indian J Dermatol Venereol Leprol* 2002; 68:259-61.
 12. Jain N, Sharma M, Sharma M, Saxena VN. Spectrum of dermatophytoses in Jaipur, India. *African J Microbiol Res* 2014; 8(3): 237–43.
 13. Venkatesan G, Singh A, Murugesan AG, Janaki C, Shankar SG. *Trichophyton rubrum* – the predominant etiological agent in human dermatophytoses in Chennai, India. *Afr J Microbiol Res* 2007; 5: 9–12.
 14. Sharma S, Borthakur AK. A clinico-epidemiological study of dermatophytoses in Northeast India. *Ind J Dermatol Venereol Leprol* 2007; 73(6): 427-8.
 15. Das K, Basak S, Ray S. A Study on Superficial Fungal Infection from West Bengal: A Brief Report. *J Life Sci* 2009; 1(1): 51–55.
 16. Kainthola A, Gaur P, Dobhal A, Sundriyal S. Prevalence of Dermatophytoses in Rural Population of Garhwal Himalayan. *Int Res J Medical Sci* 2014; 2(8): 9–12.
 17. Sivakumar N, Karthikeyan A, Vivek A, Santhamani M. Prevalence of etiological agents in superficial mycoses with reference to dermatophytoses and pityriasis versicolor. *Internet J Microbiol* 2008; 7(2): 2–7.
 18. Walke HR, Gaikwad AA, Palekar SS. Clinico-mycological profile of dermatophytosis in patients attending dermatology OPD in tertiary care hospital, India. *Int J Curr Microbiol Appl Sci* 2014; 3(10): 432–40.
 19. Heidrich D, Garcia MR, Stopiglia CD, Magagnin CM, Daboit TC, Vetoratto G, Schwartz J. Dermatophytosis: a 16-year retrospective study in a metropolitan area in Southern Brazil. *J Infect Dev Ctries* 2015; 9(8): 865-871.
 20. Bhadauria S, Kumar S. Clinical Manifestations of dermatophytoses: A Review. *IJSR* 2015; 4(1): 428-431.
 21. Gupta S, Agrawal P, Rajawat R, Gupta S. Prevalence of dermatophytic infection and determining sensitivity of diagnostic procedures. *Int J Pharm Pharm Sci* 2014; 6(3): 35-38.
 22. Prasad PV, Priya K, Kaviarasan PK, Aanandhi C, Sarayu L. A Study of chronic dermatophyte infection in a rural hospital. *Ind J Dermatol Venereol Leprol* 2005; 71(2): 129-30.
 23. Al-Khafajii K. Myco-epidemiologic and genetic study of dermatophytosis and non-dermatophytes in Middle Euphrates, Iraq. *African J Microbiol Res* 2014; 8(24): 2381-2386.
 24. Rippon J.W. *Medical mycology. The pathogenic fungi and the pathogenic actinomycetes*: 2nd ed. Philadelphia,: W.B. Saunders;1982:154-241.
 25. Poluri LV, Indugula JP, Kondapaneni SL. Clinicomycological study of dermatophytosis in South India. *J Lab Physicians* 2015; 7(2): 84-89.

Source of Support: None Declared
 Conflict of Interest: None Declared