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RESEARCH ARTICLE

A STUDY OF DERMATOPHYTOSIS IN MEDICAL COLLEGE HOSPITAL, BELLARY

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ABSTRACT

Fungal infections are extremely common in the tropical regions. Dermatophytes are one of the commonest causes of skin infections. Although common, the precise size of the problem defies measurement. Aim of this study was to isolate and identify the dermatophytic agents from clinical samples from patients with different clinical types. Clinical samples from 180 patients were subjected to potassium hydroxide (KOH) examination and culture isolation; causative agents were identified macroscopically and microscopically. Out of 180 specimens, 112 (62.2%) were KOH positive and 68 (37.8%) were positive by culture technique. *Trichophyton rubrum* was the commonest isolate in skin samples among the patients suffering from dermatophytosis, followed by *T. mentagrophytes*. The study signifies the importance of mycological examination [both KOH & culture] in the diagnosis of dermatophytosis for their effective management.

INTRODUCTION

In 1975 and 1976, the World Health Organization (W.H.O) reported that mycoses are serious medical and social problem throughout the world and attempts should be made to provide mycological information and services to areas where they are a public health problem. The principle mycosis (fungal infection) affecting man can be distinguished by sites of the body affected (Kane and Smitka. 1980). The dermatophytoses constitutes a group of superficial fungal infections of keratinised tissues, viz; the epidermis, hair and nails, caused by a closely related group of filamentous fungi, the dermatophytes. There are three genera of dermatophytes- *Trichophyton, Microsporum* and *Epidermophyton* (Emmons *et al*., 1977). Dermatophytosis is a common disease in tropical countries due to factors like heat and humidity. Skin infection due to dermatophytes has become a significant health problem affecting children, adolescents and adults (Petmy *et al*., 2004). Dermatophytosis has been reported from different parts of India (Gujarathi *et al.*, 1996; Mohan *et al*., 1997; Mohanty *et al.*, 1998) but there are no reports from this part of Karnataka. The present study was undertaken to assess the clinico-epidemiological profile of dermatophytic infections, to identify the species of fungi and to compare the clinical diagnosis of KOH positivity with culture positivity.

MATERIALS AND METHODS

A total of 180 consecutive clinically diagnosed and untreated dermatophytoses cases attending Dermatology outpatient department of VIMS, Bellary constituted the material for the study. This study was undertaken for a period of two years from January 2005 to December 2006. A detailed history was taken from all patients. It included age, sex, socio-economic status, occupation, duration of disease, history of recurrence, habits and associated diseases.

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All the clinically suspected 180 cases were subjected to mycological work up. The specimens included skin scales, hair, hair roots and nail.

Microscopic examination

Direct microscopic examination was undertaken in 10% potassium hydroxide (KOH) wet mount for the specimens of skin scales while 40% KOH was employed for hair and nail specimens.

Cultivation of pathogen

All the cases were subjected to culture study. Scraping site was cleaned aseptically with 70% ethanol and the scales were collected in a sterile slide with the help of sterile scalpel. The culture was performed in Sabouraud Dextrose Agar (SDA) medium, incorporated with chloramphenicol 50 mg/L and cycloheximide 500 mg/L (Emmons *et al.*, 1977). The culture tubes were incubated at 30°C and the culture growth was observed and the tubes were discarded only after six weeks in the absence of growth. 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. Corn meal agar (CMA) was used to differentiate *Trichophyton rubrum* from *T. mentagrophytes* based on pigment production on the medium. In addition, hair perforation studies were carried out to distinguish between these two species (Emmons *et al*., 1977). The microscopic examination of fungal growth was observed with lactophenol cotton blue stain. Nature of mycelium and conidia formation (macro and micro conidia) helped to differentiate various genera and species.

RESULTS

68 (37.8%) out of 180 cases were positive for Dermatophytes by culture technique, whereas 112 (62.2%) cases have shown fungal elements by KOH preparation [Table 1]. The maximum affected age group was 15-30 years (40.4%).

Table 1. Results of direct microscopy and culture

	KOH +ve & Culture +ve	KOH +ve & Culture -ve	KOH -ve & Culture +ve
Number	70	50	18
Percentage (%)	38.8	27.8	10

Table 2. Number and percentage of different clinical samples

Clinical type	No. of cases	Percentage (%)
Tinea corporis	68	37.8
Tinea cruris	47	26.1
Tinea unguium	24	13.3
Tinea capitis	12	6.7
Tinea Pedis	6	3.3
Tinea barbae	7	3.9
Tinea faciei	10	5.6
Tinea axillaris	6	3.3

Table 3. Clinical types and species isolated

Clinical type	T. rubrum	T. mentagrophyte	T. tonsurans	E. floccosum	Total culture +ve	Total KOH ve
Tinea corporis (68)	6	8	1	-	15	28
Tinea cruris (47)	12	2	-	2	16	30
Tinea unguium (24)	7	2	-	-	9	14
Tinea capitis (12)	4	1	2	-	7	10
Tinea Pedis (6)	4	3	-	1	8	14
Tinea barbae (7)	3	-	1	-	4	6
Tinea faciei (10)	2	1	-	-	3	5
Tinea mannum (6)	4	2	-	-	6	5
Total (n=180)	42 (61.8%)	19 (27.9%)	4 (5.9%)	3 (4.4%)	68 (37.8%)	112 (62.2%)

Males were more affected than females and the majority of the patients were found to be belonging to the middle income group. Tinea corporis (37.8%) was the commonest clinical type followed by tinea cruris (26.1%) [Table 2]. Tinea faciei and tinea barbae were predominant in males and tinea axillaris was encountered predominantly among females. *T. rubrum* was the predominant species isolated (61.8%) in all clinical types followed by *T.mentagrophytes* (27.9%), *T.tonsurans* (5.9%) and *E.floccosum* (4.4%) as seen in [Table 3].

DISCUSSION

Dermatophytosis was common in the age group of 15 – 30 years affecting males more than females. The higher incidence in young males could be due to greater physical activity and increased sweating and the lower incidence in females may be due to the prevailing social stigma in rural population in India (Sarma S. Borthakur 2007). The most common clinical pattern observed was tinea corporis followed by tinea cruris. Tinea capitis was the predominant dermatophytic infection in children. Post – pubertal changes in hormones, resulting in acidic sebaceous gland secretions are responsible for decrease in incidence with age (Sarma S. Borthakur 2007). Similar finding was recorded by previous workers (Bindu 2002). The commonest isolate from the clinical source was T. rubrum, second common isolate being T. mentagrophytes. This is in correlation with other studies from India (Maheswari Amma *et al*., 1982; Bhargovi 1979; Sentamilselvi *et al*., 1997-1998). Eighteen (10%) specimens were positive by culture alone, fifty (27.8%) by direct microscopy (KOH) alone, highlighting the improtance of both direct microscopy and culture in the definitive diagnosis of dermatophytosis. Commonest clinical presentation in our study were patient having skin infection, followed by hair and nail infection. Specimens of nail and hair were frequently negative on direct microscopy. Positivity by culture and direct microscopy of nails was enhanced by combining the three methods of nail clipping, shaving or collection of sub ungual debris. This has been advocated by Hull and co-workers (Hull *et al*., 1998).

Conclusions

We conclude that dermatophytic fungal infections are one of the important causes of superficial mycosis. Direct microscopy and culture both are important tools of diagnosis for the fungal infections.

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