Original Article

Clinico-Mycological study of dermatophytosis in and around Kakinada

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ABSTRACT

Background: *Dermatophytosis is a clinical condition caused by a fungal infection of the skin in humans and domesticated animals. Currently up to 20% of the population may be infected by one of the dermatophytes.*

Objective*: To isolate and identify the fungal agents from clinical samples of dermatophytosis patients in and around kakinada.*

Materials and Methods*: Clinical samples from 150 patients were subjected to potassium hydroxide (KOH) examination and culture. Causative organisms are identified macroscopically and microscopically. Statistical analysis was done by chi square test.*

Results*: Out of 150 samples, 120 shown KOH positive and 66/120 (55%) samples were culture positive. Of these isolation rate of dermatophytes was 70/120 (58.3%) among these, 66 were Trichophyton species, 3 were Microsporum species, 1 was Epidermophyton floccosum. T.rubrum was the major isolate about 35(29.1%) strains. The male to female ratio of the positive cases was recorded as 11:3. The most effected age group was 21-30years (40%) followed by 31-40 years (28.6%).*

Conclusion*: It may concluded from the present study that Tinea corporis is more frequently encountered condition followed by Tinea cruris. T.rubrum was implicated as major predominating species followed by T.mentagrophytes. Unhygienic conditions among low socioeconomic group, frequent migration of laborers, workers, hot and humid climatic conditions may be some of the contributing epidemiological factors. The study signifies the importance of mycological examination of dermatophytoses samples for effective management and also for epidemiological studies.*

Key Words*: Dermatophytosis, tinea, trichophyton spp, microsporum spp, epidermophyton spp*

Introduction

Dermatophytosis is by far most common type of superficial mycoses usually limited to epidermis and its appendages effecting human beings. It is caused by a group of closely related filamentous fungi collectively known as Dermatophytes, which are physiologically adapted for growth on keratin. The infection of skin caused by dermatophytes is familiar as dermatophytosis. Other names like "Tinea" and "Ring worm" infection are synonyms of the word dermatophytosis. [1]

Dermatophytes are so ubiquitous in their distribution that no part of the world with human habitation is exempt from them. It is the most common mycotic disease in India and contribute a great bulk of cases attending the dermatology clinics. Its high prevalence in India is thought to be due to favorable tropical climatic conditions like high temperature and humidity. Primarily it depends on the habits and living conditions of people. It is only true contagious mycosis. [2]

Since these infections are often confused with other skin disorders, it is therefore, necessary to make early laboratory diagnosis for better management of these conditions. [3] The tinea infections are prevalent globally but they are common in tropics and may reach epidemic proportions in geographical areas with higher humidity, over-population and poor hygienic living conditions. [4]

As not much work has been done in recent past in this field and as the incidence and species prevalence vary from place to place. The present work is aimed to find out the incidence of dermatophytosis and species prevalence in clinically suspected cases of dermatophytosis in this part of our state.

More than 100 species of dermatophytes have been described but only 42 are considered valid and less than half are associated with human disease. These are divided into three main anamorphic genera depending on their morphological characteristic. [1]

- Trichophyton - 24 species
- Microsporum - 16 species
- Epidermatophyton - 2 species

Materials and Methods

This study was undertaken for a period of two years at Rangaraya Medical College/Government General Hospital, Kakinada. All the clinically suspected 150 cases were subjected to mycological work up. The specimens included skin scales, hair, hair roots and pus in cases of superficial mycoses. The research project was approved by ethics committee. Consent has taken from all patients.

Direct microscopic examination was undertaken in 10% potassium hydroxide (KOH) wet mount for the specimens of skin scales, pus crust, biopsy tissue and grains, while 40% KOH was employed for hair and nail specimens. [2]

The KOH positive 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 two different sets of antibiotic incorporated Sabouraud dextrose agar (SDA) media, one with chloramphenicol 50 mg/L and the other with cycloheximide 500 mg/L and in addition to chloramphenicol [2]. The culture tubes were incubated at 30^0C 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 study exact morphology. [2] 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.

Urease test used as an adjunct to the microscopic examination for the differentiation of dermatophyte species since most of them have ability to produce enzyme urease which hydrolyses urea.

Results

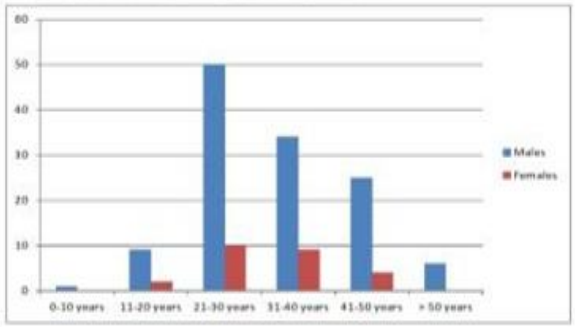

Fig.1 Incidence of dermatophytosis according to sex

Present study includes a total number of 150 cases clinically diagnosed as dermatophytes. Out of which 120 (80%) samples were KOH positive. Of the 150

samples analyzed in culture examination, 70(46.6%) were found positive for dermatophyte species.

Majority of cases in both sexes belong to the age group between 21-30 years i.e., 60cases (40%). Next affected age groups in order are 31-40 i.e., 43cases (28.6%). (Fig. 1) As per the sex incidence concerned among the 150 cases studied majority were males 125(83.3%). Out of 70 culture positives 55 were males and 15 were females

Table: 1 Sex wise distribution of different clinical types of dermatophytosis

Sex	T.corporis	T.cruris	T.capitis	T.pedis	T.unguim	T.corporis & T.cruris	T.barbae	Total	Percentage
Males	45	30	18	14	8	10	-	125	83.3
Females	11	-	5	6	3	-	-	25	16.7
Total	56	30	23	20	11	10	-	150	100
Percentage	37.3	20	15.3	7.3	6.7				

Table: 2 Correlating results of Direct microscopy of wet mount (KOH) and culture positives

	KOH positive	KOH negative	Total
Culture Positive	66(55%)	4(13.2%)	70(46.7%)
Culture Negative	54(45%)	26(86.7%)	80(53.3%)
Total	120(80%)	30(20%)	150(100%)

Table: 3 Dermatophytes distribution among various clinical types

Genera	T.corporis	T.cruris	T.capitis	T.pedis	T.unguim	Total
Trichophyton	36	10	8	3	4	66
Microsporum	1	-	2	-	-	3
Epidermophyton	-	-	-	1	-	1
Total						70

Out of 150 cases, 66(44%) were KOH and culture positive, 54(36%) were KOH positive and culture negative. Out of 150 cases most common clinical types observed was Tinea corporis 56(37.3%) followed by Tinea cruris 30(20%), Tinea pedis 26(13.3%), Tinea unguium 11(7.3%) is that order. In 10 cases both clinical type i.e., Cruris and Corporis were observed.

Out of 70 dermatophyte isolates 66 were Trichophyton species, 3 were Microsporum gypseum and 1 was Epidermophyton floccosum.

Among the trichophyton isolates, T rubrum was the major isolates yielding 35 strains, followed by 25 T mentagrophytes and 6 T violaceum strains.

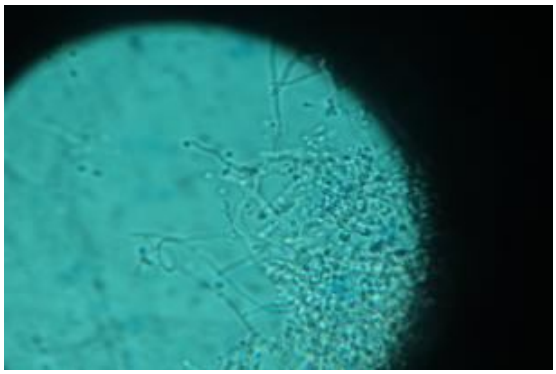

Fig. 2 Trichophyton mentagrophytes LPCB stain

Table: 4 Lesion wise and species wise distribution of culture positive cases

Genera	T.corporis	T.cruris	T.capitis	T.pedis	T.unguim	T.corporis & T.cruris	Total	Percentage
T.rubrum	20	7	1	2	3	2	35	50%
T.mentagrophytes	13	2	5	1	1	3	25	35.7%
T.violaceum	3	1	2	-	-	-	6	8.6%
M.gypseum	1	-	2	-	-	-	3	4.3%
E.floccosum	-	-	-	1	-	-	1	1.4%
Total	37	10	10	4	4	5	70	

Discussion

In the present study 150 specimens collected from clinically suspected cases of dermatophytosis were subjected for mycological examination and results are discussed below in detail comparing with similar studies done in different parts of the country.

Age Incidence

This study shown maximum number of cases in the age group of 21-30 years (40%) followed by 31-40 years (28.7%). The present study is in line with Kumar et al, [5] Banerjee U et al, [6] Amin AG et al, [7] Rao et al, [8] and in contrast with Suman et al[9] observed more cases in age group of 11-20 years.

The reason for the higher incidence in the second and third decade of life as

observed in our study may be due to more chance of exposure to infection due to their occupation and sweating will be more due to heavy work.

Low incidence in below 10 years, this may be due to they are not exposed to infections as frequently as adults or it may be lack of awareness and negligence as happens in children of rural areas.

Incidence according to Sex

In the present study males were commonly affected than females with male-female ratio of 11:3. Ratio is same as other studies - Kumar et al, [5] Sumana et al, [10] Banerjee U et al. [6] Male-Female ratio of 2:1 observed in Amin AG et al, [7] Rao et al. [8] This Male preponderance is due to excessive sweating related to heavy work or occupational exposure (zoophilic/ Geophilic). Females shown less incidence may due to lesser attendance to clinics.

Culture and microscopy

In the present study, Out of 150 cases, 66(44%) were KOH and culture positive, 54(36%) were KOH positive and culture negative. 4 cases were KOH negative and Culture positive, this may be due to patient is already on antifungals or steroids.

Dermatophyte Isolates

In this study 70 cases were culture positive, among them T rubrum (50%) was the predominant isolate followed by T mentagrophytes (35.7%). similarly reported by Kumar et al, [5] Suman et al, [9] Verenkar et al. [11] T violaceum was isolated in 8.6% of cases in the present study.

Microsporum gypseum was isolated in 4.3% of cases and epidermophytomn floccosum in the present study was isolted 1.4% of cases.

Dermatophytes isolated in different Clinical types

T corporis (37.3%) was the commonest clinical type observed in the present study followed by T cruris (20%). Sumana et al, [10] BK Gupta et al,[12] Verenkar et al,[11] Banerjee et al,[6] has also reported T corporis as the commonest clinical type. However Kumar et al,[5] Nagarkatti et al, [13] had reported T cruris as commonest clinical type followed by T corporis.

Majority of cases belong to low socioeconomic group from slums, of town and neighbouring villages. It is assumed that tight clothing without aeration, unhygienic habits and close association among the people may be the reasons for more predominance of infection in this group. Health education may lower the incidence of dermatophytosis in this group.

This study highlighted that tinea corporis is the commonest clinical type. In Trichophyton species, T rubrum and T mentagrophyte are the most common etiological agents and males are more frequently affected. Though various species of dermatophytes produce clinically characteristic lesions, but a single species may produce variety of lesions depending upon site of infection. Dermatophytoses is a trivial disease but has lot of psychological effect and a costly disease in terms of treatment.

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