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A Study On Causative Agents Of Dermatophytosis In Patients Attending Skin & Std Outpatient Department At A Government General Hospital

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Abstract:
Background*: Dermatophyte infections, most common in tropical countries like India pose a major health problem. Accurate assessment of the prevalence of dermatophytosis and identification of the etiologic agent is desirable to estimate the size of the problem and to plan for prevention of transmission and spread of such infections with adequate measures.*
Materials and Methods*: The study was done on 125 clinically diagnosed cases of dermatophytosis which included skin scrapings, hair stubs and nail clippings. The collected samples were processed by direct microscopic examination and culture on Sabouraud's Dextrose agar slants containing actidione and gentamycin along with Dermatophyte test medium.*
Results*: Trichophyton rubrum 34(53.2%) was the commonest etiological agent isolated in majority of clinical types followed by Trichophyton mentagrophytes15(23.4%),T tonsurans5(7.8%),T verrucosum 4 (6.3%),M.gypseum 2(3.1%), T schoenleinii 2 (3.1%) and M audouinii 2 (3.1%)*
Conclusion: *The isolation and identification of dermatophytes is important for an early diagnosis and treatment.*
Key Word*: Dermatophytes, Fungal infection*

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I. Introduction

Superficial fungal infections are the most common skin diseases affecting millions of people throughout the world.[1] Dermatophytosis constitute a group of superficial fungal infections of the keratinized tissues. The causative agents of dermatophytosis, dermatophytes are by far the most significant fungi because of the widespread involvement of population at large and their prevalence all over the world.[2] The estimated lifetime risk of acquiring a dermatophyte infection is between 10 and 20 percent.[1]

About 25 species belonging to the genera Epidermophyton, Microsporum and Trichophyton are presently known to infect man.[3]

The distribution, frequency, and etiological agents of dermatophytosis vary according to the geographic region, the climatic variations, the socioeconomic level of population, the time of study and age of the individual.[3]

Although dermatophytosis does not cause mortality, it does cause morbidity and poses a major cosmetic concern.[4]

The present study was undertaken to isolate and identify the species causing dermatophyte infections in patients and to correlate between the site of involvement and the causative agent.

II. Material And Methods

The present study was done on 125 clinically diagnosed cases of dermatophytosis from the Department of Dermatology at a Government General Hospital. The study was conducted over a period of one year.

Study Design: Descriptive study
Inclusion criteria:
New clinically diagnosed cases of dermatophytosis

Exclusion criteria:
1.Patients under antifungal treatment
2.Patients with secondary infections
3.Patients with systemic illness

Procedure methodology

An informed consent was taken from all the patients. A detailed history of selected cases was taken in relation to name, age, sex, address, occupation, duration of illness, and involvement of more than one site. Clinical examination was made in good light with special attention to the site of lesion, number of lesions, types, presence of inflammatory margin, etc.

Skin scrapings, nail clippings and hair stubs from these 125 selected cases were collected. The site of lesion was cleaned thoroughly with 70% alcohol and allowed to dry. The edges of the lesion were selected for scraping, as the edge is the active part of the lesion. Skin scrapings were taken with the help of a scalpel blade with the blunt edge facing the lesion. The scrapings were collected onto a sterile piece of paper, folded appropriately for transport. Nail clippings were collected after cleaning the nails with 70% alcohol and allowed to dry. The deepest part of the nail was clipped with a nail clipper. Nail clippings along with nail debris was collected onto a sterile paper. The affected hairs were epilated in scalp lesions with the help of forceps and collected onto a sterile piece of paper. The samples collected were processed for direct microscopic examination and fungal culture in the Department of Microbiology.

Direct microscopic examination: The samples were emulsified in a drop of 10-20% potassium hydroxide (KOH) preparation and the slides were examined under light microscope. Hyaline branching septate hyphae and arthrospores were identified.

Fungal culture: All the samples were inoculated into two culture media slants- Sabouraud's Dextrose Agar (SDA) with Actidione and Gentamycin tubes and dermatophyte test medium (DTM). Incubation was done at room temperature (22°C to 30°C) for SDA tubes and 28°C for DTM tubes. The growth was observed starting from 3rd day onwards. The fungal isolate was identified based on colony morphology, pigmentation, growth rate, microscopy (LPCB), slide culture, urease test and hair perforation test. If no growth was found after 30 days it was taken as negative for fungal growth. Slants contaminated by bacteria or saprophytic fungi in the first few days of inoculation were discarded.

Statistical analysis

Statistical analyses was performed by using MS excel 2010. Descriptive statistical data is expressed as percentages and graphically represented.

III. Result

A total of 125 clinically diagnosed cases of dermatophytosis were included in the study. The specimens collected include 99 skin scrapings, 18 nail clippings and 8 hair stubs.

32% of cases were in the age group of 21-30 years and 24% in 11-20years age group.[Table 1]

There were 64% males and 36% females. About 65.6% of these patients were in the low-income group.

Table no 1: Age wise distribution in the study group

Age(years)	Percentage
0-10	7.2%
11-20	24%
21-30	32%
31-40	16%
41-50	8.8%
51-60	7.2%
61-70	4.8%

Of these 125 patients, 58(46.4%) had tinea corporis,19(15.2%) had tinea cruris,18(14.4%) had tinea unguium,11(8.8%) had infection at more than one site,8(6.4%) had tinea capitis ,6(4.8%) had tinea faciei,3(2.4%) had tinea mannum and 2(1.6%) had tinea pedis.[Table 2]

Table no 2: Distribution of clinical types

Clinical Type	Total
T corporis	46.4%
T cruris	15.2%
T unguium	14.4%
T capitis	6.4%
T pedis	1.6%
T faciei	4.8%
T mannum	2.4%
Mixed	8.8%
Total	100%

Fungal elements by direct microscopy was positive in 78 samples (62.4%) but culture was positive for dermatophytes in only 64 (51.2%) samples.

Trichophyton was the predominant organism causing dermatophytosis in 60 cases with Trichophyton rubrum constituting 53.2% cases, Trichophyton mentagrophytes 23.4%, T tonsurans 7.8% , T verrucosum 6.3% and T schoenleinii 3.1%. Microsporum gypseum and Microsporum audouinii were isolated in 3.1% of cases each.[Table 3]

Table no 3: Incidence of dermatophytes species wise

Dermatophye species	Percentage
Trichophyton rubrum	53.2%
Trichophyton mentagrophytes	23.4%
Trichophyton tonsurans	7.8%
Trichophyton schoenleinii	3.1%
Trichophyton verrucosum	6.3%
Microsporum audouinii	3.1%
Microsporum gypseum	3.1%

Among 58 clinically diagnosed cases of tinea corporis, dermatophytes were isolated in only 35 cases. T rubrum was the causative agent in 20 cases followed by T mentagrophytes in 10 cases and T tonsurans in 4 cases. The most common causative agent of tinea cruris was T rubrum followed by T mentagrophytes.

Out of 18 cases of tinea unguium, dermatophytes were isolated in only 6 cases with T rubrum and T verrucosum in 2 cases each and M audouinii and T schoenleinii in 1 case each.

In cases of Tinea capitis, T verrucosum and M gypseum were the common causative agents.

In mixed infections,T rubrum was the most common etiological agent. [Table 4]

Table no 4: Dermatophytes isolated from different clinical types

Clinical Types	**No of samples**	**T rubrum**	**T mentagrophytes**	**T tonsurans**	**T verrucosum**	**T schoenleinii**	**M audouinii**	**M gypseum**	**Total**
Tinea corporis	58	20	10	4	0	1	0	0	**35**
Tinea cruris	19	6	2	0	0	0	0	0	**8**
Tinea unguium	18	2	0	0	2	1	1	0	**6**
Tinea capitis	8	0	0	0	2	0	1	2	**5**
Tinea pedis	2	1	0	0	0	0	0	0	**1**
Tinea faciei	6	0	1	1	0	0	0	0	**2**
Tinea mannum	3	1	0	0	0	0	0	0	**1**
Mixed	11	4	2	0	0	0	0	0	**6**
Total	**125**	**34**	**15**	**5**	**4**	**2**	**2**	**2**	**64**

IV. Discussion

The present study shows that dermatophytosis was more common in the age group of 21-30years (32%) followed by 11-20years (24%) and 31-40years (16%) which is comparable with studies done by Nita Patwardhan et al[5], Mohanty JC et al [6] , Niranjan et al [7] , Madhavi S et al [8] and Hanumanthappa H et al [9] .This may be explained by the fact that this population group was highly active and takes part in maximum outdoor activities like agriculture and manual activities. [10]

Male to female ratio was 1.78:1 which is comparable with studies done by Nita Patwardhan et al [5], Singh S et al [11], Niranjan et al [7] and Neetu Jain et al [12]. The higher incidence in males may be due to greater physical activity, increased sweating and due to the type of footwear they use.[13]

In the present study, tinea corporis was the commonest clinical type encountered (46.4%) followed by tinea cruris(15.2%) and tinea unguium(14.4%).This is comparable with the study done by SS Sen et al [14] and Bindu V et al.[13] Exercise, crowded places, low degree of personal hygiene, sitting at a desk and driving for a long hours may be the major causes contributing to tinea corporis and tine cruris. [45] Walking bare foot, wearing ill-fitting shoes, nail biting(onychophagia), working with chemicals further predispose Indian patients to tinea unguium infections.

Tinea capitis (6.4%) was more commonly seen in the age group below 10years. Higher occurrence of tinea capitis in this group may be due to lack of fungistatic secretion by scalp in childhood and close contact with each other when compared to adults.[3]

Tinea pedis constitutes only1.6% of total cases. The lower incidence in this study might be due to lack of health awareness and illiteracy.

Out of 125 clinically diagnosed cases of dermatophytosis,78 samples(62.4%) were positive for fungi by direct microscopy and 64 (51.2%) were positive by culture. This variation could be due to non-viability of fungal elements in some cases or inappropriate use of antimycotic treatments and self-medication before consultation.[3]

Trichophyton rubrum 34(53.2%) was the commonest etiological agent isolated in majority of clinical types in the present study followed by Trichophyton mentagrophytes 15(23.4%. Ranganathan S et al [16] reported T rubrum (52.2%) as the commonest isolate followed by T mentagrophytes (29.35%) which is in accordance with the present study.

Out of 5 isolates from T capitis, two were Microsporum gypseum, two Trichophyton verrucosum and one M audouinii. This 3.1% isolation rate of Microsporum gypseum is in accordance with the study of Smita Sarma et al [17](3.27%). The isolation of M gypseum could be accounted to the patient's interaction with soil and domestic animals. Epidermophyton floccosum was not isolated in our study.

V. Conclusion

The nature of dermatophytosis is varied in different places as reported by different authors. These differences may be due to the changes in the environment and more physical activity due to urbanization, occupation, change in dressing habits and use of immunosuppressive drugs and chronic debilitating diseases.

Isolation and identification of dermatophytes is important for an early diagnosis to prevent transmission of the infection and for prompt treatment. Awareness on the importance of general health and better hygienic practices may be the possible preventive measures.

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