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Mycological profile of dermatophytosis in patient attending a tertiary care hospital

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Abstract

Dermatophytosis is superficial fungal infections caused by Dermatophytes, a group of fungi that are capable of invading the keratin of skin, hair and nails and this included Trichophyton, Microsporum and Epidermophyton.

Objectives

1. To determine prevalence and to identify the etiological agent causing Dermatophytosis in tertiary care hospital.

Material and Methods: This is an observational study conducted in the department of Microbiology. A total of 74 samples from patients clinically suspected to have Dermatophytosis were collected and transported to Microbiology laboratory. Direct examination for fungal element was done using 10% KOH for skin and hair, and 40% KOH for nail sample. Culture was done on Sabouraud's dextrose agar with gentamicin, cycloheximide and Dermatophyte Test medium.

Result: Out of 74 clinically suspected cases, 42(56.75%) were culture positive and 44(59.45%) were KOH positive for fungal element. More number of cases were observed between age group of 31-40 yr. Tinea corporis was more common clinical presentation. Trichophyton mentagrophyte was the common isolate recovered.

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.

Keywords: Dermatophyte, tinea corporis, trichophyton, Sabouraud's dextrose agar

Introduction

Dermatophytosis is a common clinical entity causing infection of keratinised tissue by a group of fungi called dermatophytes [1]. Dermatophytosis is caused by a group of closely related keratinophilic fungi, capable of invading keratinized tissues of skin and its appendages [2, 3]. They use keratin as nitrogen source [4]. Its high prevalence in India is due to favourable climatic conditions like high temperature and air humidity. This climate retards sweat evaporation due to high environmental moisture content, thus facilitating fungal dispersion and development. Overcrowding, poor hygiene, low standard of living, humidity, increasing use of medication, etc all are contributing the increase prevalence of dermatophytosis. There is increase in incidence of development of resistance to commonly used antifungal drugs. Aim of this study was to determine the prevalence of various etiological agents of dermatophytosis in skin outpatient department of a tertiary care hospital.

Aims and Objectives

1. To determine the prevalence of Dermatophytosis in tertiary care hospital.
2. To identify the etiological agent causing Dermatophytosis in tertiary care hospital.

Material and Methods

A total of 74 samples from clinically suspected patients of dermatophytosis attending dermatology OPD of Dr. PDMMC, Amravati were collected for period of one year from Jan 2018 to Dec. 2018. A detailed history regarding age, sex, occupation, social status, duration of complaints and other were taken. Before collection of sample, patient was explained about the procedure and informed consent was taken.

Collection of samples

Samples were collected after cleaning the affected surface with 70% alcohol. From skin lesion, scales were collected from erythematous growing margin with sterile blunt scalpel. Hairs were plucked with sterile surgical forceps. Nail clipping were taken from infected nail bed & from under surface of nail as proximal to cuticle with a no. 15 scalpel blade. These samples were collected in black sterilised Whatman paper and transported to the microbiology laboratory.

Direct Microscopy

Direct examination of fungal elements was done by using 10% KOH for skin scrapping & Hair on a clean glass slide, preparation was kept aside for 30 minutes, then observed microscopically (400X magnification), Nail samples were placed in 40% KOH solution and observed. In case of very thick nail specimens, preparation was kept in a moist chamber and observed next day.

Isolation by culture

All samples were cultured on 2 sets of Sabouraud's dextrose agar with actidione & Dermatophyte test medium (Himedia). One set was incubated at 37 °C and other 25 °C in BOD (Biological Oxygen Demand) incubator. Tubes were observed for growth at least twice during the first week, and once a week thereafter, for a total of 4 weeks & were incubated for 4 weeks before discarding them as negative. Fungal growth was identified by colony morphology, pigment production, tease mount in LPCB, confirmatory biochemical reactions were also performed for identification of agent.



Fig 1: Growth of Dermatophyte on DTM



Fig 2: *Microsporum canis*

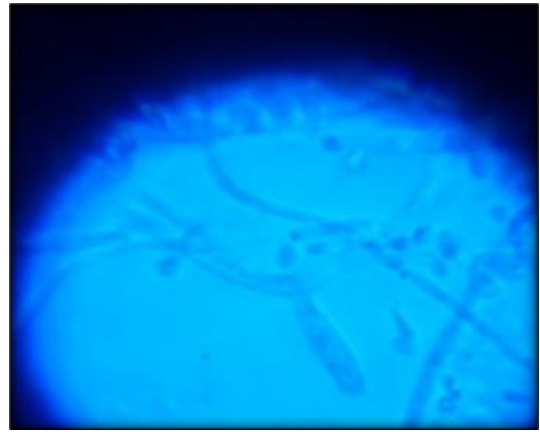


Fig 3: *Trichophyton tonsurans*



Fig 4: *Trichophyton mentagrophytes*



Fig 5: *Trichophyton rubrum*



Fig 6: *Microsporum gypseum*

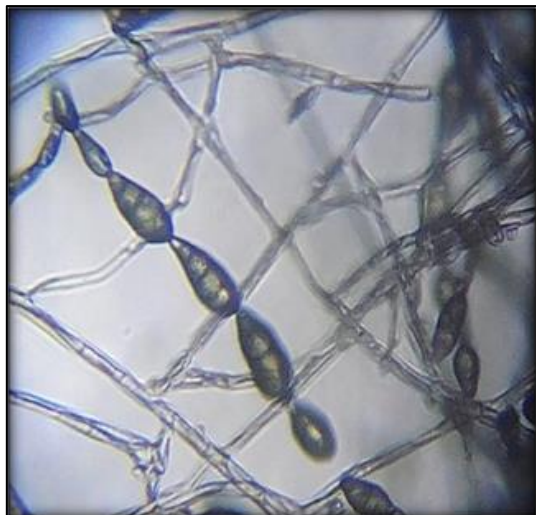


Fig 7: Slide culture of *Microsporum gypseum*

Result and Discussion

In this study, out of 74 clinically suspected cases, sample from 42 (56.75%) were culture positive. More number of cases were observed between age group of 31-40 yr. And in males 42(56.7%) than female 32(43.2%), due to greater physical activity and increased sweating in this age group. This correlates well with the study done by Komal D Patel *et al.* at Ahmedabad (2015) [5], C. Roopa *et al.* at Karnataka (2015) [6].

In the present study, Tinea corporis (45.9%) was the commonest clinical presentation followed by Tinea cruris (20.2%). It is consistent with the study done by Madhavi *et al.* (2011) at Hyderabad [7], N Patwardhan *et al.* (1999) at Aurangabad [8]. Trichophyton mentagrophytes (45.4%) was the commonest dermatophyte isolate in this study which is consistent with the study done by R K Agrawal *et al.* (2015) at Dehradun, Jha BK *et al.* (2015) [14] at Bharatpur, Nepal.

Table 1: Age wise distribution of cases of Dermatophytosis

Age (yrs.)	Total
Below 20	12 (16.2%)
21-30	17 (22.9%)
31-40	21 (28.3%)
41-50	13 (17.5%)
51-60	03 (4.05%)
61-70	04 (5.4%)
above 70	04 (5.4%)
Total	74

Table 2: Sex wise distribution of cases of Dermatophytosis

Sex	Total
Male	42 (56.7%)
Female	32 (43.2%)
Total	74

Table 3: Clinical presentation of Dermatophytosis

Clinical types	No. of cases	Percentage (%)
<i>Tinea Corporis</i>	34	45.9%
<i>Tinea Cruris</i>	15	20.2%
<i>Tinea faciei</i>	09	12.16%
<i>Tinea unguium/Onychomycosis</i>	07	9.45%
<i>Tinea Pedis</i>	06	8.10%
<i>Tinea versicolor</i>	03	4.05%
Total	74	

Table 4: Dermatophytes species isolated

Dermatophyte species	No. of species	Percentage (%)
<i>Trichophyton mentagrophytes</i>	20	45.4%
<i>Trichophyton rubrum</i>	14	31.8%
<i>Microsporum gypseum</i>	04	9.09%
<i>Microsporum canis</i>	04	9.09%
<i>Trichophyton tonsurans</i>	02	4.54%
Total	44	

Table 5: Microscopy and culture positivity of fungal isolate

	No. of samples	Percentage (%)
Total KOH +ve	44	59.45%
Total culture +ve	42	56.75%
KOH +ve Culture -ve	04	5.40%

In this study, 44 (59.45%) isolates were positive on direct KOH examination and 42(56.75%) isolates were culture positive. Our KOH positivity was 59.45% which is almost near to study done by Singh S *et al.* (2003) at Baroda [9], V Bindu *et al.* (2002) at Calicut [10]. In this study culture positivity was 56.75% which is near to other workers e.g. Jain Neetu *et al.* (2008) at Jaipur [11], Komal D *et al.* (2015) at Ahmedabad [5].

Summary and Conclusion

Prevalence of clinically diagnosed cases of dermatophytosis was 0.7% during the study period from Jan 2018 to Dec 2018. Males & most of the cases in age group 31-40 yr. were more prone for Dermatophytosis. Tinea corporis was the most common clinical presentation. Trichophyton mentagrophyte was the most commonly isolated dermatophyte. Out of 74 clinically suspected cases of dermatophytosis, 44(59.45%) were KOH positive and 42(56.75%) were culture positive. In conclusion, dermatophytosis is the commonly encounter fungal infection in developing countries like India. Effective control of dermatophytes will necessitate knowledge of occurrence & emergence of different species from time to time.

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