

MYCOLOGICAL STUDY OF DERMATOPHYTOSIS IN 100 CLINICAL SAMPLES OF SKIN, HAIR AND NAIL

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Received: 20 July 2013, Revised and Accepted: 26 Aug 2013

ABSTRACT

Objective: To conduct mycological study of dermatophytosis in 100 clinical samples of skin, hair and nail.

Materials and Methods: Direct microscopy of 100 samples of skin, hair and nail in KOH solution and culture on SDA medium with cycloheximide was done. Species identification of causative dermatophytes was done by colony characters and LCB mount. Results: Direct microscopy was positive in 60% cases and culture was positive in 49% cases. Amongst cultural isolates *T. rubrum* (61.2%) was found to be commonest etiological agent followed by *T. mentagrophytes* (24.48%), *T. tonsurans* (6.1%), *E. floccosum* 4.1% and *T. violaceum* 2%. *T. cruris* is most common clinical type (40%). Commonest age group affected was 21-30 (34%). Males were predominantly affected (62%). Male to female ratio being 1.63 :1. 53% of patients came from urban background compared to 47% from rural areas. Housewives formed the largest group at 22% followed by laborers (17%) and farmers (16%). A positive family history was seen in 12% of cases. 12% of cases had associated diseases.

INTRODUCTION

The dermatophytes are a group of closely related fungi that have the capacity to invade keratinized tissues (skin, hair and nails) of human and other animals to produce an infection, dermatophytosis, commonly referred to as 'ringworm'[1]. Dermatophytoses are more prevalent in India, due to favorable climatic conditions like temperature and humidity[2]. The etiological agents of dermatophytoses are classified in three anamorphic (asexual or imperfect) genera- Epidermophyton, Microsporum, and Trichophyton, of anamorphic class Hyphomycetes of the Deuteromycota (Fungi Imperfecti)[3]. Traditionally, infections caused by dermatophytes (Ringworm) have been named according to the anatomical locations involved, by appending the Latin term designating the body site after the word tinea[4]

Dermatophytosis is a major public health problem in the world today. The disease is more frequent among men than women. Several factors have been implicated to increase in disease such as trauma, increased sweating and diabetes [5].

Aims

- To determine the incidence, contributing factors, associated diseases & occupational consequences related to dermatophytoses.
- To isolate the causative dermatophytes.

MATERIALS & METHODS

Subjects

The study population comprised of 100 clinical suspected cases of dermatophytoses attending Skin & VD, Outpatient Department of Rajindra Hospital, Patiala. Detailed history of onset of disease, duration, trauma, occupation, drugs, associated disease, family & personal history was taken.

Collection and processing of samples

Appropriate material i.e. skin scrapings, hair or nail clippings will be taken according to the site involved. Out of the material collected, part of it was used for direct KOH examination and remaining part was used to inoculate SDA medium for culture to isolate causative dermatophyte.

KOH examination

Skin & hair specimens were subjected to 10% KOH solution. Preparation was kept at room temperature for 30 minutes. Nail clippings were kept overnight in 40% KOH. Then it was examined under low power of the microscope (10X) for branching and septate hyphae and confirmation was made under 40X of microscope.

Culture

Skin, nail and hair samples were inoculated after reducing the size to approximately 1mm. Material was inoculated at 4 sites at well spaced intervals onto Sabouraud's dextrose agar slant containing

0.05 mg/ml chloramphenicol and 0.5 mg/ml cycloheximide[6]. Chloramphenicol was added to inhibit the bacterial growth and cycloheximide was added to inhibit the growth of saprophytic fungi. Then tubes were incubated in BOD incubator at 28°C and were examined daily up to 4 weeks for evidence of growth from the edge of the plated material. If no growth appeared, results were declared negative after 4 weeks of incubation.

Identification of the dermatophytes

Growth, if and when appeared, was identified from culture characters, colonial morphology, pigment production on the underside of growth and production of microconidia and macroconidia by making LCB mount.

RESULTS

According to site of involvement, out of 100 clinically diagnosed cases of dermatophytosis, tinea cruris was the most common clinical type with 40 cases. Of these 100 cases, 62% were male & 38% were females, male to female ratio being 1.63:1. The commonest age group was 21-30 years (34%) followed by 31-40 (27%).

Table 1: Distribution of 100 cases according to age & sex

Age	Male	Female	Total
0-10	2	3	5
11-20	7	4	11
21-30	23	11	34
31-40	16	11	27
41-50	4	5	9
51-60	4	3	7
61-70	4	1	5
70/>	2	—	2
Total	62	38	100

Dermatophytoses was found to be commonest in housewives (22%) followed by laborers (17%) & farmers (16%).

Of these 100 cases, 60 were positive by direct microscopy & 49 were culture positive.

Table 2: Microscopy & culture positivity of 100 clinical samples

	Samples
Total KOH -ve	60
KOH -ve culture -ve	18
Culture -ve KOH -ve	07
Total culture-ve	49
Both -ve	42
Both -ve	33

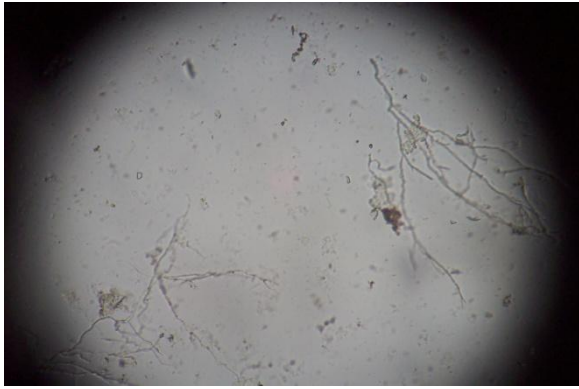


Fig. 1: Positive KOH mount of nail showing hyphae under high power microscope

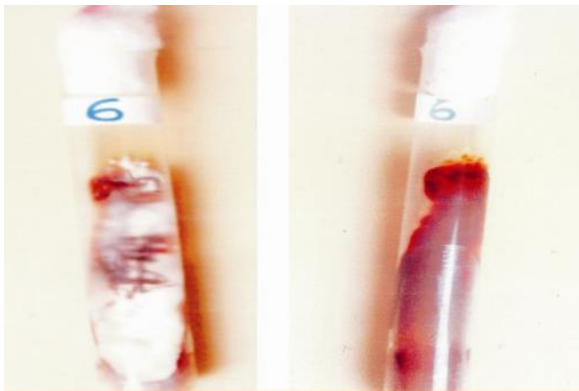


Fig. 2: Culture tube showing growth of *T. rubrum*

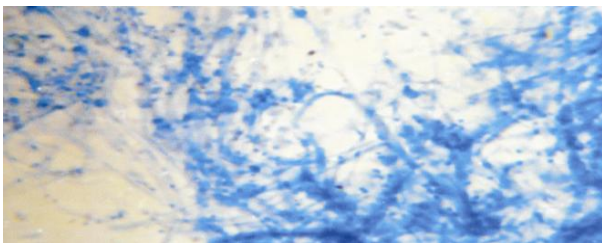


Fig. 3: LCB MOUNT showing *T. rubrum* under High Power Microscope



Fig. 4: Culture tube showing growth of *T. mentagrophytes*

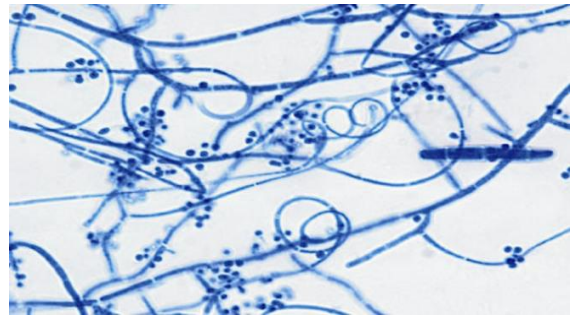


Fig. 5: LCB MOUNT showing *T. rubrum* under High Power Microscope



Fig. 6: Culture tube showing growth of *T. tonsurans*

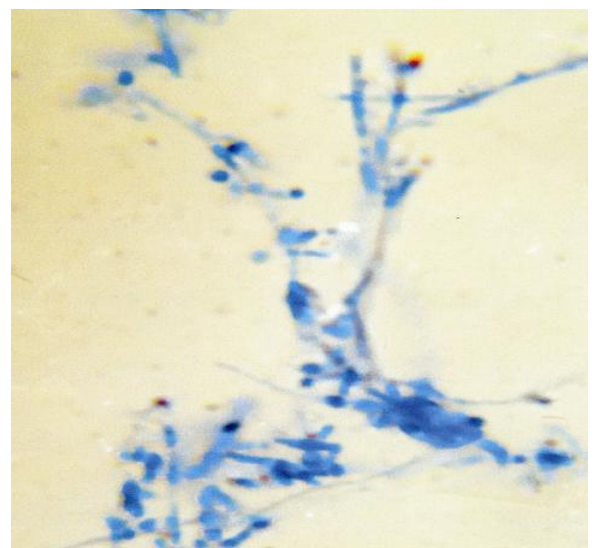


Fig. 7: LCB MOUNT showing *T. tonsurans* under High Power Microscope.

The most common fungal isolate was *T. rubrum* (61.2%) followed by *T. mentagrophytes* (24.48%), *T. tonsurans* 6.1%, *E. floccosum* 4.1% and *T. violaceum* 2%.

Table 3: Fungal isolates obtained from 100 clinical samples

Fungus	Isolate Percentage
T. rubrum	61.2
T. mentagrophytes	26.6
E. floccosum	6.1
T. tonsurans	4.1
T. violaceum	2.0

DISCUSSION

Dermatophytoses are widely prevalent in our part of world. In the present study, dermatophytosis was found to be commonest in the age group 21-30 years in accordance with most of studies [7].

Higher incidence was noted amongst males (62%) than females (32%), the ratio being 1.63:1, which compares well with most of the studies. Higher incidence in males may be because they are exposed to outdoors with greater physical activity & more prone to trauma [8].

53% of patients came from urban background compared to 47% from rural areas which can be explained that urban patients seek medical attentions sooner due to more awareness and easy accessibility of medical care [9].

Housewives formed a major chunk with cases (22%) followed by laborers with cases (17%) & farmers with cases (16%) in accordance with most of studies [9,10]

55 % cases had duration of disease more than 6 months. So we see that fungal infections of skin, hair and nail have a chronic character [11]

12 % cases reported a positive family history matches well with other studies [12]

In predisposing factors, 5 cases of tinea pedis wore occlusive footwear, 4 cases of tinea cruris wore occlusive clothing and 4 cases of tinea unguium had wet occupations and 5 cases were using oral/topical corticosteroids [12,13]

In our study, most common association was found with atopy (4 cases) followed by diabetes mellitus (4 cases), atopic dermatitis (2 cases), pulmonary tuberculosis (1 case)[13] Concomitant tinea infection was seen in 18% cases[14].

Of these 100 cases, 60 were positive by direct microscopy & 49 were culture positive[15].

Tinea cruris (40 cases) was observed to be the most common type followed by T. corporis. These results corroborated by most studies[16].

The most common fungal isolate was T. rubrum (61.2%) followed by T. mentargophytes (24.5%), T. tonsurans 6.1%, E.floccosum 4.1%

and T. violaceum 2%. Overall, Trichophyton was the most common genus at 95.9% in accordance with other studies[17,18].

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