Isolation, Identification and Prevalence of Dermatophytes in Tertiary Care Hospital in Gulbarga District.

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Abstract:
Dermatophytosis is one of the most commonly encountered cutaneous fungal infections worldwide. The higher prevalence in tropical and subtropical areas is supposedly due to the hot and humid climatic condition. Other factors like personal hygiene and habits, prevalence of virulent species in the soil are also known to influence the infection. A high prevalence of dermatophytoses has been reported from India. Hence, this study was undertaken to identify, speciate and study the sensitivity pattern of dermatophytosis from clinical samples received at Basveshwar Teaching & General Hospital, Gulbarga.

A total of two hundred clinically diagnosed randomly selected patients of dermatophytosis attending the out patient department of Dermatology and Venereology, Basveshwar Teaching & General Hospital & M.R. Medical College, Gulbarga were studied. Skin, nail and hair specimens taken from the patients were processed by potassium hydroxide preparation (KOH) for direct microscopy and culture.

Dermatophytosis was more common in the age group of 21-30 years (36%) and in males (73%). Fungi was demonstrated in 130 cases by KOH and in 96 cases by culture; 78 cases were positive by both direct examination and culture. Tinea corporis was the commonest clinical type encountered (54.5%) followed by tinea cruris (25.5%). Tricophyton rubrum (46.87%) was the commonest aetiological agent in majority of clinical types followed by Trichophyton mentagrophytes (36.46%), Microsporum gypseum (4.16%), Trichophyton tonsurans (1.04%), Epidemophyton floccosum (8.33%), Microsporum audouinii (2.08%) and Trichophyton violecium (1.04%).

Dermatophyte infections are very common in our country where hot and humid climate along with poor hygienic conditions play an important role in the growth of these fungi. By and large, Trichophyton species forms the commonest etiological agent of dermatophytosis. Tinea rubrum was the commonest isolate in tinea corporis, tinea cruris and Onychomycosis. Microsporum audouinii was isolated from 1 case of tinea capitis.

Key Words: Dermatophytes, Dermatophytosis, Tinea corporis, Tinea cruris, T. rubrum.

Introduction:
Dermatophytosis are the most common types of cutaneous fungal infections seen in man affecting skin, hair, and nails, in both developed and developing countries due to advent of immunosuppressive drugs and diseases. Hot and humid climate in the tropical and subtropical countries like India makes dermatophytosis or ringworm infection as a very common superficial fungal infection (Singh & Beena, 2003). The dermatophytes are keratinophilic fungus, which causes dermatophytosis by virtue of their unique ability to degrade keratin and thus colonize and invade the skin and its appendages.

Depression of cellular immunity due to various factors such as malignancy, administration of steroids or immunosuppressive drugs, endocrine disorders such as Cushing’s disease, can lead to atypical generalised invasive dermatophyte infection. Early identification and treatment is essential as once infection is established, the individual becomes carrier and more susceptible to recurrence (Padhye & Weitzman, 1998).

Any clinical diagnosis need to be supported by laboratory diagnosis. Culture is a necessary adjunct to direct microscopic examination for definitive identification of etiological agent. In many instances the choice of therapy may depend upon the specific identification of invasive mould. This is especially important in the nail and skin infection, often caused by non-dermatophytic filamentous fungi which are often resistant to usual dosage of the therapy used for dermatophytic infection (Padhye & Weitzman, 1998).

Rapid identification of dermatophyte species and knowledge of their host preference and ecology play an important role in epidemiology, public health issue and infection control. The varied clinical presentation of tinea, which results in delay in diagnosis, poor compliance in follow up of cases, and consequently
spread of infection in the community had rekindled interest in rapid diagnostic method in identification of species (Padhye & Weitzman, 1998).

**Material and Methods:**

Two hundred clinically diagnosed cases of Tinea attending the Dermatology & Venerology O.P.D at Basaveshwar Teaching and General Hospital & M.R. Medical College, Gulbarga were included in the study.

Depending on the clinical types and lesions, specimens comprised of skin scrapings, nail scrapes / clippings and infected hair stubs. These samples were collected and processed as per standard guidelines (Padhye & Weitzman, 1998; Chander, 2000).

Following culture procedures and tests were carried out for identification and specification of dermatophytes (Padhye & Weitzman, 1998; Hay & Ashbee, 2010; Emmons et al, 1970; Rippons, 1988).

1. **Direct Microscopic examination (KOH mount; Chander, 2009)**
2. **Culture:** Specimens were then cultured irrespective of KOH findings. 3 sets of medium were used: a) Sabourauds dextrose agar (Modified); b) Sabourauds dextrose agar with cycloheximide and chloramphenicol are incorporated to avoid contamination with saprophytic fungi and bacteria; c) Dermatophyte test medium
3. **Other test performed were:** Lacto phenol cotton blue mount; Slide culture technique (Riddel Slide culture Method); Urease Test; Rice Grain Test and Hair perforation test.

**Results:**

The highest incidence was found in the age group of 21-30 years followed by age group of 11-20 years. Tinea corporis and Tinea cruris infections were also maximum in this age group. Male and female ratio was approximately 2.7:1. Incidence of tinea cruris was found to be very low in females (3.9%).

**Clinical types:** Tinea corporis formed the major group (54.5%), followed by tinea cruris (25.5%), onychomycosis (9.5%), tinea pedis (6%), tinea barbae and tinea manuum (2%). Tinea capitis (0.5%) was the least common type (Table I).

**Microscopy and culture:** Out of the 200 cases of dermatophytosis, 130 were positive in direct examination (KOH) and a total of 96 were positive by culture. 78 cases were positive in direct examination (KOH) as well as in culture. In 18 cases, even though direct examination was negative, they were positive by culture. 52 cases were negative both in direct examination and culture (Table II).

**Clinical type and aetiological agents:** Out of the 176 cases of skin scrapings, 88 (50%) were positive in culture. All the hair samples 5 (100%) yielded positive culture. Out of the 19 nail samples from onychomycoses cases only 3 yielded positive growth (Table III).

Majority of the isolates belong to the Trichophyton species. Trichophyton rubrum was found in 46.8% followed by T. mentagrophyte (36.46%), E. floccosum (8.3%), M. gypseum (4.16%), M. audouinii (2.08%); T. tonsurans and T. violeum were found in 1.04% each (Table V).

The detailed of the clinical type and their relation to the aetiological agents are shown in table IV. Most of the Tinea corporis cases were found to be due to T. rubrum and T. mentagrophyte. Other species were E. floccosum, M. gypseum and T tonsurans. Tinea cruris was mostly caused by T. rubrum, T. mentagrophyte and E. floccosum. Species isolated from tinea pedis, tinea manuum and tinea unguium were T. rubrum and from tinea capitis was M. audouinii.

**Discussion:**

The present study revealed that dermatophytosis is more common in the age group of 21-30 years (36%) followed by 11-20 years (19%), which is in accordance with studies of Jesudanam et al (2002), Sen & Rasul (2006) and Mishra et al (1998).
However, Veer et al. (2007) has reported that the most common age group affected was 31-40 years followed by 41-50 years. The highest incidence in young adults aged 21-30 years may be due to increased physical activity and increased chances of exposure to infection.

In the present study, males (73%) were more frequently affected than females (27%). The male to female ratio was 2.7:1. Out of 200 clinically diagnosed cases of dermatophytosis, 130 cases were positive for fungi by KOH. Seventy eight cases were positive by both KOH and culture, 52 cases were positive by KOH but culture negative, 52 cases were negative by both KOH but culture, which is comparable with the study of Singh & Beena (2003). KOH positive and culture negative could be due to non-viability of fungal elements in some cases.

In the present study T. rubrum (46.87%) was the commonest aetiological agent in majority of clinical types followed by T. mentagrophytes (36.46%), E. floccosum (8.33%), M. gypseum (4.16%). In tinea capitis, M. audouinii was isolated in 1 case, which was not isolated in studies by Bindu & Pavithran (2002) and Venkatesan et al (2007). However, Karmakar et al. (1995) and Fathi & al-Samarai (2000) in their study, reported T. violaceum and T. verrucosum as the predominant isolates respectively.

### Conclusion:

Dermatophyte infections are very common in our country where hot and humid climate in association with poor hygienic conditions play an important role in the growth of these fungi. There is a difference in isolation of different species from southern and northern part of India. By and large, Trichophyton species form the commonest aetiological agent of dermatophytosis.

All the clinically diagnosed fungal infections need to be confirmed by laboratory diagnosis for proper treatment of fungal infection and to know the prevalence of particular dermatophyte.
References: