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Isolation and characterization of dermatophytes with tinea infections at gwalior (m.p.), india

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ABSTRACT*:The present study determines the incidence of tinea infections and their dermatophytes in Gwalior (M.P.). Out of 83 samples with various infections 85.5 % were infected with dermatophytes. Among them, Tinea corporis was the highest, followed by tinea capitis. The total number of dermatophytes were 71, in which 10 species were identified. Trichophyton rubrum (42.3 %) was the most frequently isolated dermatophyte and the common cause of tinea corporis (18.3 %) and tinea pedis (12.7 %). The agents other than dermatophytes are Chrysosporum tropicum and Candida albicans (14.5 %).*

Keywords: *dermatophytes, tinea, infections, incidence, Trichophyton*

I. INTRODUCTION

Mycotic infections causes a wide range of diseases in humans. They are world wide in distribution but more prevalent in tropical countries like India, where temperature and humidity are more favorable for there act and persistence[1,2]. Tinea is caused by dermatophytes, a group of keratinophilic fungi that require long incubation period to grow. The clinical presentation, though very typical of ringworm infection, is very often confused with other skin disorders particularly due to rampant application of broad-spectrum steroid containing skin ointments and creams leading to further misdiagnosis and mismanagement [3].
The present study will be helpful in determining the incidence of the most prevalent fungi causing tinea infections in patients and provides information about the cases in district Gwalior (M.P.) and the site affected in human beings.

II. MATERIALS AND METHOD

2.1 Sample Collection

A total of 83 samples were collected from suspected cases of tinea from Cancer Hospital, Gwalior (M.P.). The affected area was cleaned with 70 % ethanol and skin scales, pieces of nails or hairs were collected on a sterile container for diagnosis and culture identification.

2.2 Direct Examination

A small sample was selected for direct microscopic examination for the presence of fungal elements and mounted by using 20% Potassium Hydroxide (KOH) and slides were gently heated to dissolve the sample cells.

2.3 Mycological Cultures

Cultures were performed by Standard methods, using Sabouraud's Dextrose Agar, Bromocresol purple media, Rice grain medium and Urease agar.

2.4 Outcome criteria

The isolates were examined macroscopically and microscopically following staining with lactophenol cotton blue and by *in vitro* tests, as described by Kwon-Chung and Bennett [4].

III. RESULTS AND DISCUSSION

Among the 83 patients from suspected tinea infections, the dermatophytes were the most prevalent and isolated from 71 cases (85.5 %). C*hrysosporum tropicum* and *Candida albicans* were the next common fungi, isolated in 1 case (1.2 %) and 11 cases (13.2 %) respectively.

As shown in Table I, the total number of tinea infections consisted of 25 cases (35.2%) of tinea corporis, 18 cases (25.3 %) of tinea capitis, 12 cases (17%) of tinea pedis, 6 cases (8.4%) of tinea cruris, 5 cases (7.1%) of tinea unguium, 3 cases (4.2 %) of tinea manuum and 2 cases (2.8%) of tinea barbae. Sberna *et al.* [5] also recorded tinea corporis as the predominant dermatophytes in Italy.

According to data presented in Table II, *T. rubrum* and *T. mentagrophytes* were the most commonly isolated causative agent and reported in 30 cases (42.3 %) and 9 cases (12.7 %) respectively. Most studies also found *T. rubrum* and *T. mentagrophytes* as the commonest etiological agents of dermatomycosis in Udaipur region [6].

The dermatophytes spp. which causes tinea infections is shown in Table III. The leading agent of tinea capitis is *T. schoenlei*, other dermatophytes such as 3 cases of *Microsporum gypseum*, 2 cases each of *T. mentagrophytes*, *T.tonsurans*, *T. terrestre* and one case of *M. fulvum*, *M. audounii*, *T. verrucosum* and *T. violaceum* are also recovered. Tinea corporis (25) is due to a variety of etiologic agents which are *T.rubrum* (13 cases), *T. mentagrophytes* (3 cases), *T. violaceum* (2 cases) and *T. verrucosum* and *T. terrestre* (1 case).

Table I: Number and percentage of various tinea infections

Clinical diagnosis	*No. of cases*	*%*
Tinea corporis	**25**	**35.2**
Tinea capitis	**18**	**25.3**
Tinea pedis	**12**	**17**
Tinea cruris	**06**	**8.4**
Tinea unguim	**05**	**7.1**
Tinea manuum	**03**	**4.2**
Tinea barbae	**02**	**2.8**
Total	**71**	**100**

Table II: Causative dermatophytes in 71 patients with tinea infections

Species	*No. of isolates*	*%*
Trichophyton rubrum	**30**	**2.3**
Trichophyton mentagrophytes	**9**	**12.7**
Trichophyton violaceum	**7**	**9.8**
Microsporum gypseum	**7**	**9.8**
Trichophyton schloendein	**5**	**7**
Trichophyton tonsurans	**4**	**5.7**
Trichophyton terrestre	**4**	**5.7**
Microsporum fulvum	**2**	**2.8**
Trichophyton verrucosum	**2**	**2.8**
Microsporum audounii	**1**	**1.4**
Total	**71**	**85.5**

Table III. Number of dermatophyte species isolated from patients with tinea infections

Species	*Tinea capitis*	*Tinea corpis*	*Tinea pedis*	*Tinea unguium*	*Tinea manuum*	*Tinea cruris*	*Tinea barbae*
T .rubrum	**-**	**13**	**9**	**3**	**2**	**3**	**-**
T.mentag-rophytes	**2**	**3**	**2**	**1**	**-**	**-**	**1**
T.violaceum	**1**	**2**	**-**	**-**	**-**	**3**	**1**
M.gypseum	**3**	**4**	**-**	**-**	**-**	**-**	**-**
T.schoenlii	**5**	**-**	**-**	**-**	**-**	**-**	**-**
T.tonsurans	**2**	**-**	**-**	**1**	**1**	**-**	**-**
T.terrestre	**2**	**1**	**-**	**-**	**1**	**-**	**-**
T.verrucos-sum	**1**	**1**	**-**	**-**	**-**	**-**	**-**
M.fulvum	**1**	**1**	**-**	**-**	**-**	**-**	**-**
M.audounii	**1**	**-**	**-**	**-**	**-**	**-**	**-**
Total	**18**	**25**	**12**	**05**	**02**	**06**	**02**

T. rubrum, T. mentagrophytes and T. tonsurans are predominant in tinea unguium and tinea pedis. The causative agent of tinea manuum are T.rubrum and T. terrestre. Tinea cruris and tinea barbae are particularly prone to T.rubrum, T.violaceum and T.mentagrophytes, T. violaceum respectively.

T. rubrum (42.3%) was the most prevalent dermatophyte species isolated from 13 cases of tinea corporis and also isolated from 9 cases of tinea pedis, 3 cases of tinea unguium and tinea cruris and 2 cases of tinea mannum. T.rubrum has become one of the most common causative agents in tinea unguim, tinea corporis and tinea cruris [7,4] and is the principal agent causing tinea pedis in U.S.A, followed by T.mentagrophytes [8]. T. mentagrophytes (12.7%) was next to the T.rubrum and isolated from 3 cases of tinea corporis, 2 cases of tinea capitis and tinea pedis and one case of tine unguim and tinea barbae. These are similar to the results of Egypt who also recorded tinea corporis, tinea pedis and tinea unguium as the predominant dermatophytosis [9,10]. M.gypseum and T. violaceum were the third highest and isolated from 9.8 % of the cases. M.gypseum was isolated from 3 cases of tinea capitis and 4 cases of tinea corporis and T. violaceum was isolated from 3 cases of tinea cruris, 2 cases of tinea corporis and one case of tinea capitis and tinea barbae. T.schoenlii dominates in tinea capitis and reported in 5 cases.

Table III, shows that 2 cases of tinea capitis and 1 case of tinea corporis and tinea manuum were caused by T. terrestre. T. tonsurans was recovered from 2 cases of tinea capitis and one case of tinea pedis and tinea unguim. The incidence of this pathogen as a cause of tinea capitis is high in Mexico city and in the U.S.A [11,12]. M.fulvum and M. audounii were the least isolated dermatophytes from tinea capitis and tinea corporis.

IV. CONCLUSION

The conclusion emerged from this study demonstrate *T.rubrum* as the commonest frequently isolated etiological agent and tinea corporis as the most infectious, causing dermatophytosis. Isolation rate of all the dermatophytes have been observed to be much higher in this study and it can be concluded that isolation rate can be enhanced with aseptic and proper culture techniques.

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