Research Paper

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Isolation and Identification of Pathogenic Fungi Causing Superficial Infections in a Tertiary Care Hospital

MEDICAL SCIENCE

KEYWORDS : Superficial mycoses, Immunocompromised individuals, Potassium hydroxide (KOH), *Trichophyton rubrum*

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ABSTRACT

Background: Superficial mycoses (fungal infections) are common skin diseases affecting millions of people worldwide. This affects people of all age groups while common in immunocompromised individuals. Superficial mycoses are of two types namely surface mycoses and cutaneous mycoses. Present study was performed for the isolation and identification of fungal species from infected patients and to study prevalence of superficial mycoses. Methods: Clinical samples from 55 patients were subjected to potassium hydroxide (KOH) examination and culture isolation; causative agents were identified macroscopically and microscopically. Results: Based on the study the most common cause of Tinea pedis, Tinea corporis, Tinea cruris, Tinea faciei was identified to be Trichophyton rubrum. Other frequently implicated agents include Microsporum canis, Micrrosporum gypseum and Epidermophyton floccosum. Conclusion: Trichophyton spp was the common Dermatophyte in the study population and the predominant clinical presentation of Superficial mycoses is Tinea corporis.

Introduction:

Although fungi are worldwide, only few of them are considered pathogenic. The pathogenic fungi may give rise to infections in animals and human beings. Most of the agents cause infection of the superficial layers of the integument and only very few give rise to systemic involvement. Recently there has been an increase in the incidence of fungal infections. This increase may be a result of frequent usage of antibiotics, immunosuppressive drugs and various conditions like organ transplantations, lymphomas, leukemia and human immunodeficiency virus (HIV) infections.

Fungal infections may be classified as "Superficial" affecting only the skin, hair, nails and mucous membrane, or "Systemic" affecting the body as a whole. Fungal infections may also be described as "Local" when they are restricted to one body area, as "invasive" when there is spread into the tissue, or as "disseminated" when the infection has spread from primary site to other organs throughout the body[2].This study was undertaken for the following reasons, Common Dermatophytes in the study people can be identified up to species level with this study. In immunocompromised patients because the presentation is atypical this study will identify the fungal isolates in the lesions and aid in the clinical management. Positive microscopic findings of the hyphal elements in the specimen are sufficient to start the antifungal treatment, so this study enables patient's treatment at an earlier period.

Materials and Methods:

This study was carried out from April 2014 to September 2014 at Tirunelveli Government College, Tirunelveli, Tamil Nadu.A total number of 55 samples were collected from the patients attending Skin OPD, Medicine OPD, Diabetic OPD.Proper consent was be obtained from the patients before collecting the samples and proper ethical committee clearance was also be obtained.

Sample Collection:

For Dermatophytosis the samples collected are epidermal skin scrapings. The scrapings were obtained from near the advancing edges of the lesion after disinfecting with 70%ethanol.In case of *Tinea nigra* scalpel was used to scrape the scales. In fungal hair infections basal root portion of the hair was collected by plucking the affected hair with sterile forceps. For nail infections the samples were obtained from the more proximal part of the diseased nail and the full thickness nail clippings were obtained.

Microscopic Examination

Direct microscopic examination was undertaken in 10% potassium hydroxide (KOH) wet mount for the specimens of skin scales and hair pluckings, while 40% KOH was employed for nail specimens.

Isolation and Identification

Clinical Specimens, including skin, hair and nails that were suspected of containing Dermatophytes were inoculated onto Sabouraud Dextrose agar with antibiotics and Sabouraud dextrose agar overlaid in olive oil. All media were incubated at 30C. All cultures were held for 2 months before being discarded as negative. The colonies grown on Sabouraud dextrose agar were subjected to macroscopic and microscopic studies-Lacto phenol cotton blue examination. . Molds, yeasts, and bacteria may contaminate Dermatophyte cultures. In some instances a dermatophyte culture may contain two different dermatophytes. The original isolation plates were re-incubated while purification was being formed.

Results:

This work showed that out of 55 patients it was possible to obtain 45 (81.8%) fungal isolates. Table - 1 shows the distribution of the fungal isolates in which 21 (46.6%) were *Dermatophytes* while 16 (35.5%) were *Malassezia furfur* and 8 (17.7%) were *Candida albicans.*

From Table 2 it is observed that dermatophytes were the cause of 21clinical *Tinea* infections. Out of this 18 cases were *Tinea corpora,* 2 were *Tinea pedis* and 2 were *Tinea unguium* and 1 was *Tinea capitis*. It is also observed from Table 2 that 16 superficial skin infections were caused by *Malassezia furfur*. It is also observed that Candida spp. was isolated from 6 skin specimens, 2 from hair specimens since these sites are mostly moist areas.

Out of the fungal dermatophyte isolates in this study, *Trichophyton spp.* comprises 12 (57.2%), *Microsporum spp.* were 5 (23.8%) and *Epidermophyton spp.* were 4 (19%).It is also ob-

served that 88.8% fungal isolates were from skin specimens while 6.67% were from hair specimens.(Table-3) Trichophyton spp. is the most common dermatophyte in male in the study population.(Table4)

Discussion:

This study found that out of the total 55(100%), 45(81.8%) were Superficial mycoses, this is due to deficient sanitation and health education among the study population. Dermatophytes were found to be 21(46.6%) of the total fungal isolates. This moderate incidence could be due to prior medical management outside. This incidence of superficial fungal infection (81.8%) seems to be higher than that reported by Mohamed S. Ellabib et.al. from El-Fateh University Tripoli LIBYA [4.] This may be due to the low number of sample size.

This study observed that 88.8% of superficial fungal infections are those involving the skin and this result is in concordance with other workers (Hirshmann et. al.)[5.] This reflects the skin's protective mechanisms failed because of trauma, irritation or maceration or there is occlusion of the skin with nonporous materials which can interfere with the skin's barrier function by increasing local temperature and hydration.[7]

Dermatophytes found from skin specimens (Tinea corporis) represented 35.5% which is almost similar to other reports.[8] Incidence of Tinea capitis and Tinea pedis is the lowest in this study because of the lower sample size when compared with other workers[9] Trichophyton spp represented the highest incidence (57.2%) among dermatophytes an observation which is in full agreement with others[10].

The result that *Malassezia furfur* represented (35.5%) of our isolates disagree with others[10] in that less frequently, superficial skin infections are caused by Malassezia furfur and Candida spp. This study also found that Candida spp. showed the lowest incidence among the nondematophytic superficial mycoses, this may be due to the study population selected which comprised mostly of young adults.

Conclusion:

In conclusion, *Trichophyton spp* was the common dermatophyte in the study population and the predominant clinical presentation of superficial mycoses is *Tinea corporis.*

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Table 1. Distribution of fungi causing superficial infections

Fungi	No.	%
Dermatophytes	21	46.6
Malassezia furfur	16	35.5
Candida spp.	8	17.7
Total	45	100

Fungi	Skin	Hair	Nail	%	Total
Dermatophytes	18	1	2	46.6	21
Malassezia furfur	16	–	–	35.5	16
Candida spp.	6	2	–	17.7	8

Table 2. Distribution of fungi infection according to body sites.

Table 3. Differentiation of Dermatophytes up to species level

Dermatophytes	No. of isolates	%
Trichophyton sp.	12	57.2
Microsporum sp.	5	23.8
Epidermophyton sp.	4	19
TOTAL	21	100

Table-4. Sex Distribution

Dermatophytes	Male	Female
Trichophyton sp	11	1
Microsporum sp.	3	2
Epidermophyton sp.	2	2

REFERENCE

1. Petmy LJ, Lando AJ, Kaptue L, Tchinda V, Folefack M. Superficial mycoses and HIV infection in Yaounde. J Eur Acad Deramtol Venereol 2004; 8:301-4. | 2. Gupta AK. Antifungal Agents: An overview Part II. JAm Acad Dermatol 1994;30: 911-933. | | 3 Emmons CW, Binford CH, Utz, Kwon-Chung KJ. Chapter 10, Dermatophytosis. In: Medical Mycology, (Lea and Febriger, Philadelphia) 1977. p. 117-67. | | 4. Martin A G, Koboyashi G S. Superficial fungal infection: dermatophytosis, tinea nigra. Piedra | Fitzpatrick's Dermatology in general medicine. 1999 vol 2. 5th ed. New York 2337-57. | | 5. Hirshmann JV. 2001. Fungal, bacterial, and viral infections of the skin. In: scientific American medicine, CD-ROM. Newyork: Scientific American, Inc. | | 6. Piérard GE, Xhauflaire-Uhoda E, Piérard-Franchimont C. The key role of corneocytes in pityrosporses.Dermatology 2006; 212:23-6. | | 7. Padhye, A.A. and Weitzman, I. Dermatophytes: in Topley and Wilson's microbiology. Microbial infection 9th ed. Vol 4. 1998.