

Clinico-mycological profile of isolates of superficial fungal infection: A study in a Tertiary care centre in Baster Region

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Abstract

The superficial (cutaneous) fungal infections involve skin and its appendages, hair and nails. The causative fungi colonize only cornified layer of epidermis or supra-follicular portion of hair and usually do not penetrate into deeper tissues. The distribution and frequency of these infections and their etiological agents vary according to the geographic region, the socioeconomic level of population, climatic variation, presence of domestic animals and age. These infections are usually presented as scaly patches with central clearing with sharply demarcated as annular, erythematous, sometimes with vesicles, blisters and pustules. These superficial fungal infections are also responsible for morbidity, affecting quality of life, have recurrent relapses and drug resistance. This study was carried to find out the prevalence of various fungi associated with superficial fungal infection. This is a retrospective observational study carried to see clinical and laboratory profile of clinically suspected cases of superficial (cutaneous) fungal infection cases attending Dermatology Out Patient Department (OPD) and Skin scrapings, hair and nail samples were collected and processed according to standard mycological protocol. A total of 120 specimens were collected from clinically diagnosed superficial fungal infection cases. Tinea corporis was the most common clinical type in our study followed by *Pityriasis versicolor*, Onycomycosis and *Tinea pedis*. Most common dermatophyte species isolated was *Trichophyton mentegrophyte* and *Malassezia* sp. followed by *Trichophyton violaceum*, *Candida* sp., *Trichophyton rubrum*, *Microsporum audouinii* and *Fusarium* sp. Along with dermatophytes, nondermatophytic fungal infections are emerging as important debilitating problems affecting quality of life. Due to different type of antifungal use in different superficial mycoses, laboratory confirmation is desired, to decrease inappropriate use of drugs and drug resistance.

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Introduction

Superficial cutaneous fungal infections are common in dermatology clinics. Two types of superficial cutaneous fungal infections are seen dermatophytosis (predominantly) and dermatomycosis. Dermatophytosis is the commonest type of cutaneous fungal infections seen in man and animals. *Tinea* and ringworm infections are other commonly used synonyms for dermatophytosis. Non dermatophytic fungi infecting skin are called as dermatomycosis. These dermatomycoses includes *Malassezia* infections, *Tinea nigra*, and other non-dermatophytic mycelial fungus. *Malassezia* a lipophilic fungus is responsible for various clinical conditions like *Pityriasis versicolor*, seborrheic dermatitis and atopic dermatitis. Onychomycosis traditionally including non dermatophytic infection of nail but now denotes all fungal infections of nail. These are caused mainly by *Candida* sp., *Fusarium* sp., *Aspergillus* sp., *Acrimonium* sp. and various other fungi (Grover and Roy, 2003). Dermatophyte infections are one of the earliest known fungal infections of mankind and are very common throughout the world (Venkatesan *et al.*, 2007). These fungi have the capability to produce keratinase, which allows them to metabolize and live on human keratin like skin, nail and hair (Das, Basak, and Ray, 2009). Dermatophytic infections cause morbidity and poses a major public health problem. Over the last few decades, an increasing number of non-dermatophyte filamentous fungi have been recognized as agents of skin and nail infections in humans, producing lesions clinically similar to those caused by dermatophytes (Aggarwal, Arora and Khanna, 2002).

The prevalence of dermatophytosis varies from place to place (Ajello, 1962; Havlickova, Czaika, and Friedrich, 2008). Clinically different types of dermatophytosis are classified according to body site involvement (Ahearn, 1988; Aly, 1975; Bettley, 1965). Dermatophytic infections continue to be one of the principal dermatological diseases despite the availability of effective antifungal agents especially in tropical countries.

Extensive resistant type of dermatophytosis are seen in person immunocompromised due to iatrogenic reasons as in cases of organ transplantation and immunotherapy of various medical conditions and HIV infection (Torssander *et al.* 1988).The present study was undertaken with a view to analyse the prevalence of dermatophytosis and non-dermatophyticfungal pathogens among patients attending dermatology OPD.

Material and method

Study design

This retrospective observational study was conducted at a tertiary care centre in tribal area of Baster region in Chhattisgarh.

Sampling/data collection

Hospital and laboratory record of total of 120 patients presenting with disease of skin, hair and nail in the dermatology OPD (From 1 January 2014 to 31 December 2014) was collected and analyzed. Data regarding a number of various sociodemographic factors (age, sex, occupation) and other related variables (history of previous infection, site of infection, nature of work) were collected.

Data analysis

Microsoft Excel 2007 was used to do analysis

Sample collection method followed in Laboratory

Samples were taken from study population as skin scraping, hair stubs, nail clipping. Sample were collected with aseptic precautions after cleaning with alcohol wipe and samples were studied with following tests.

KOH mount

All the samples were studied under low power and high power field by mounting in microscope after treating it with KOH for dissolving the keratin material.

Culture

All the samples were inoculated on Sabourauds dextrose agar (SDA), SDA with antibiotic and actidione.

For identification of fungal isolates Lactophenol cotton blue (LCB) mount was used.

Result

Analysis of record found 120 patients whom clinical and laboratory examination for superficial fungal infection was done. Among total cases 70% were male and 30% were female. Commonest age group involved was 21-40 years followed by <20 years, 41-60 years, >61 years.

(Table 5) In our study most common clinical type of fungal infection was Tinea corporis (33.33%) followed by *Pityriasis versicolor* (20%) (Table 1). Positivity of direct microscopy (KOH mount) was 70% while culture positivity was 28.33% (Table 2). Most common dermatophytic sp. isolated was *Trichophyton mentegrophyte* (23.59%) and *Malassezia* sp. (23.59%) followed by *Trichophyton violaceum*, *Candida* sp., *Trichophyton rubrum*, *Microsporum audouinii* and *Fusarium* sp. (Table 3).

Table 1. Distribution of superficial fungal infection by clinical type.

Clinical diseases	No. of cases	Percentage
Tinea corporis	40	33.33%
Tinea cruris	08	06.67%
Tinea pedis	16	13.33%
Tinea mannum	01	0.08%
Tinea capitis	04	03.33%
Tinea unguium	01	0.08%
Tinea faciei	06	5.00%
Pityriasisversicolor	24	20.00%
Onycomycosis	20	16.67%

Table 2. Correlation of result between KOH and culture examination.

	KOH positive	KOH negative	Total
Culture positive	34	00	34
Culture negative	50	36	86
Total	84	36	120

Table 3. Frequency of different Dermatophyte species.

Sp.	No. of cases	Percentage
<i>Trichophyton mentegrophyte</i>	8	23.59
<i>Trichophyton violaceum</i>	4	11.76
<i>Trichophyton rubrum</i>	3	8.82
<i>Microsporum audouinii</i>	3	8.82
<i>Epidermophyton floccosum</i>	1	2.94
<i>Fusarium</i>	3	8.82
<i>Candida</i> sp.	4	11.76
<i>Pityriasis versicolor</i>	8	23.59

Table 4. Site wise distribution of fungal infections.

Site	Hair	Nail	Skin	Total
	10	20	90	120

Table 5. Age wise distribution of fungal infections.

Age group	<20 years	21-40 years	41-60 years	>61 years	Total cases
	21	36	18	9	84

Table 6. Gender wise distribution of fungal infections.

Gender	Male(%)	Female(%)	Total
	59(70%)	25(30%)	84

Discussion

Identification of fungal agents and their species are important not only for epidemiology but also for therapeutic point of view when treatment is advised for long time. Baster region is a tribal area with dense forest and the climate is humid with heavy rain fall. Most of the population is tribal and they use to work in jungle with few clothes and bare feet. Fungal infections are very common in this region. They produce diverse human infections ranging from superficial skin infections to systematic disease. Total 120 cases were studied for superficial mycoses. Among all positive patients 59 (70%) were male and 25 (30%) were female patients. Male to female ratio in our study was 2.3: 1; higher incidence in males could be due to more physical and outdoor activity. Our study result are in accordance with other studies published worldwide (Article 2010; Patel, Patel, and Nerurkar n.d.; Vishal Jariwala, RK Bansal, Swati Patel 2010). Persons of all ages are susceptible but most of the cases of fungal infection occurred in 21-40 years of age group (46.67%) followed by <20 years (Article, 2010; Khadka *et al.*, 2016; Mishra *et al.*, 1998; Vishal Jariwala, RK Bansal, Swati Patel, 2010).

According to anatomical site involvement most common clinical disease type was *Tinea corporis* (33.33%) followed by *Pityriasis versicolor* (20%) many other researchers are having more or less same result (Table 1) (Mathur, Kedia, and Ghimire n.d.; Vishal Jariwala, RK Bansal, Swati Patel, 2010). In our study the prevalence of *Pityriasis versicolor* is high as the causative agent flourishes well in warm, hot and humid climate with special privilege to excessive sweating and immune-compromised conditions (Dr. Pradeep Nawal, 2012; Khadka *et al.*, 2016; Mishra *et al.*, 1998; Negi *et al.*, 2017). Most of patients were farmer, spend most of the day in field and having habit of pond bathing; hence higher incidence of *P. versicolor* could be understood.

Direct microscopy (KOH mount) was positive in 70% cases while culture positivity was 28.33%.

(Table 2) Most common fungal sp. isolated is *Trichophyton mentegrophyte* (23.59%) and *Malassezia* sp. (23.59%) followed by *Trichophyton violaceum*, *Candida* sp., *Trichophyton rubrum*, *Microsporum audouinii* and *Fusarium* sp. (Table 3).

Conclusion

Now a day's people are more aware about skin diseases and presentation of most of cutaneous disorders simulate; so proper evaluation/diagnosis of diseases whether it is fungal diseases or pure dermatological diseases is necessary before starting of antifungal treatment. Cutaneous fungal infection needs personal hygiene, awareness of infection, early and proper diagnosis and medication. In the present study along with dermatophytes, nondermatophytic fungi are also emerging as important causes of superficial mycosis. Direct microscopy and culture are important tool of diagnosis for identification and better management of fungal infections.

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Conflicts of Interest: None

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