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A short study on superficial mycoses with evaluation of topical antifungal agents in a tertiary care hospital

S. BASAK[1], D. GHOSH[1], M. MUKHERJEE[1], M. MAJUMDAR[1], S. GANGULY[1], S. SARKAR[2], J.DAS[2] AND D.N. GANGULY[2]

[1]Department of Microbiology, Mycology Division, School of Tropical Medicine, Kolkata
[2]Department of Dermatology, School of Tropical Medicine, Kolkata

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Dermatophytic fungal infections are one of the most common infectious fungal diseases in the world and are among the most commonly diagnosed skin diseases. The hot and humid environment of tropical countries like India is probably the major reason for their high prevalence. Superficial fungal infections are the important mycoses found in India. Many drugs are available at present to treat fungal infections that can be divided into four broad groups on the basis of their mechanism of actions. But their efficacy varies from case to case including refractoriness to treatment by some antifungal agents. Hence, in the present study various types of superficial mycoses were considered along with an effort to evaluate the efficacy of two antifungal drugs like Clotrimazole and Fluconazole on superficial mycoses. The study was carried out over a period of three months in a tertiary care hospital in Kolkata. Fifty eight clinically suspected patients were selected for the study who attended Out Patients' department (OPD) of Department of Dermatology, School of Tropical Medicine, Kolkata. Samples were collected after examination and obtaining proper history and relevant information from these patients using a standard proforma. Collected samples were examined by KOH preparation followed by culture on SDA (Sabouraudis Dextrose Agar) and SDCCA (Sabouraudis Dextrose Chloramph emicol Cycloheximide Agar) media. Isolates if any were identified using standard techniques as per test results, patients were prescribed to use formulations of Clotrimazole or Fluconazole and were advised to come after 2,4 and 8 weeks. Results of such treatment were noted and the efficacies of the antifungal drugs were compared. Out of 58 clinically suspected patients, 41 were positive by microscopy and 17 were negative. Maximum number of patients was found in the age group of 21-40 years and male patients dominated over females. Tinea corporis is the most common variant of superficial fungal infection affecting 72.41% followed by Tinea pedis in 12.06% and Tinea manuum in 10.34% cases. There is no difference in the action of topical Clotrimazole and Fluconazole, as the difference in the change in the skin scraping status between the two groups was not significant (p=0.74 at first follow up and p=0.86 at second follow up).

Key words: Dermatophytes, superficial mycoses, topical antifungal agents, Clotrimazole, Fluconazole

INTRODUCTION

Superficial fungal infection or superficial mycoses affect skin, hair and nail. On the skin and scalp, they often coalesce to form confluent areas of dry, scaling skin with itching lesions which in severe case may ulcerate. Superficial fungal infections include Dermatophytosis, Cutaneous Candidiasis, Pityriasis versicolor, Tinea nigra and Piedra. Many studies have been done on the prevalence of etiological agents of superficial mycoses in different parts of the world (Ellabib and Khalifa, 2001; Stats and Khalifa, 1995; Venugopal and Venugopal, 1993). In this type of infection, host susceptibility may be enhanced by moisture, warmth, specific skin chemistry, composition of sebum, perspiration, age, heavy exposure and genetic predisposition (Brooks *et al.*, 2004). The incidence is higher in hot humid climate and crowded living condition (Das *et al.*, 2009). Although not life threatening, superfi-

[1]Email: sbasakcal@yahoo.com

cial mycoses can be persistent and symptomatic. Dermatophytoses refers to infections of keratinized tissues of human body (skin, hair and nails) by a group of related filamentous fungi e.g. *Trichophyton, Microsporum* and *Epidermophyton* collectively called Dermatophytes. These infections often present with characteristic lesions, but may be difficult to diagnose sometimes and are mistaken with other cutaneous disorders. In these cases laboratory investigation is essential for correct diagnosis and management. Dermatophyte or tinea infections are named according to their sites of localization.

Various protocols with use of topical and systemic antifungals or a combination of both have been tried for the treatment of such infections. The more used antifungal agents are Griseofulvin (the "gold standard" in tinea capitis), the azoles (Itraconazole and Fluconazole) and allylamines like Terbinafine. Topical therapy is used as the sole therapy in the limited form of infection and whenever the hair or nails are not involved. They are important as adjuvant of systemic therapy. Ciclopirox, an Amorolphin nail lacquer formulation is useful in treatment of onychomycosis. Also several different measures are important in the prevention of reinfection (Raquel, 2009). An attempt has been made to study and characterize various forms of superficial mycoses with an effort to compare the efficacy of two antifungal Clotrimazole and Fluconazole on these cases with short follow up study.

MATERIALS AND METHODS

The present study was carried out over three months from March, 2011 to May, 2011 in a tertiary hospital like School of Tropical Medicine (STM), Kolkata. Fifty eight clinically suspected subjects attending the Out Patients Department (OPD) of Dermatology were included in the study. The records of the cases were properly registered in a case proforma sheet. Persons with skin lesions other than superficial mycoses were excluded from the study. Patients were distributed according to their age group, sex, income group, site of infection and the response to antifungals.

Sample was collected from the site of lesion and was subjected to direct microscopic examination of wet KOH (10%) mount. This was followed by culture on SDA and SDCCA media and incubated at 25°C in the BOD incubator for at least 2-3 weeks. All the procedures were done as per standard protocol (Chander, 2002).

RESULTS

In our study of 58 diagnosed patients maximum number belonged to the age group of 21-40 years where males dominated over females. This is clearly depicted in the following Table 1. This study also showed that majority of the patients (34/58) were found in the income group of Rs.1001-Rs.5000 and as a whole, males predominated in all income groups except in the lower income strata (<1000/m).

In the analysis of the occurrence of the types of lesions according to their sites of localizations, it is evident from the above table that out of the total 58 patients, 42 were suffering from Tinea corporis, 3 patients showed Tinea facies, 6 patients Tinea manuum and 7 patients suffered from Tinea pedis. Again, in all types of lesions, males suffered more than the female counterparts.

In our study, to assess the efficacy of topical antifungal, 58 clinically diagnosed patients were divided into two main groups. One group of 36 patients was treated with topical Clotrimazole while in another group of the remaining 22 patients treatment was done with topical Fluconazole. Various manifestations and the effects of the antifungal on these patients were observed before treatment and after 14 days and 28 days of treatment. The results thus obtained have been depicted in the Table 2.

In our study, the patients (58) were divided into two groups. The first group consisted of 36 patients who were treated with topical Clotrimazole. The second group consisted of 22 patients who were treated with topical Fluconazole. Patients from the both the groups showed at least one of the symptoms as given in the Table 2. After commencement of the treatment with antifungal agents, follow up study was carried out as per protocol to detect the efficacy to treatment in each case.

In the Clotrimazole group, at the first follow up visit after 14 days, the scraping was negative in 21 out of 32 patients that came for follow up. Four patients were lost in the first follow up. In the second follow up study, 28 out of 29 patients showed negative result on scraping after 28 days, where seven patients failed to report.

In the Fluconazole group, at the first follow up visit after 14 days, the scraping was negative in 14 out of 20 patients where two patients were lost and at the second follow up after 28 days, 16 out of 18

patients showed negative result by KOH preparation (here also a total of four patients in this group did not turn up for follow up study).

Table-1: Distribution of patients according to various parameters (n=58)

Age group(Yrs)	Male (%)	Female (%)	Total (%)
0 – 20	9 (15.51)	6 (10.34)	15 (25.86)
21 – 40	19 (32.75)	14 (24.13)	33 (56.89)
41 – 60	4 (6.89)	5 (8.62)	9 (15.51)
> 60	1 (1.71)	0	1 (1.71)
Income group (Rs/month)			
Up to 1000	1 (1.71)	3 (5.17)	4 (6.89)
1001-5000	19 (32.75)	15 (25.86)	34 (58.62)
5001-10000	10 (17.24)	6 (10.34)	16 (27.58)
10001-15000	3 (5.17)	1 (1.71)	4 (6.89)
Sites of lesions			
T.corporis	22 (37.93)	20 (34.48)	42 (72.41)
T.facies	2 (3.44)	1 (1.72)	3 (5.17)
T.manuum	5 (8.62)	1 (1.72)	6 (10.34)
T.pedis	4 (6.89)	3 (5.17)	7 (12.06)

This betterment in skin scraping status by KOH preparation following treatment with topical antifungal agents is highly significant ($p< 0.001$) whereas the difference in the change in the skin scraping status between the two groups was not significant ($p=0.74$ at the first follow up and $p=0.86$ at the second follow up).

DISCUSSION

During the study period, out of the total patients that attended Dermatology OPD of School of Tropical Medicine, 58 clinically suspected patients were selected for the present study.

Out of these 58 patients, 41 (70.7%) was found to be positive by microscopy and 17 (29.3%) were negative. A similar result was found in a study conducted at Rajkot, India, where 200 clinically suspected cases of dermatophyte infections were subjected to direct smear examination when 68% were positive for fungus (Sharma *et al*, 2000).

Out of the total 58 clinically suspected patients, male patients were found to be more than females. Among the males the maximum numbers of patients were found to be in the age group of 21-40 years (19 of 58) and minimum number of patients were in the age group of above 60 years (1 of 58). Similarly among the females, the maximum numbers of patients were found to be in the age group of 21-40 years (14 of 58) and no patient was in the age group of above 60 years. Identical findings were shown in studies conducted in Kolkata, India (Das *et al*, 2009). In the study conducted in India, most of the Tinea infected group was in the age group

Table 2: Response to anti fungals in study patients (n=58)

Types of response	Day 0 (Pre treatment)		Day 14			Day 28		
	Clotrima No. /Total	Flucona No. /Total	Clotrima No. /Total	Flucona No. /Total	*p* value	Clotrima No. /Total	Flucona No. /Total	*p* value
Erythema	36/36	22/22	7/32	7/20	0.3	3/29	2/18	0.69
Exudation	20/36	12/22	1/32	2/20	0.67	1/29	2/18	0.67
Pustulation	12/36	5/22	1/32	1/20	0.69	1/29	0/18	0.85
Crusting	9/36	5/22	1/32	0/20	0.81	0/29	0/18	-
Scaling	35/36	22/22	7/32	9/20	0.88	2/29	3/18	0.57
Itching	30/36	22/22	7/32	5/20	0.79	1/29	2/18	0.67
Burning	10/36	7/22	4/32	0/20	0.26	1/29	0/18	-
Pain	3/36	2/22	0/32	0/20	-	0/29	0/18	-
KOH +ve	25/36	16/22	11/32	6/20	-	1/29	2/18	-
KOH -ve	11/36	6/22	21/22	14/20	-	28/29	16/18	-

of 21-40 years.

From the present study it appears that Tinea corporis is the most common variant of superficial fungal infection affecting 72.41% of the fungal infections followed by Tinea pedis in 12.06% and then Tinea manuum in 10.34%. a number of hospital based studies in India have confirmed that majority of individuals are affected by Tinea corporis (Das *et al.,* 2009; Kamalam and Thambiah, 1976). The present study also reveals that the patients who were mainly affected with the Tinea infections belonged to the income group of Rs.1, 001-5,000 per month. Minimum number of Tinea infection occurred in the income group above Rs.10, 000 per month. This study correlates with the study conducted in Kolkata, India (Das *et al.*, 2009).

In this study we have noticed that there was very little difference in the action of the two drugs Clotrimazole and Fluconazole and the difference was not significant. This data also correlates with a relevant study (Crawford and Hollis, 2007). As the present study was conducted in a tertiary care hospital, the data may not be the true reflection of the findings if studied in the community. So, for better correlation a community based study could be planned involving a large population.

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