



Drug Prescribing Pattern in Dermatophytosis at the Medical Outpatient Clinic of a Tertiary Healthcare in Karnataka, India

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Abstract

Aim of this study is to ascertain the drug prescribing pattern of the patients with Tinea infections attending a tertiary care teaching centre. This retrospective study conducted at a tertiary care teaching hospital in the Dakshina Kannada district, Karnataka for a period of one year. 158 prescriptions were audited to find generic/ brand names of drugs, number of drugs, dosage, forms, frequency, and duration of treatment. The age and sex distributions of patients and disease distribution were also studied. 72 (45.57%) patients were males and 86 (54.43%) were females. Terbinafine, Ketoconazole, Sertaconazole were prescribed as topical monotherapy. Clobetasone butyrate, Sertaconazole and Miconazole were prescribed as topical polytherapy. Terbinafine, Fluconazole and anti histaminics were prescribed as systemic monotherapy and polytherapy. Statistical analysis revealed p-value was > 0.05. Prescription patterns were in consensus with the general guidelines.

Keywords: Dermatophytoses, medical audit, tertiary healthcare

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Introduction

Dermatophytosis (tinea infection) is superficial fungal infection of skin, hair and nail caused by dermatophytes. Dermatophytes are divided into three genera *Trichophyton*, *Microsporum* and *Epidermophyton*. Distribution of these dermatophytes varies with the geographical area.

Transmission generally occurs through direct contact with infected persons, animals, soil or fomites. Depending on their habitat, dermatophytes are described as anthropophilic (human), zoophilic (animal) or geophilic (soil). Anthropophilic dermatophytes are the most common sources of tinea infections, but zoophilic sources should be identified (if possible) and treated to prevent human reinfection. Anthropophilic dermatophytes isolated in south Karnataka are *Trichophyton rubrum*, *Trichophyton mentagrophytes*, *Trichophyton tonsurans* and *Epidermophyton floccosum*. Geophilic dermatophyte predominant in this region is *Microsporum gypseum* [1].

Tinea infections are classified according to their anatomic location viz. *Tinea capitis* (scalp), *Tinea barbae* (beard area), *Tinea corporis* (skin other than bearded area, scalp, groin, hands or feet), *Tinea cruris* (groin, perineum and perineal areas), *Tinea pedis* (feet), *Tinea manuum* (hands) and *Tinea unguium* (nails). *Tinea corporis* has been reported to be the most common clinical type of dermatophytosis in south India by Hanumathappa et al. They also noted *Tinea corporis* and *Tinea capitis* to be common, while *Tinea pedis*, *Tinea manuum*, *Tinea barbae* and *Tinea faciale* uncommon dermatophytosis in this geographic region.

The classic presentation of tinea infection, known as “ringworm,” is a lesion with central clearing surrounded by an advancing, red, scaly, elevated border. One or more lesions may appear. Inflammation assists in colonization and may result in vesicles on the border of the affected area. Atopic persons and those infected with zoophilic fungi tend to have more inflammation.

Tinea infection is treated with antifungal drugs. A number of topical as well as systemic antifungal drugs are currently available in the market. Newer antifungal drugs are also in pipeline of development. The guideline of treatment of tinea infection is also subject to continuous revision. Updated guideline regimen should be prescribed for treatment of tinea infection.

The present study was undertaken to ascertain the drug prescribing pattern of the patients with dermatophytosis at a tertiary care teaching centre in south India.

Material and Methods

The present retrospective was conducted at KVG Medical College and Hospital, Sullia, Karnataka during the period December 2011 to November 2012.

This study was approved by Institutional ethical committee, KVG Medical College, Sullia.

Total 158 prescriptions of patients suffering from tinea infections were collected from the Dermatology outpatient department. Disease data, data pertaining to drugs (drugs prescribed, dose, strength, route and adverse effects) were noted.

These data were analyzed to evaluate the prescription pattern and rationality of the use of drugs in the treatment of tinea infections. These data collected were also subjected to statistical analyses and the relevant statistical methods employed were unpaired t-test and Chi-square test.

Results

Topical monotherapy was prescribed in total 83 (52.83 %) patients and out of them 36 (22.79 %) were prescribed Terbinafine hydrochloride (1%) while remaining 32 (20.25 %) received Sertaconazole (2.5 %) and 15 (9.49 %) had Ketoconazole (2 %). Topical polytherapy were prescribed in total 75 (47.47 %) patients and out of them 67 (42.41 %) were prescribed a combination of Sertaconazole (2%) and Clobetasone butyrate (0.05 %) while remaining 8 (5.06 %) received Miconazole (2%) and Clobetasone butyrate (0.05 %).

On statistical analyses, unpaired t-test for monotherapy patients revealed Difference -3.000, Standard Error 4.6786. 95 % CI difference -15.9898 to 9.9898, Test Statistic $t=0.641$, Degree of Freedom (DF) 4 and Two-tailed probability $P=0.5563$. Unpaired t-test for polytherapy patients revealed Difference -2.500, Standard Error 21.1009, 25 % CI of difference -93.2901 to 88.290, Test Statistic $t=0.118$, Degree of Freedom (DF) 2 and Two-tailed probability $P=0.9165$. Chi-square analyses of patients being treated with polytherapy revealed chi-square 0.0107, DF 1, Significant level $P=0.00821$ (Table 1).

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Systemic drugs were prescribed as monotherapy in 78 (49.36%) patients and out of these 39 (24.68%) were advised Terbinafine and rest 39 (49.36%) received Fluconazole. Systemic polytherapy consisting of Terbinafine and levocetirizine were prescribed in 80 (50.64%) patients.

On statistical analyses, unpaired t-test revealed Difference -4.0000, Standard Error 3.5355, 95 % CI of difference -19.2122 to 11.2122, Test Statistic t -1.131, Degree of Freedom (DF) 2, Two tailed probability P=0.3735 and Chi-square test revealed, Chi-square 0.000200, DF 1, Significant level =0.9887 and Contingency Coefficient 0.00113 (Table 2).

Table1. Topical monotherapy and polytherapy treatment in tinea infections (n= 158)

DRUGS	MALE				FEMALE				TOTAL	
	Mono		Poly		Mono		Poly			
	No.	%	No.	%	No.	%	No.	%	No.	%
Terbinafinehcl (1%)	15	9.49	-	-	21	13.30	-	-	36	22.79
Ketoconazole (2%)	7	4.43	-	-	8	5.06	-	-	15	9.49
Sertaconazole (2%)	15	9.49			17	10.76	-	-	32	20.25
Clobetasone butyrate (0.05%) Sertaconazole (2%)	-	-	30	18.99	-	-	37	23.42	67	42.41
Clobetasone butyrate (0.05%) Miconazole (2%)	-	-	5	3.16	-	-	3	1.90	8	5.06
									158	100

MONO=Monotherapy, POLY=Polytherapy, No=Number of patients, %=Percentage of patient , n = total number of patients

Table 2. Systemic monotherapy and polytherapy treatment in tinea infections (n = 158)

DRUGS	MALE				FEMALE				TOTAL	
	Mono		Poly		Mono		Poly			
	No.	%	No.	%	No.	%	No.	%	No.	%
Fluconazole(150mg)	20	12.66			19	12.02			39	24.68
Terbinafine (250mg)	15	9.49			24	15.19			39	24.68
Terbinafine (250mg) Levocetirizine (5mg)			37	23.42			43	27.22	80	50.64
									158	100

MONO=Monotherapy, POLY=Polytherapy, No=Number of patients, %=Percentage of patients, mg=milligram, n=total number of patients.

Discussion

Topical antifungal agents used for treatment of dermatophytosis are Butenafine, Naftifine, Terbinafine, Amorolfine, Clotrimazole, Econazole, Ketoconazole, Miconazole, Oxiconazole,

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Sertaconazole, Sulconazole, Eberconazole, Luliconazole. Ciclopirox, Haloprogin, Tolnaftate and Undecylenate. They are effective in limited superficial infections (localized Tinea corporis and uncomplicated Tinea pedis) [2].

Systemic (oral) antifungal agents used for treatment of dermatophytosis are Griseofulvin, Itraconazole, Terbinafine and Fluconazole Use of an oral antifungal agent requires consideration of the type of infection, organism, spectrum, pharmacokinetics, profile, safety, compliance and cost. Systemic therapy is necessary for Tinea capitis or follicular based fungal infections [3].

Prescription pattern analysis in the present study reveals use of Terbinafine, Ketoconazole, Miconazole and Sertaconazole as topical antifungal drugs. Terbinafine and Fluconazole were used as systemic (oral) antifungal drugs.

Systemic review and mixed treatment comparison meta-analysis by Rotta et al revealed no statistically significant differences among 14 topical antifungal agents concerning the outcome of mycological cure at the end of treatment. Regarding the sustained cure outcome Butenafine hydrochloride and Terbinafine hydrochloride were significantly more efficacious than were Clotrimazole, Oxiconazole nitrate and Sertaconazole nitrate. Terbinafine also demonstrated statistical superiority when compared with Ciclopirox and Naftifine hydrochloride showed better response compared with Oxiconazole [4].

Delrosso and Kircik reported Allylamines (Terbinafine, Naftifine) superior to Azoles (Ketoconazole, Econazole) in activity against dermatophytes. They also documented rapid onset of clinical activity and favourable data on sustained clearance of infection with Naftifine [5].

Choudhary et al studied efficacy and safety of Terbinfine hydrochloride 1% cream vs Sertaconazolenitrate 2% cream and observed both the drugs to be equally effective in tinea corporis and tinea capitis [6].

Thakur et al conducted a comparative randomized open level study to evaluate efficacy, safety and cost-effectiveness between topical Sertaconazloe vs Batenafine and reported 1% Butenafine to be more efficacious, cost-effective and equally safe as compared to 2% Setaconazole in tinea infections of skin [7].

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Jearjani et al studied comparative effectiveness and safety of Sertaconazole 2% vs Terbinafine 1% vs Luliconazole 1 % in patients of dermatophytosis and observed Sertaconazole to be more effective in relieving signs and symptoms than Terbinafine and Luliconazole. They also noted all the three effective in achieving mycological cure [8].

Choudhary et al observed Eberconanazloe nitrate 1% cream as effective as Terbinafine 1% cream for the treatment of localized tineacorporis and tineacruris [9].

Topical Sertaconazole has shown better improvement in clinical parameters than topical Clotrimazole in treatment of tinea corporis in a comparative study conducted by Shivmurthy et al to compare topical Sertaconazole and Clotrimazole [10]. In the present study topical antifungal and corticosteroid combination has been noted to be prescribed in some patients.

Zuuren and Fedorowics reported that combination of Azoles with Corticosteroids were slightly more effective than azoles for clinical cure in tineacruris and tineacorporis but there was no statistically significant difference with regards to mycological cure [11]. Havlickova and Friedrich recommended combination therapy of topical antifungal with a topical corticosteroids for tinea infection associated with inflammation [12].

Recently, Goldstein and Goldstein suggested that addition of a corticosteroid to an antifungal should be considered 'mistreatment', as it might mask the sign of tinea infection and lead to tinea incogito. They even suggested that use of these combinations may be associated with persistence or recurrent infection [13].

Systemic antifungal agents noted to be prescribed in the present study were Terbinafine and Fluconazole. Fluconazole requires elevated concentrations to achieve a fungistatic effect, which is consistent with the mechanism of action of azole antifungals. Fluconazole is less active than Terbinafine [14].

There is scope for improvement in prescribing patterns in treatment of dermatophytosis. New antifungal drugs should also be tried. Use of combination therapy of topical antifungal with a topical corticosteroid should be restricted.

Conclusion

The present study concludes that majority of prescriptions were written rationally. Effective and safe topical antifungal agents were prescribed. Current standard treatment guidelines should be followed to enhance the effectiveness of treatment. Further research studies for safe and effective topical as well as systemic antifungals are needed.

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Author Disclosure Statement

No Conflict of Interest and no competing financial interests.

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