International Journal of Research in Medical Sciences
Badar VA et al. Int J Res Med Sci. 2023 Jun;11(6):2196-2201
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012

DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20231642

Original Research Article

Drug utilization study of patients with dermatophytosis attending dermatology outpatient department in tertiary care teaching hospital in Central India

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Received: 31 October 2022
Revised: 11 April 2023
Accepted: 28 April 2023

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ABSTRACT

Background: Dermatophytosis is a common fungal infection in India, with prevalence ranging from 36.6% to 78.4%. Treatment options include topical and systemic antifungal agents such as amphotericin B, clotrimazole, miconazole, luliconazole, itraconazole, and terbinafine. With the availability of newer antifungal drugs, a drug utilization study is necessary to understand prescription patterns and promote rational use.
Methods: This is a retrospective observational study conducted among the patients attending outpatient department of dermatology of Indira Gandhi Government Medical College and Mayo Hospital. Prescription of patients with diagnosis of tinea were collected using efficient digital database. These prescriptions were then analysed depending on their demographic profile, treatment and then results were evaluated with the help of MS Excel and results presented as percentage and proportion.
Results: Total 3701 patients had tinea with 1658 females and 2043 males with majority of patients from 16 to 30 years of age. 81% medicine were prescribed using brand names with prescription containing maximum antifungal drugs followed by antihistaminic drugs. Most common drug prescribed was terbinafine (29%), followed by luliconazole (27.46%) and itraconazole (17%). Most commonly topical antifungal agents were prescribed as cream (35.80%) followed by as lotion (26.26%).
Conclusions: Drug utilisation pattern study like this is very important for studying the varying prescription pattern in treatment of dermatophytosis and to make a first step towards uniform and rational drug prescription.

Keywords: Dermatophytosis, Drug utilisation study, Antifungal agents, Terbinafine

INTRODUCTION

Dermatophytosis also known as tinea is a type of fungal infection caused by dermatophytes belonging to class Microsporum, Trichophyton and Epidermophyton.[1] Majority of cases of dermatophytosis has superficial fungal infection but it can cause deepermore invasive lesion in many cases. Typically, dermatophytosis patient are presented to dermatological outpatient department with erythematous scaly plaque with annular appearance. This annular appearance is responsible for dermatophytosis also being called asringworm. Depending on the area involved dermatophytosis are given various names like infection of whole body is called tinea corporis, infection of nails is called tinea unguium, infection of foot called tinea pedis, infection of scalp called tinea capitis etc.[2] Diagnosis of dermatophytosis is mostly done by direct microscopic examination of skin scrapping with KOH.[3] According to recent studies, the prevalence of dermatophytosis is 36.6-78.4% in India.[4] Dermatophytosis is among the most

common aliment encountered in the dermatological outpatient department especially in developing country like India.[5] Almost 10-20% of people acquire dermatophytosis in their lifetime.[6] This increase in number can be attributed to humidclimate, urbanization and use of tight-fitting clothing.[7] Use of over-the-counter topical steroid preparation can also be one of the causes of increasing number of dermatophytosis patient and also for the rise of treatment resistant disease. Increase in emergence of tinea incognito can be attributed to overuse of over-the-counter topical steroids.[8]

The current treatment guideline given by expert census on management of dermatophytosis in India (ECTODERM) focuses on prescribing topical antifungal for mild cases and addition of systemic antifungal for severe dermatophytosis.[9] ECTODERM also mentions that combination therapy of systemic and topical antifungal should be given as empirical treatment in the management of dermatophytosis. It also advices on prohibition of use of steroid in most cases and should be used only the cases where antifungal agent was not able to help in complete recovery of the patient. Most commonly prescribed antifungals are Itraconazole 200 mg, Terbinafine 250 mg, Luliconazole, Griseofulvin 250 mg, etc.[10,11] Despite the increase in number of cases worldwide, there has been very little research done on dermatophytosis to study its changing clinical trend. Also, the guidelines used for the treatment of dermatophytosis are old and needs revision. With development of newer antifungals like sertraline and also newer variety of clinical presentation of dermatophytosis like tinea incognita study likes drug utilisation studies will help our practitioner to be in sync with the evolving trends and ultimately helping people with better patient care.[12] In viewof this our study focuses evaluating the prescription pattern of the patient diagnosed with dermatophytosis in dermatology outpatient department. We also aim at evaluating the demographic profile according to age, sex etc. of the disease and also to classify the drugs used in management of dermatophytosis according to their class like antifungals, antihistamines, etc.

METHODS

Study design, population and duration

This was a retrospective observational study. Prescription of patients attending dermatology outpatient department of the Indira Gandhi government medical college and Mayo hospital, Nagpur who were diagnosed with dermato-phytosis (tinea) and fulfilling following inclusion and exclusion criteria. The study was conducted for a period of 8 months from November 2020 to June 2021.

Inclusion and exclusion criteria

Patients with diagnosis of tinea and patients without comorbidities were included. Pregnant and lactating women and in patient department patients were excluded.

Data collection

This is a duration-based study on hence all the prescriptions during study duration were collected. The prescription of all the patients attending the dermatology outpatient department diagnosed with dermatophytosis (tinea) were collected using an efficient digital database.

Data analysis

All the data was analysed using MS Excel. This data was then analysed according to age, sex and site of infection. Also, the drugs were classified in various groups like antifungals, antihistaminic, etc and also according to their route of administration.Also, the prescription was analysed using WHO core Indicator to assess their rationality. The result of an analysed data was then presented as percentages and proportion.

RESULTS

Demographic distribution of dermatophytosis was studied in this study which included analysis according to gender and age of the patient. In our study total of 3701 patients were observed from which 1658 were females and 2043 were males. The male to female ratio was 1.23:1 as depicted in (Figure 1).

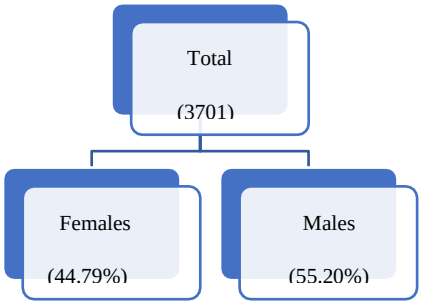

Figure 1: Gender wise distribution.

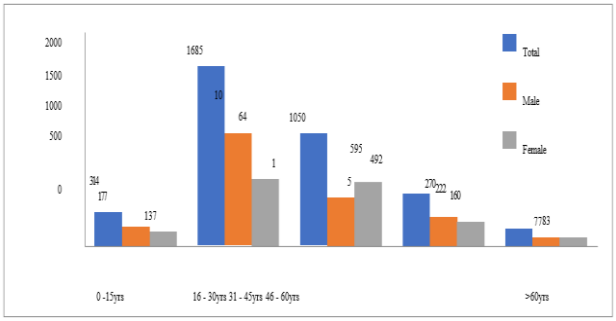

Figure 2: Age-wise distribution.

The prescription of the patients was divided into 5 groups to assess the age wise distribution of dermatophytosis. the five groups were 0-15 years, 16-30 years, 31-45 years, 46-60 years and above 60 years as shown in figure 2. Maximum number of patients were from 16-30 years of

age corresponding to 44.79% of total patients of 1064 were males and 621 were females, followed by 31-45 years of age corresponding to 28.37% of patients with 455 males and 595 females.

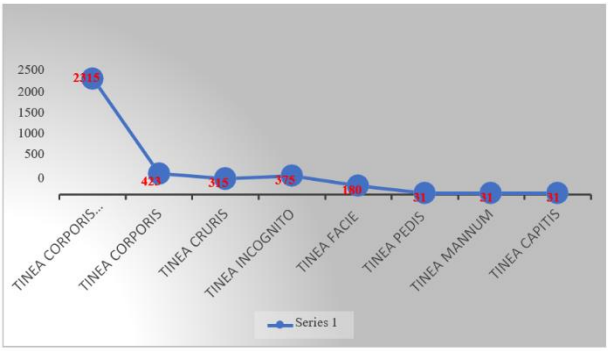

Figure 3: Clinical distribution of dermatophytosis.

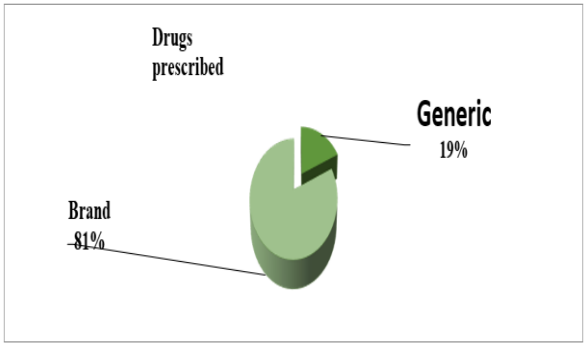

Figure 4: distribution according to brand and generic name.

Table 1: Class wise distribution.

Class of drug	N	%
Antifungals	6356	71.4
Antihistamine	2135	24
Corticosteroid &combination	55	0.61
Antibiotic	173	1.94
Analgesic	2	0.02
Retinoid & combination	18	0.20
Antiparasitic	30	0.33
Demyelinating agent	18	0.20
Keratolytic	12	0.13
Moisturizer/Emollient	57	0.64
Multivitamin	17	0.19
Sunscreen	12	0.13
Vasodilator	4	0.04
Face wash	1	0.01
Hair oil	1	0.01
Antiseptic	1	0.01

In our study, dermatophytosis were classified into various types depending on the location of infection into tinea corporis, tinea capitis, tinea unngium, tinea pedis, tinea facie, tinea incognito etc. among them the presentation of tinea corporis and tinea cruris was the most common accounting for 62.5 % of all the presentation followed by tinea corporis which was seen in 11.42% of the cases as shown in (Figure 3).

Table 2: Antifungal drugs.

Antifungals	N	%
Terbinafine	1900	29.88
Luliconazole	1746	27.46
Itraconazole	1081	17
Sertaconazole	963	15.14
Ketoconazole	213	3.35
Eberconazole	196	3.08
Miconazole	115	1.80
Fluconazole	79	1.24
Clotrimazole	38	0.59
Griseofulvin	15	0.23
Amorolfine	09	0.14
Terbinafine	1900	29.88
Luliconazole	1746	27.46
Itraconazole	1081	17
Sertaconazole	963	15.14
Ketoconazole	213	3.35

Table 3: Doses and duration of treatment of the drugs.

Drug	Dose (mg)	Frequency	Duration (days)
Terbinafine	250	OD	15-21
Itraconazole	200	OD	15-21
Griseofulvin	250	OD	15-21
Fluconazole	150	OD	15-21
Cetirizine	10	HS	15-21
Hydroxyzine	25	HS	15-21
Azithromycin	500	OD	3
Isotretinoin	10 /20	OD	15-21
Ivermectin	12	STAT	1

Prescription was studied and drugs prescribed were analysed if they were prescribed according to their brand name or generic name. it was found that from total 8894 drugs prescribed 7216 were prescribed using brand name and only 1678 were prescribed usinggeneric name as given in (Figure 4).

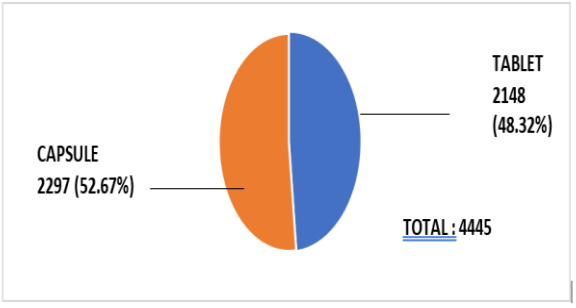

Figure 5: Systemic antifungal formulation.

Various classes of drugs were prescribed like antifungals, antibiotic, antihistamine, corticosteroids, analgesic, vasodilators etc. Most common among them was antifungal drugsaccounting for 6356 drugs from total 8894 drugs which equals to 71.4% of total drugs prescribed. It was followed by antihistamine drugs which was second most common drug tobe prescribed accounting for 2135 drugs or 24% of total drugs prescribed. Corticosteroids were prescribed only in 0.61% of cases which was in accordance to the guidelines of ECTODERM prohibiting the use of corticosteroids in majority of patients as shown in (Table 1).

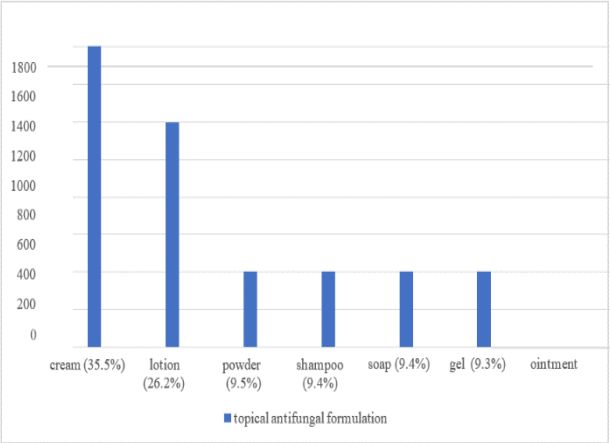

Figure 6: Topical antifungal formulation.

Table 4: Various antihistaminic drugs.

Antihistamine	N	%
Cetirizine	1651	77.35
Levocetirizine	23	1.07
Loratadine	07	0.32
Desloratadine	05	0.23
Hydroxyzine	447	21
Fexofenadine	02	0.09

Table 5: WHO core indicator.

Prescribing indicator	Total
Total number of drugs	8894
Average no of drugs per prescription	2.7
Percent medicines prescribed by generic name	19
Percent medicines prescribed as oral formulation	49.97
Percent medicine prescribed as topical formulation	51.14
Percent medicines prescribed from essential medicineslist	44

Among the antifungals most common antifungal prescribed was terbinafine in 29.88% of cases followed by luliconazole in 27.46% and itraconazole in 17% of cases. Other antifungals were also prescribed like amorolfine, clotrimazole, fluconazole, griseofulvin, ketoconazole etc. were also prescribed as follows in Table 2. Also, most common duration of treatment was 15-20 days with once-a-day administration as given in (Table 3).

Antifungals were prescribed by both systemic and topical route. 4445 drugs were prescribedby systemic route from them 51.67% of systemic antifungal drugs i.e., 2297 drugs were prescribed as capsules and 48.32% were prescribed as tablets as shown in (Figure 5).

In topical route of administration 1628 drugs which accounted for 35% of total topical antifungal drugs prescribed were prescribed as a cream, followed by as a lotion which accounted for 1194 (26.2%) of drugs as shown in (Figure 6). Various other classes of drugs apart from antifungals were also prescribed, from which the second most common drugs were antihistamine drugs.

Among the antihistamine drugs prescribed most common drug was cetirizine which was prescribed in 77.35% of prescriptions followed by hydroxyzine in 21%, as given in (Table 4). In our study all the prescription were analysed with the help of who core indicator.[13] It wasseen that 2.7 drugs were prescribed on an average per prescription and 44% of drugs were from essential medicine list as shown in (Table 5).

DISCUSSION

Dermatophytosis is a superficial fungal infection with diverse distribution as per age or gender. Our study showed 1.23:1 (male: female ratio) which was in accordance to the study conducted by Koshley et al, which showed 1.3:1 ratio and was 1.4:1 in trial conducted by Chaudhary et al.[14,15] In our study it was seen that tinea crusis as the most common type of dermatophytosis followed by tinea cruris and tinea corporis combined. This result was in accordance with the result seen in trial conducted by Mukherjee et al.[16] In our study terbinafine was the most common oral antifungal prescribed and luliconazole was the most topical antifungal. Cetirizine was prescribed in almost 77.64% of patients. This result slightly different from the study by Giri et al which showed majority of oral prescription of terbinafine but sertaconazole was most commonly prescribed topical antifungal.[17]

This was also in accordance with study by Narang et al which also showedterbinafine and topical azoles as the most common drugs used in dermatophytosis.[18] In a study conducted by Kamerkar et al it was seen that 58.28 % of drugs were prescribed as oral formulation and 41.71% were prescribed as topical formulation which was slightly different from the result obtained in our study showing 49.42% oral and 50.57% as topical prescription. Study by Kamerkar et al also showed ketoconazole as most common antifungal followed by terbinafine.[19] In our study average number of drugs prescribed per prescription was 2.7 which was different than in the study conducted by Anuj et al

which showed 5.13 as average number of drugs prescribed per prescription.[20]

Limitations

The limitation of current studies includes a smaller number of patients from extremes of ages (less than 15 years and more than 60 years of age).

CONCLUSION

Most commonly used drugs in dermatophytosis is terbinafine, itraconazole, luliconazole, sertaconazole, cetirizine, hydroxyzine etc. According to this study 44% drugs were from essential medicine list which can be increased. The results of most commonly prescribed drug were according to normally followed trend. This study showed majority prescription was written rationally. The physician must try and prescribe more rationally according to the guidelines given by Indian journal of dermatology. Newer antifungals like sertaconazole or eberconazole with more efficacy should be incorporated in management of tinea. Various cheaper drugs are available but their efficacy is not satisfactory so a bioavailability study comparing various brand can be done. There is also the need of creatingmore awareness about the rational use of topical steroids to decrease the emergence of tinea incognito.

ACKNOWLEDGEMENTS

Authors are thankful to department of dermatology and veneral disease for providing the initial data.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee

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Cite this article as: Badar VA, Gaikwad P, Pradhan K, Chavan R. Drug utilization study of patients with dermatophytosis attending dermatologyoutpatient department in tertiary care teaching hospital in Central India. Int J Res Med Sci 2023;11:2196-201.