



## Drug utilization pattern for dermatophytosis in Dermatology OPD of a tertiary care hospital – A Prescription Survey

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### Abstract:

**Introduction:** WHO is advocating the promotion of rational use of drug by promoting the implementation of standard treatment guideline and essential drugs. Since drug utilization study is an effective tool to promote rational prescribing the present study was planned to define the pattern of drug use for the Dermatophytosis and to evaluate their rationality

**Material and Methods:** It was a prospective, observational study. Total 213 prescriptions of Dermatophytosis were analyzed. WHO prescribing indicators like average number of drugs per encounter (C), percentage of drugs prescribed by generic name (E), percentage of encounters with an antibiotic prescribed (G), and percentage of encounters with an injection prescribed (I) were analysed in present study and compare with gold standard.

**Results:** Out of 213 patients 142(66%) were males and 71 (34%) were females. Tinea cruris constituted the majority of cases (77%) followed by Tinea corporis (70%) and Tinea faciei (9%). Average no. of drugs prescribed per encounter were 3.23 which were significantly higher ( $p < 0.05$ ) as compared to WHO optimal value. Around 11.9% drugs were prescribed by their generic names significantly lower ( $p < 0.05$ ) as compared to WHO optimal value. 45% of drugs were from national essential medicines list (NELM 2019) significantly lower ( $p < 0.05$ ) as compared to WHO optimal value.

**Conclusions:** Present study was aimed to help the physicians in prescribing rational and affordable treatment to their patients. This will also help in the mission of providing “Health care to all”

**Key words:** drug , dermatophytosis, prescribed, utilization

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### **Introduction**

Skin diseases are the major contributors of disease burden in the society. It affects individuals of all ages, from neonates to elderly.<sup>1</sup> Skin diseases in developing countries have a serious impact on people’s quality of life and bring out significant burden to the nations.<sup>2</sup> This eventually increases financial burden as most of the skin diseases are chronic and requires long duration of treatment.

Superficial fungal infections are seen to be the most common fungal infections. According to World Health Organization (WHO), the prevalence rate was found to be 20-25% of superficial mycotic infection worldwide. It was seen more prevalent in tropical and subtropical countries like India where the heat and humidity is high for most part of the year.<sup>3</sup>

Dermatophytosis is the most important group of superficial fungal infections which is caused by dermatophytes, which is a group of fungi that are capable of growing by invading the keratin of skin, hair, and nail for obtaining nutrients.<sup>4</sup> Although it can be persistent as a troublesome, they are not debilitating or life-threatening, yet millions of dollars are expended annually in the treatment of dermatophytosis. Being superficial, dermatophytes (ringworm), infections have been recognized since antiquity.<sup>5</sup>

Pharmacoepidemiology includes drug utilization research, which can constitute guidelines for improving the utilization pattern of drugs as well as provide economic benefits in the use of drugs by patients.<sup>6</sup> Irrational prescription of drugs is a common occurrence in clinical practice seen. The cost of such irrational drug use is enormous in developing countries

considering both the scarce resources and the adverse clinical consequences of therapies that may have real risks but no objective benefits.<sup>7</sup>

In India, it has been seen that there are various problems in prescription pattern of drugs like irrational drug combinations, overuse of multivitamins, unnecessary use of antibacterial in fungal conditions and prescribing drugs from same class.<sup>8</sup>

It contributes to the emergence of antimicrobial resistance. Considering about the Dermatologists, it account for almost 5% of antibiotic prescriptions worldwide and most of the conditions may require prolonged treatment. Further, the skin conditions are also sometimes wrongly diagnosed and treated. Thus continuous monitoring is needed to evaluate pattern of the drug and to detect if any changes from contemporary practices or available guidelines. Hence in order to generate data, there is need of the hour for drug utilization studies.<sup>9</sup> Keeping these facts in consideration and since drug utilization study is an effective tool to promote rational prescribing the present study was planned to study the drug utilization pattern in dermatology outpatient department by using World Health Organization (WHO) prescribing indicators and also to analyze demographic data, various dosage form of drug prescribed, drug and disease distribution for Dermatophytosis.

### **Material and Methods:**

It was a prospective, observational study. It conducted over a period of 2 years in newly diagnosed cases attending outpatient department of Skin OPD of a Tertiary Care Hospital. Informed consent was taken from every patient. Institutional Ethical approval was obtained. During the study 213 prescriptions of Dermatophytosis were analyzed

Following criterion indicators were used : site of infection, frequency and dosage form, comorbid conditions influencing prescription pattern, WHO prescribing indicators and prescription format. Prescription format consisted of demographic variables like name,

address of prescriber, generic name of the drug, strength of drug, dosage form, total amount of drug, label :instruction and warnings, name, address, age and gender of patient, signature or initials of prescribers.

WHO prescribing indicators like average number of drugs per encounter (C), percentage of drugs prescribed by generic name (E), percentage of encounters with an antibiotic prescribed (G), and percentage of encounters with an injection prescribed (I). Average number of drugs per encounter (C) identifies the degree of polypharmacy. Percentage of drugs prescribed by generic name (E) measures tendency to prescribe by generic name. Percentage of encounters with an antibiotic prescribed (G) assesses the prescribing frequency of antibiotics in Dermatophytosis.

Percentage of drugs prescribed from essential drugs list formulary (K) measure the degree to which practices conform to a national drug policy, as indicated by prescribing from the national essential drugs list or formulary for the type of facility surveyed. The optimal values for prescribing indicators were taken from previous studies<sup>10</sup> (**Table 1**)

### **Statistical Analysis:**

Data obtained was entered in Microsoft Excel. Statistical Product and Service Solutions (SPSS) version 21 for Windows (Armonk,NY:IBM corp software was used to analyse the data. Statistical analysis was done by using tools of descriptive statistics such as Mean, and SD for representing quantitative data. Qualitative data was represented by percentage/proportion. Student 't' test was used to compare current study mean indicator with WHO mean indicators. Chi square test was used to compare current study indicator (in %) with WHO indicators percentages.

## **Results:**

Out of 213 prescriptions of Dermatophytosis, only 5 prescriptions were found to have comorbidities. Out of 213 patients 142(66%) were males and 71 (34%) were females. The male to female ratio was found to be around 2:1. Patients between 16-30 years accounted for 48% followed by 31-46 years (38%), 46-60 years (10%), 1-15 years (3%) and 61-80 years (1%). Mean age of study participants was 42.6 years.

Tinea cruris constituted the majority of cases (77%) followed by Tinea corporis (70%) and Tinea faciei (9%) [Graph 1]. Total number of 688 drugs were prescribed in 213 prescriptions. Average no. of drugs per prescription was 3.23. Out of 688 drugs prescribed, 332 (48.2%) were oral and 356(51.7%) were topical. Tablets were the maximum prescribed (46.9%) followed by lotion ( 25.45%) , powder (18.16%) and capsules (7.03%). Clotrimazole dusting powder was prescribed maximum (40%) followed by Luliconazole (38%), Sertaconazole (21%) and Ketoconazole (1%) [Graph 2]. Amongst the oral antifungal drugs, Itraconazole was maximum used (47%) followed by Fluconazole (16.6%), and Terbinafine (0.6%)

Average no. of drugs prescribed per encounter in current study was 3.23 as compared to 1.6-1.8 value of WHO optimal value which was found to be highly statistical significantly greater( $p<0.001$ ). Only 11.9% drugs were prescribed by their generic names which was found to be highly statistical significantly lower ( $p<0.001$ ) as compared to 100% of WHO optimal value.45% of drugs were from national essential medicines list ( NELM 2019) which was found to be highly statistical significantly lower ( $p<0.001$ ) as compared to 100% of WHO optimal value. (Table 2)

## **Discussion:**

This was a prospective, observational study conducted over a period of 2 years in newly diagnosed cases attending outpatient department of Skin OPD of a Tertiary Care Hospital. The study mainly focuses on prescription analysis with regards to WHO prescribing indicators so as to suggest the relevant changes if any to the prescribers. This will also ensure a step towards rational prescribing.

In the present study male to female ratio was 2:1, which is comparable with study by Bhatia V et al<sup>11</sup> where the ratio was 2.03:1. Study by Adane Bitew et al<sup>12</sup> (1:1.3), M. Ogutu et al<sup>13</sup> (1.1:1) and Das S et al<sup>14</sup> (1: 1.7) had different ratios as compared to the present study.

In this study patients between 16-30 years accounted for 48% followed by 31-46 years (38%), 46-60 years (10%), 1-15 years (3%) and 61-80 years (1%). The study by Das S et al<sup>14</sup> which had 61% of young adults between 18–40 years of age.

Bhatia VK et al<sup>11</sup> had the most effected age group of 21–50 years (64.9%) followed by 1–20 years (28.4%) and above 50 years (6.8%). The increased incidence of dermatophytosis in this age group may be due to the fact that this population group takes part in maximum outdoor activities such as agriculture and manual labor, which predisposes them to acquire infection from environmental exposure. However Bindu et al.<sup>15</sup> observed a higher prevalence in the age group of 11–20 years.

In the present study, amongst the various tinea infections, tinea cruris and corporis were found to occur frequently but the infection was found to be non-seasonal. The present study had majority of patients of tinea corporis which is comparable to study by Bindu et al<sup>15</sup> where tinea corporis is 54.6%. Similar observation was not seen in a study by Grover S et al<sup>16</sup> where TCO was 15.5%. This could be because of less sample size as compared to our study.

In the present study average number of drugs prescribed per prescription were 3.23 which was far more when compared with the standard.WHO recommended value of 1.6-1.8<sup>[10]</sup> and which is comparable with the study of Chandrajeet Y et al <sup>17</sup> where the average number of drugs prescribed per prescription was 3.18. Similarly in study done by Gopimohan p et al <sup>18</sup> average number of drugs prescribed per prescription were 3.12. Study by Vegada BN et al <sup>19</sup> however had average 2.98 .Polypharmacy was evident in dermatology OPD for treatment of Dermatophytosis. Average number of drugs per prescription must be kept as low as possible to avoid drug interactions, adverse drug reactions and increased cost of prescription.However in our study these number of drugs were necessary to tackle tinea infection which spreads fast and has lots of itching, which needs oral and topical drugs both.

The present study had 11.89% drugs prescribed by generic name which is too low compared to the standard WHO ideal value of 100%, and 88.11 % by brand name.This was very similar to study by Deb p et al<sup>20</sup> where the generic drugs prescription was 20.26 %.However in study by Chandrajeet Y<sup>17</sup> the percentage of drugs prescribed by generic name was zero. To use generic names in prescription is ideal , however in the present study more brand names were used , which may have been due to quality issue concern. The pharmaceutical representatives may also influence physicians in using brand names instead of generic. There are less chances of dispensing errors in generic prescribing & also reduces the economic burden to the patient because generic drugs are cheaper as compared to branded drugs.<sup>21</sup>

In the present study percentage of encounters with antimicrobial prescribed were zero% which is similar to the other studies done by Deb et al <sup>[106]</sup> and Giri et al.<sup>22</sup> The standard range of 20-26.8% of the WHO prescribed values for antimicrobial use. This is as per our antibiotic policy which emphasizes judicious use of antimicrobial where it is actually necessary. In present study and in the study conducted by Kamerkar SA et al <sup>23</sup> no injectables were used

(WHO ideal value (13.4-24.1%)<sup>10</sup> However in the study by Pathak AK et al<sup>[1]</sup> parenteral forms were very much limited and usually given for severe forms of infections resistant to oral antibiotics, intralesional corticosteroids, and systemic fungal infections.

The percentage of drugs prescribed by the NLEM in our study was 45.50%, which was lower when compared to the ideal standard value of 100%.<sup>10</sup> This finding was almost similar to findings from studies of other parts of India such as Pooja Deb et al<sup>20</sup> &Gopimohan P et al<sup>18</sup> The percentage of prescribing drugs from essential drug list is lower in India when compared to the other countries such as Ethiopia (99%), South Ethiopia (99.6%), and Nepal (88%). This difference which is seen may be due to the lack of awareness of the essential drug list. This brings a need of presence facility indicators such as essential drug list or formulary and availability of key drugs in the dispensing pharmacy. The increase in prescriptions from essential drug list will enhance the compliance of patient to the treatment due to reduced cost.<sup>21</sup>

Following recommendation can be given in order to minimize the irrational prescribing and the risk associated with it. It includes-

- The Formulation of policies related to appropriate use of the medicines
- To formulate a hospital based formulary
- To do regular audit and monitoring of prescription and give the feedbacks of the same to the physicians
- To conduct workshops of rational prescription writing for the health care provider.



## **Conclusion:**

The study concludes that dermatophytosis is widespread in India. The observations suggest the prescribers to consider age, economic status, occupation and family history before writing any prescription. The study also suggests the prescribers to consider factors of polypharmacy, use of generic drugs and the use of drugs from the essential drug list.

Majority of prescriptions were rational. Effective and safe topical antifungal agents were prescribed. Current standard treatment guidelines should be followed to enhance the effectiveness of treatment. More sensitization of the prescribers regarding rational prescribing is needed which can be done by the Pharmacology department regularly by conducting seminars/ workshop for the same ensuring future prescriptions being more rational and cost effective. Further research studies are needed for safe and effective topical as well as systemic antifungals.

## **References:**

- [1] Pathak AK, Kumar S, Kumar M, Mohan L, Dikshit H. Study of Drug Utilization Pattern for Skin Diseases in Dermatology OPD of an Indian Tertiary Care Hospital - A Prescription Survey. *Journal of Clinical and Diagnostic Research : JCDR*. 2016; 10 (2): FC01-FC05.
- [2] Joel JJ, Jose N, Shastry CS. Patterns of Skin Disease and Prescribing Trends in Rural India *Sch Acad J Pharm*. 2013; 2(4): 304-09.
- [3] Sahoo AK, Mahajan R. Management of tinea corporis, tinea cruris, and tinea pedis: A comprehensive review. *Indian dermatology online journal*. 2016 Mar; 7(2): 77.

- [4] P Ganeshkumar, M Hemamalini, ALakshmanan, R Madhavan, S RaamMohan. Epidemiological and clinical pattern of dermatomycoses in rural India. *Indian Journal of Medical Microbiology*. 2015; Vol. 33, No. 5:134-136.
- [5] Kumar S. Superficial, Cutaneous and Subcutaneous Mycoses. *Textbook of Microbiology*. 1<sup>st</sup> ed. New Delhi: Jaypee Brothers Medical Publisher; 2012: p.652-653.
- [6] Ahmed MW, Dass P, Ahmed R, Gulabani M. Drug utilization study of anti-microbial agents in Mahagaon Primary Health Centre in rural Gulbarga, Karnataka. *Primary Health care*. 2014 Jul 7; 67(4): 5
- S. P. Narwane, T. C. Patel, Y. C. Shetty and S. B. Chikhalkar. Drug
- [7] Utilization and Cost Analysis for Common Skin Diseases in Dermatology OPD of an Indian Tertiary Care Hospital - A Prescription Survey. *British Journal of Pharmaceutical Research*, 2011; 1(1): 9-18.
- [8] Hogerzeil HV. Promoting rational prescribing: an international perspective. *Br J Clin Pharmacol*. 1995; 39:1-6.
- [9] Divyashanthi CM, Nandhini A, Kumar SA. Study on drug utilization pattern of antibiotics among dermatology in-patients of a tertiary care teaching hospital, Karaikal, Puducherry. *Int J Basic Clin Pharmacol*. 2014; 3(6): 1072-77.
- [10] Atif M, Azeem M, Sarwar MR, Shahid S, Javaid S, Ikram H, Baig U, Scahill S. WHO/INRUD prescribing indicators and prescribing trends of antibiotics in the Accident and Emergency Department of Bahawal Victoria Hospital, Pakistan. *Springerplus*. 2016 Dec; 5(1):1-7.
- [11] Bhatia VK, Sharma PC. Epidemiological studies on dermatophytosis in human patients in Himachal Pradesh, India. *Springerplus*. 2014 Dec 1; 3(1):134.

- [12] Bitew A. Dermatophytosis: prevalence of dermatophytes and non-dermatophyte fungi from patients attending Arsho advanced medical laboratory, Addis Ababa, Ethiopia. *Dermatology research and practice*. 2018;2018.
- [13] Ogutu M, Ngángá Z, Namasaka M, Wambura M. Superficial mycoses among psychiatric patients in Mathari hospital, Nairobi, Kenya. *East African medical journal*. 2010;87(9).
- [14] Das S, De A, Saha R, Sharma N, Khemka M, Singh S, Reja AH, Kumar P. The current Indian epidemic of dermatophytosis: A study on causative agents and sensitivity patterns. *Indian journal of dermatology*. 2020 Mar;65(2):118.
- [15] Bindu V, Pavithran K. Clinico-mycological study of dermatophytosis in Calicut. *Indian Journal of Dermatology, Venereology, and Leprology*. 2002 Sep 1;68(5):259.
- [16] Grover S, Roy P. Clinico-mycological profile of superficial mycosis in a hospital in North-East India. *Medical journal armed forces India*. 2003 Apr 1;59(2):114-6.
- [17] Yadav C K, Barai K, Yadav P. Drug utilization pattern and cost analysis of anti-fungal drugs used in dermatology OPD of a tertiary care teaching hospital (UCMS): A prescription survey . *International Journal of Medical and Health Research*. 2020;6(5) : 67-71
- [18] Gopimohan P, Sudha MJ, Pillai RT, Ramani PT. A study on the prescription pattern of antifungal drugs in the Dermatology Department of a tertiary care teaching hospital in Southern Kerala. *International Journal of Basic & Clinical Pharmacology*. 2019 Jan;8(1):100.
- [19] Vegada BN, Kareli BN, Singh AP. Drug utilization study of antifungal agents used in Department of Skin and venereal disease of a tertiary care teaching hospital. *Int J Pharm Sci Rev Res*. 2015;34(1):118-21.

- [20] Deb P, Mohanty I, Slathia I, Verma V. Drug utilisation and self medication pattern of anti-fungal drugs in dermatology outpatient department of a tertiary care hospital. *Int J Basic Clin Pharmacol*2017;6:2189-92.
- [21] Ragam AS, Acharya S, Holla R. Assessment of drug use pattern using World Health Organization prescribing indicators in a tertiary care hospital in Mangalore: a cross-sectional study. *National Journal of Physiology, Pharmacy and Pharmacology*. 2017;7(10):1026.
- [22] Giri VP, Giri OP. Drug Prescribing Pattern in Dermatophytosis at the Medical Outpatient Clinic of a Tertiary Healthcare in Karnataka, India. *Medicine Science*. 2015;4(3):2465-72.
- [23] Kamerkar SA. Prescription Pattern and the Cost Analysis of Tinea and Acne Patients in the Dermatology Department of a Tertiary Care Teaching Hospital.

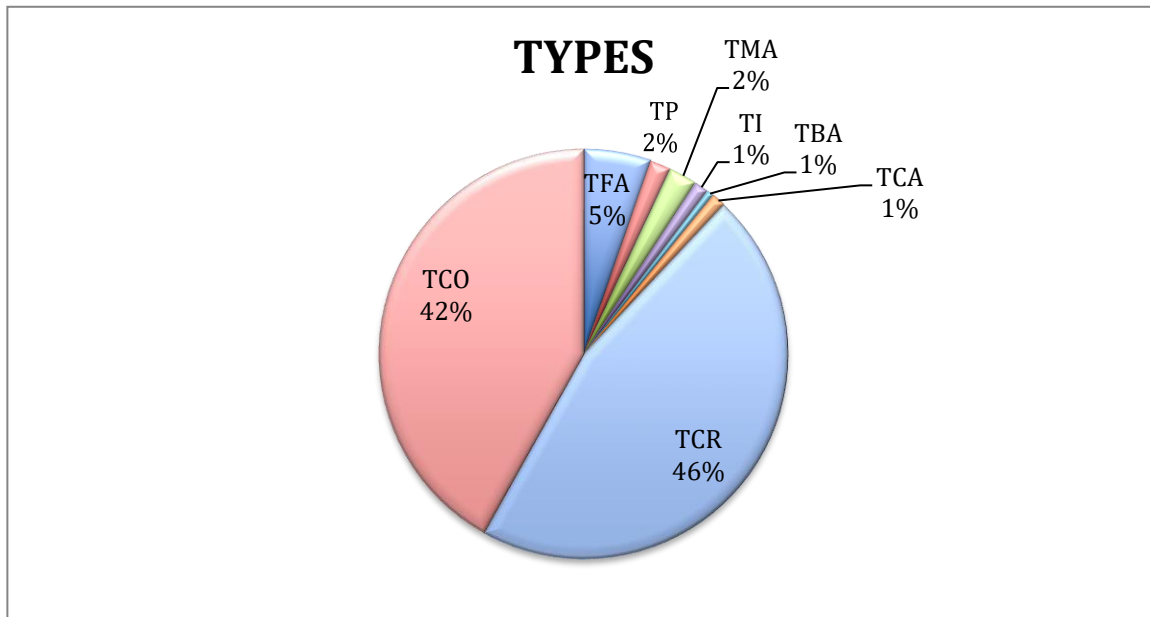
**TABLE 1: World Health Organization ( WHO) drug prescribing indicators**

World Health Organization ( WHO) drug prescribing indicators.	WHO Optimal value <sup>[115]</sup>
Average no.of drugs per encounter	1.6-1.8
Percentage of drugs prescribed by generic name	100
Percentage of encounters with antibiotic prescribed	20-26.8
Percentage of encounters with an injection prescribed	13.4-24.1
Percentage of drugs prescribed from essential drug list	100

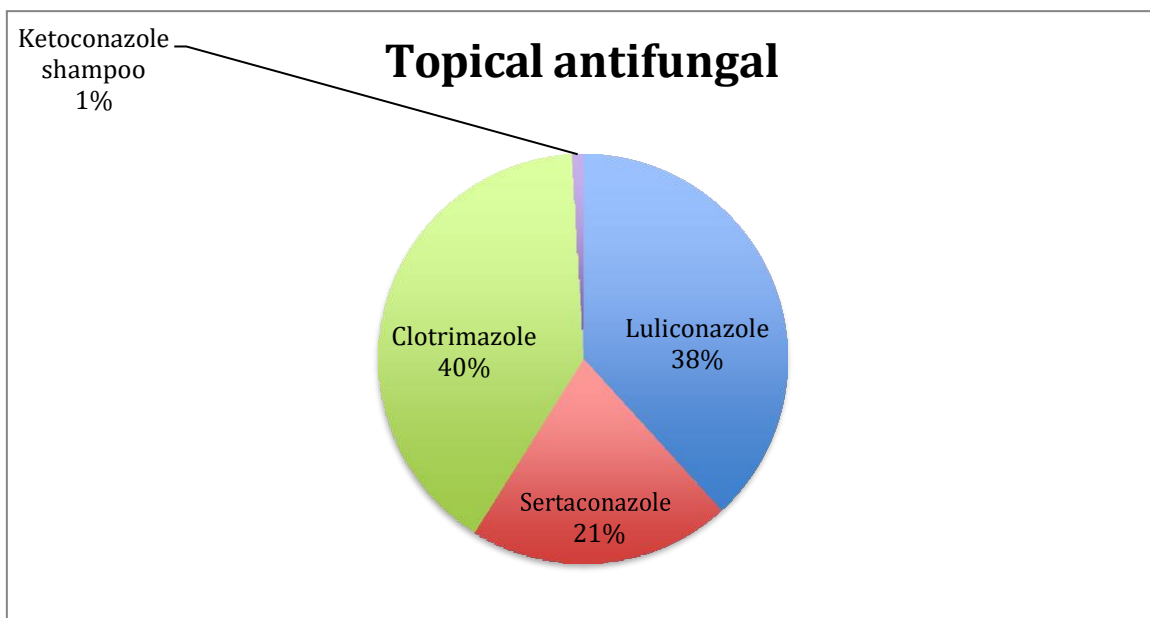
**Table 2: Comparison of present study with World Health Organization (WHO) drug prescribing indicators.**

World Health Organization ( WHO) drug prescribing indicators.	Number in present study	WHO optimal value	p value
Average no.of drugs per encounter	3.23	1.6-1.8	p<0.001*
Percentage of drugs prescribed by generic name	11.89%	100	p<0.001*
Percentage of encounters with antibiotic prescribed	0.00%	20-26.8	----
Percentage of encounters with an injection prescribed	0.00%	13.4-24.1	----
Percentage of drugs prescribed from essential drug list	45.50%	100	p<0.001*

p<0.001 – highly significant statistical difference



**Graph 1: Types of Tinea infections among Dermatophytosis prescriptions**



**Graph 2: Different topical antifungal drugs**