

## Drug Utilization Pattern in Dermatology Out Patient Department in Tertiary Care Teaching Hospital in Southern Rajasthan

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### Abstract

**Background:** Skin diseases are the major contributors of disease burden in society. It affects individuals of all ages, neonates to elderly. Owing to its chronic nature, it causes serious impact on quality of life and financial status of the sufferer and his family. This study aims to determine the drug utilization pattern and assess the economic burden of the patient with skin disease.

**Methods:** This prospective, cross-sectional, observational study was conducted in Dermatology outpatient department of Maharana Bhopal Hospital Udaipur, a tertiary care teaching hospital in southern Rajasthan. The study was conducted over a period of 11 months (May2020 – March2021) in Dermatology outpatient department, MB Hospital, Udaipur, a tertiary care teaching health center in southern Rajasthan. All the Patients (Male & Female) who were visiting the outdoor unit of Dermatology department were included. Sample size of 400 prescriptions was taken into consideration.

**Result:** Antihistaminic drugs were maximally utilised drugs in our study followed by antifungal drugs. Among antihistaminics, Tab. Levocetirizine was maximally utilised drug while vitamin E, Terbinafine, Cotrimoxazole and calcium+vitaminD3 were the minimum utilized drugs. The costliest drug prescribed was Cap.Itraconazole while minimum costliest drug was Tab. Methotrexate. Average cost per encounter was Rs. 64.27/-. 100% of drugs were prescribed with generic name, which was similar to WHO standard (100%). 86.96% of drugs were prescribed from essential drug list (EDL), which was according to WHO standard (80-100%).

**Conclusion:** We concluded that maximum patients who attended dermatology OPD were of fungal infections followed by dermatitis. Maximum number of patients received three drugs per prescription for various dermatological disorders which was within the WHO standard (2-3).

**Keywords:** Drug utilization, Dermatology, OPD, Prescribing pattern

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## Introduction

World Health Organization (WHO) defines Drug Utilization as marketing, distribution, prescription and use of drugs in society, with special emphasis on the resulting medical, social, and economic consequences [1]. Study of drug utilization trends are powerful, exploratory tools to ascertain role of drugs in medical practice.

Such studies lay emphasis on the various determinants encompassing the prescribing, dispensing, administering, and related events, including medical as well as nonmedical aspects of drug utilization, its varied effects and consequences on drug use, beneficial or adverse [2,3]. The field of drug utilization may be extended linking prescription data to the cause of prescribing drug. It involves the concept of appropriateness which has to be assessed relative to treatment, concomitant diseases (that might contraindicate or interfere with chosen therapy) and other drug usage (interactions) [4].

The Dermatology outpatient department forms an important platform for conducting drug utilization studies as patients present with a wide range of diseases and the drug use is quite extensive. Therefore, evaluating the drug prescribing behavior and usage patterns in Dermatology outdoor harbinger the potential of determining the rationality of drug therapy being given in this particular region to a wider extent.

With such perspectives in view, this study is planned to be conducted in our tertiary care teaching hospital laying emphasis on pattern of drug use with cost of drug treatment and determination of the rationality of prescriptions. With a goal of improving the health policies of the institution, feedback will be provided to the concerned department. Keeping these facts in consideration the present study has been planned to define the pattern of drug use for the common skin conditions, their availability in the hospital pharmacy and to evaluate the cost analysis of each

prescription in the Dermatology outpatient Department at Tertiary care teaching hospital in Southern Rajasthan.

## Material and Methods

Drug utilization research is a health service research to quantify, understand, evaluate and quality improvement of prescribing, dispensing and consumption of drug.

This prospective, cross-sectional, observational study was conducted in Dermatology outpatient department of Maharana Bhopal Hospital Udaipur, a tertiary care teaching hospital in southern Rajasthan. The study was conducted over a period of 11 months (May2020 – March2021) in Dermatology outpatient department, MB Hospital, Udaipur, a tertiary care teaching health center in southern Rajasthan. All the Patients (Male & Female) who were visiting the outdoor unit of Dermatology department were included. Sample size of 400 prescriptions was taken into consideration.

## Inclusion Criteria

All patients (both male and female) of age above 18 years who came in Skin outpatient department from May2020 – March2021

## Exclusion Criteria

1. Subjects with severe ailments those shifted to the indoor
2. Pregnant women.
3. All patients of age group less than 18 years

A standard subject socio demographic and clinical features data collection form was prepared and the characteristic like age, gender, occupation, income group subject IP/OP number was recorded. Information regarding diagnosis, subject present/past medical history, treatment, any ADR, investigations, outcome, patient's knowledge about drug treatment, self-medication was collected from outdoor prescription card. Patients interview and

the attending physician were entered in the proforma. Drug utilization pattern among skin outdoor patients was evaluated using following quality indicators of drug use, recommended by WHO.

### Statistical Analysis

The data collected was analysed and entered in the 'prescribing indicator form' manually and statistical tools like averages/means and percentages were

applied in this study (regarding number of drugs prescribed, average no of drugs prescribed per prescription, relationship between patient demographics and prescription patterns, indications for which various drugs were prescribed, percentage usage of various drugs and dosage forms of the drugs and polypharmacy etc.). Data was analyzed by entering it into a Microsoft excel sheet and applying descriptive statistics.

### Results

**Table 1: General characteristics**

Male : Female	256 : 144
Mean age	35.23±12.36 years
Route of drug administration (oral : topical)	722:508
<b>Average No. of Drugs per encounter</b>	<b>3.075</b>
<b>Total No. of Drug prescribed</b>	<b>1230</b>
<b>No. of Drugs used</b>	<b>46</b>
<b>Max. used drug (No.)</b>	<b>Levocetirizine (318)</b>

Total no. of patients included was 400. Out of them 256 (64%) were male patients and 144 (36%) were female patients. Age of patients included in our study was more than 18 years, among whom patients between 18-27 were maximum that is 112(28%). Total number of drugs administered by oral route was 722 (58.69%) and by topical route was 508 (41.30%).

**Table 2: Distribution of encounters based on number of drugs prescribed**

	No. of cases (n)	Percentage
Single drug	10	2.5
Two drugs	80	20
<b>Three drugs</b>	<b>222</b>	<b>55.5</b>
Four drugs	54	13.5
Five drugs	28	7
Six drugs	4	1
Seven drugs	2	0.5
<b>Total</b>	<b>400</b>	<b>100 %</b>

Maximum number of patients (n=222, 55.5%) received three drugs for dermatological disorders. Most commonly prescribed monotherapy drug was tablet levocetirizine in 318 patients (79.5%).

**Table 3: Prescribing pattern of different group of drugs among patients**

Group	No. of encounters	Percentage
<b>Antihistaminics</b>	<b>350</b>	<b>28.5</b>
Antifungals	322	26.2
Steroids	162	13.2
Antibiotics	94	7.6
Anti-acne	70	5.7
Anti-parasitics	26	2.1
Antivirals	12	1

Others	194	15.7
<b>Total</b>	<b>1230</b>	<b>100%</b>

Levocetizine was the maximally utilized drug and prescribed to 318(79.5%) patients while vitamin E, Terbinafine, Cotrimoxazole and calcium+vitaminD3 were the minimum utilized drugs and prescribed to 2(0.5%) patients among orally prescribed drugs. Betamethasone was maximally prescribed to 120(30%) patients and povidine ointment, Mometasone cream, kojic acid cream and clotrimazole oral paint were minimally prescribed to 2(0.5%) patients among topically used drugs. Other utilized drugs were Itraconazole, Chlorpheniramine maleate, Omeprazole, vitamin C, Cap. Pregabaline, Prednisolone, Multivitamins, Cefixime, Cap. Doxycycline, B-Complex, Amoxyclave, Griseofulvin, Fluconazole, Analgesics, Acyclovir, Zinc, Tab.Azithromycin, Methylcobalamine, Methotrexate, Iron folic acid, Folic acid, Miconazole, Clotrimazole, Fusidic acid cream, Permethrin cream, Zinc calamine lotion, Tretinoin cream or ointment, White petroleum jelly, Clobetasol cream, Clindamycin gel, Moisturising white soft+liquid paraffin, Ketoconazole shampoo, Desonide cream and Tacrolimus ointment.

**Table 4: Number and percentage of prescriptions based on the cost**

Cost of prescription (in Rs.) per patient	Number of prescription(n)	Percentage (%)
<b>Less than 100</b>	<b>294</b>	<b>73.5 %</b>
101-150	96	24 %
150-200	6	1.5 %
Above 200	4	1 %
<b>Total</b>	<b>400</b>	<b>100%</b>

**Average drug cost per encounter =**

$$\frac{\text{Total cost of all drugs prescribed}}{\text{Number of encounter surveyed}} = \frac{25711.18}{400} = \text{Rs. 64.27/-}$$

Out of 400 prescriptions, the maximum number of prescription cost was in between the range of less than Rs 100 /- (n = 294, 73.5%) and least number of prescription was in the range of above Rs 200 /- (n=4, 1%).

The average cost per encounter = **Rs. 64.27/-**

**Maximum Prescribed** = Tab. Levocetizine (Oral dugs)

Betamethasone cream (Topical drugs)

**Maximum Cost** = Cap. Itraconazole (Oral dugs)

Fusidic acid cream (Topical drugs)

**Non EDL** = 6 drugs out of 46 = **13.04 %**

**EDL** = 40 drugs out of 46 = **86.96 %**

**WHO prescribing indicators data**

**1. Average number of drugs prescribed per encounter =**

$$\frac{\text{Total number of drugs prescribed}}{\text{Number of encounters surveyed}} = \frac{1230}{400} = 3.075$$

**2. Percentage of drugs prescribed by generic name =**

$$\frac{\text{Number of drugs prescribed by generic name}}{\text{Total number of drugs prescribed}} \times 100 = \frac{46}{46} \times 100 = 100\%$$

### 3. Percentage of encounter with antibiotic prescribed =

$$\frac{\text{Number of encounters with antibiotic prescribed}}{\text{Number of encounters surveyed}} \times 100 = \frac{138}{400} \times 100 = 34.5\%$$

### 4. Percentage of drugs prescribed from EDL=

$$\frac{\text{Number of drugs prescribed from EDL}}{\text{Total number of drugs prescribed}} \times 100 = \frac{40}{46} \times 100 = 86.96\%$$

## Discussion

A prescription by a doctor may be taken as an indication of the doctors' attitude towards the disease and the role of drugs in its treatment. Prescription is a written instruction given by a qualified medical practitioner with the intent to provide medicine or treatment for the benefit of the patient. Thus, the prescription in other words reflects the doctor's knowledge and his attitude to treat the patient with due consideration of the patient's condition physically as well as financially. Availability and affordability are the two major determinants of a prescription and various other very important parameters are quality, rationality, completeness and cost per prescription. And one study that incorporates all these components is the drug utilization study. Till now very few drug utilization studies have been conducted in our institute and thus we did not have any comparable data of other studies from our institute [4].

An average number of drugs per prescription is considered as an important index of prescription analysis. In our study, number of drugs per prescription ranges from 1 to 7 and average drug per prescription was 3.075. The similar study conducted by Sarkar *et al* and Narwane *et al* [5-6]. In all these studies average number of drugs prescribed per prescription was 2.72, 2.42 and 2.7 respectively and it indicates higher number

of drugs prescribed per prescription in our study. On the other hand, the average number of drugs prescribed per prescription in the study conducted by Sangeetha Laxmi *et al* [7] was 3.73 in male OPD and 3.59 in female OPD, and 5.13 in study conducted by Pathak *et al*. [8].

In our study, among all utilised group of drugs, antihistaminic group of drugs were prescribed maximum in number followed by antifungal group of drugs then steroids, antibiotics, antiacne drugs, antiparasitic drug, antiviral drug and some other drugs. The similar results were observed in the study conducted by Pathak *et al*. [8] in which the most commonly prescribed drugs were antihistaminics (45.02%) followed by antifungal drugs (39.6%) and steroids (27.8%). Similar study was conducted by Sangeetha Lakshmi GNS *et al*. [7] in which, in oral formulations, antihistamines were the most common class of drugs prescribed in male and female OPD. Anti-bacterials were the second most common class of drugs in female OPD as acne vulgaris was the most common diagnosis. In male OPD, anti-fungals were the second most common class of drugs as T. Tinea Corporis with Tinea Cutis was the most common diagnosis.

Similar study conducted by Anuj Kumar Pathak *et al.* [8] and Narwane SP *et al.*, [5] in which antihistaminics was the most commonly prescribed drug class, followed by antifungals and antibiotics

Most probable reason for the maximum use of antihistaminic drugs could be due to itching associated with many dermatological conditions like fungal infections, eczema, psoriasis, scabies etc.

In our study, among antihistaminic drugs, levocetirizine was prescribed more than chlorpheniramine maleate, that is to 318(90.9%) patients and chlorpheniramine maleate was prescribed to 32(9.1%) patients. While in study by Anuj Kumar Pathak *et al.* [8] and Narwane SP *et al.*, [5] levocetirizine was the most commonly used antihistaminic drug, followed by hydroxyzine.

In our study, among antifungal group of drugs, itraconazole was the most commonly prescribed drug. Among oral antifungal drugs, itraconazole 134(41.61%) was maximally prescribed drug followed by fluconazole 12(3.72%) and griseofulvin 12(3.72%). Among topical antifungal drugs, Miconazole 84(26.1%) was maximally prescribed drug followed by clotrimazole 70(21.73%). The results in the study conducted by Anuj Kumar Pathak *et al.*[8] were different in this regards from our study, where topical antifungal clotrimazole, ketoconazole, terbinafine etc. were prescribed more frequently (82.12%) than the oral antifungals like fluconazole and itraconazole.

Topical agents were prescribed in maximum number of patients in all studies. This may be due to various side effects associated with systemic steroid therapy as well as its site specific action, less systemic absorption resulting in less side effects and convenient for patient use. Topical corticosteroids are mainly used for non-infective dermatologic disorders such as atopic dermatitis and contact dermatitis, lichen planus, psoriasis etc.

In our study, among antibiotics and antiseptics group of drugs, fusidic acid cream was most commonly used. Among oral antibiotics, cefixime and amoxicillin+clavulanic acid were prescribed equally, which was to 14(14.9%) patients. Among topical antibiotics including antiseptics, fusidic acid cream 64(68.08%) was most commonly used followed by povidone ointment. Doxycycline (20%) and Cotrimoxazole (2.9%) were prescribed only to the patients of Acne vulgaris. In a study conducted by Anuj Kumar Pathak *et al.* 8 antibiotics including antiseptics constitute 16% of prescription.

In our study, among antiacne group of drugs, tretinoin cream (31.4%) was most commonly used drug. Along with oral anti acne drugs, doxycycline(20%) was most commonly prescribed followed by cotrimoxazole (2.9%). Among topical antiacne drugs, tretinoincream(31.4%) was most commonly prescribed to patients followed by clindamycin gel (25.7%). In our study, among other than the above group of drugs, omeprazole 22(11.3%) and zinc calamine lotion 22(11.3%) was most commonly used drug in our study followed by white petroleum jelly 20(10.3%), vitamin C 18(9.3%). In a study conducted by Anuj Kumar Pathak *et al.*, ranitidine and pantoprazole were the most commonly prescribed drugs. Omeprazole was preferred over ranitidine in our study, it has better tolerability and less side effects. Multivitamins, retinoids, immunosuppressants, paracitides etc were also prescribed in the study by Pathak *et al.*,[8] for the treatment of particular disease but individually these contributed to very small percentage of cases.

In our study, different types of dosage forms were used, in which tablet (43.41%) were most commonly used dosage form followed by cream (31.86%) while throat paint (0.16%) was least commonly used dosage form among all dosage forms. Other dosage forms includes capsule, lotion, jelly, gel, emollient, ointment,

shampoo. Injectable drug were not used in our study. Margin of safety is higher with oral drugs as compare to parenteral drugs.

In our study, 46 types of drugs were utilised in 400 patients. Drugs from essential drug list were 40(86.96%) and from non-EDL were 6(13.04%). The costliest drug prescribed was Cap. Itraconazole 100mg, prescribed to 134 patients. Cost per patient for itraconazole was Rs. 109.04/-. In terms of cost, minimum costliest drug was Tab. Methotrexate 10 mg, given to 6 patients. Cost per patient for methotrexate was Rs. 1.0878. Total cost of all the drugs utilized during our study duration was of Rs. 25711.18 & average cost per encounter was Rs. 64.27/-. The average cost per encounter was 135.60 in study conducted by Narwane S.P. *et al* [5] 487.50 by Pathak *et al.* [8].

This high cost may be attributed to the polypharmacy, absence of generic drugs in prescription as well as high cost of the dermatological products. The study was done in a tertiary care hospital where the prescribing physician is a qualified dermatologist, which cannot reflect the health care facilities available in all health care centers particularly in rural areas.

Irrational drug prescription is a global problem among the physicians and solution has to come from the physicians himself as well as locally in form of appropriate policies and guidelines in accordance with WHO guidelines. Many strategies are being proposed, tested, and implemented to improve the quality of medication use. Opportunities for drug utilization research are still under-explored, but issues related to confidentiality of medical records and limitations in funding and personnel will determine the pace of growth of drug utilization research.

### Conclusion

Drug utilization study is an effective tool to promote rational and cost-effective drug prescribing. Despite all the limitations

such as small sample size, shorter study duration, and single study centre etc the study may prove to be an eye opener for the healthcare provider. This study suggests the prescribers to consider factors as polypharmacy, rationality of prescription and cost benefit analysis before writing any prescription. Hospital authority should also take concrete steps to ensure generic prescribing to reduce the cost of treatment and to sensitize the physicians regularly regarding the need of rational prescribing by conducting continuing medical education.

### Encouraging points of the study

1. Less number of drugs per prescription were prescribed, discouraging polypharmacy
2. All drugs were prescribed by generic name and were from essential drug list
3. Amongst the different routes of drug administration, oral and topical routes were preferred rather than employing parenteral routes of drug administration.
4. Most of the drugs were supplied free of cost to the patient and almost all groups were available. The list of drugs was available in OPD. This indicates quality of patient care provided to the patients
5. Most of drugs were appropriately used, indicating rational use of drugs
6. Minimum cost burden was found for both patient and the government as compared to other studies due to MNDY
7. Use of multivitamins was kept to minimum, indicating rational drug utilization in the institution

### Limitations of the study

1. The drugs were supplied free of cost as government supply, so the cost of different brands could not be calculated.
2. Choice of treatment varies from physician to physician and the study provides no data for the same

3. ADRs could not be reported because follow up was limited
4. Owing to less time spent per patient in outpatient department, proper history of associated diseases, use of alternative and complementary medicines, and patient particulars was sometimes could not be taken.
5. The study was conducted with limited sample size and duration, so the seasonal variation in drug utilization pattern could not be evaluated

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