

## DRUG UTILIZATION STUDY IN OUTPATIENT OPHTHALMOLOGY DEPARTMENT OF A TERTIARY CARE HOSPITAL IN WEST BENGAL

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rational prescribing,  
ophthalmic preparations,  
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### Abstract

**Background:** Drug utilization studies provide a pharmacoeconomic basis for making evidence-based health-care decisions. Periodical auditing of prescribing pattern is vital for promotion of rational use of drugs.

**Aim:** This study was designed with the aim to investigate the utilization pattern in a tertiary care hospital.

**Settings and design:** A prospective, cross-sectional study was conducted for a period of 2 months.

**Materials and methods:** The prescriptions for all consecutive new patients attending the OPD were included and audited using a pre-designed form to record information from the OPD prescription cards of each patient.

**Statistical analysis:** Data analysis was carried out using the descriptive statistics

**Results:** A total of 600 prescriptions were analyzed with the average number of drugs per prescription being 2.6 (0.9). The most common disorders diagnosed were refractive errors (13.3%) followed by cataract, glaucoma and others. 1400 drugs were prescribed in six dosage forms with eye drops being the most common (57.14%) followed by tablets (14.28%), ointment (6.42%), syrup (3.92%) capsules (4.28%), lotion (0.57%) injections contributed 2.14% of the dosage forms prescribed. The frequency of drug administration was recorded in 96.6% and the duration of treatment was mentioned in 80% of the drugs prescribed. Antimicrobials were the most commonly prescribed (39.6%) followed by anti-inflammatory and anti-allergic (26.0%), anti-glaucoma drugs (23.0%), mydriatic and cycloplegics (12.8%), miotics (7.00%). Drugs were prescribed in brand name in 65.6% and that accounted for generic name in 34.3% (481/1400). Conclusion: The study revealed that prescription writing errors were minimum but generic prescribing was low which adds to the economic burden indirectly leading to non-compliance.

### Introduction

Drug utilization research is defined by World Health Organization (WHO) as the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences. Inappropriate use of drugs and dosage forms result in potential health hazard to the patients and cause financial burden. To avoid such problems every member of the healthcare system should practise rationally. The five important criteria for rational drug use are accurate diagnosis, proper prescribing, correct dispensing, suitable packing and patient adherence. [1] The availability and affordability of drugs along with their rational use is crucial for rendering effective health-care. In this perspective, drug utilization study is an important tool in assessing rationality of prescriptions. The current variations in the drug prescribing pattern, concerns over adverse drug reactions and escalation in the pricing of drugs have increased the importance of drug utilization studies. [2] To promote rational use of drugs in developing countries, international agencies like the World Health Organization (WHO) and the International Network for The Rational Use of Drugs have applied themselves to evolve standard

drug use indicators. [3] In ophthalmology practice, rational prescribing plays a crucial role in reducing the ocular disease burden of the country. Though majority of these earlier studies considered WHO suggested prescribing indicators; only one study provided information regarding the ocular disorder from which the patients were suffering.[4] In this context, the present study was conducted to investigate the drug utilization pattern of the ophthalmologists at a tertiary care Medical College in India in the light of WHO suggested drug use indicators.

### Subjects and methods

A total of 600 prescriptions were analyzed following WHO recommendation [4] that the study of a single health facility should measure facility specific prescribing indicators with a 95% confidence limit plus minus 10%. Accordingly, it has been recommended that at least 600 encounters or more should be included in a cross-sectional survey. The study was conducted at the Department of Pharmacology in collaboration with the Department of Ophthalmology.

Permission was obtained from the Institution's Ethics Committee. The ophthalmology OPD of the institute was considered as the sampling unit while data was collected prospectively from the out-patients unit of the Ophthalmology OPD between 8 am and 2 pm, thrice a week in alternate days excluding weekends for a period of 2 months. The prescriptions for all consecutive patients attending the OPD for the first time (first time encounter) were included in the study and audited prospectively using the prescribing indicator form designed by WHO.[3] The form has already been validated by WHO. Patients were explained about the study and informed consent was obtained from them. In the present study, each patient was referred to as a prescription and only those medications used for treating ocular disorders were considered. All drugs prescribed were noted including dose, route, dosage form, frequency of administration, indications for prescription and duration of therapy. These forms were used to analyze average number of drugs per prescription, number of encounters with antibiotics, percentage of drugs prescribed by generic name and whether the dosage form, frequency of administration and duration of therapy were mentioned or not. Numbers of drugs prescribed from essential drug list were also noted. Essential medicines as defined by the WHO are those drugs that satisfy the health-care needs of the majority of the population; they should therefore be available at all times in adequate amounts and in appropriate dosage forms, at a price the community can afford. [5] Central Drugs Standard Control Organization (CDSCO), the regulatory body in India, has formulated the National list of essential medicines three years back in 2011. [6]

### Statistical analysis

The filled-in forms were checked for completeness of data and then analyzed using the statistical package for social sciences (SPSS) program version 21 (Chicago, IL, USA). Data analysis was carried out by using descriptive statistics: Frequency, percentage, mean and standard deviation (SD).

### Results

During the study period, a total of 640 patients attended the OPD for the first time (first time encounter). However, as 40 patients refused to provide their prescriptions to the study team, only 600 prescriptions were available for analysis. The mean (SD) age of these patients was 48.5 (6.0) years. The total number of male patients was 412 (68.6%), than the female counterparts 188 (31.3%) giving a Male: Female ratio of 2.1:1. The total number of drugs prescribed in these prescriptions amounted to 1400. The number of drugs per prescription varied from 1 to 5 [Table 1]. Average number of drugs per prescription was 2.5 (Mean [SD]: 2.6 [0.9]). Patients suffering from various ocular disorders attended the OPD during the study period [Table 2]. The most common disorders diagnosed were refractive errors (13.3% [80/600]) followed by bacterial conjunctivitis, allergic conjunctivitis, cataract, glaucoma, corneal ulcer, stye, squint, foreign body in eye, blepharitis and others. Drugs were prescribed in six different dosage forms with eye drops being the most common (57.14% [800/1400]) followed by tablets (14.28% [600/1400]), ointment (6.42% [90/1400]), syrup (3.92% [55/1400]), capsules (4.28% [60/1400]), lotion (0.57% [8/1400]); injections contributed 2.14% (30/1400) of all the dosage forms prescribed [Figure 1]. The dosage form was mentioned in 97.8% (587/600) of the prescriptions. The frequency of drug administration was recorded in 96.6% (580/600) and the duration of treatment was mentioned in 80% (480/600) of the drugs prescribed.

Amongst the drugs, antimicrobials were the most commonly prescribed (39.6% [555/1400]) followed by anti-inflammatory and anti-allergic (26.0% [365/1400]), anti-glaucoma medications (23.0% [322/1400]), mydriatic and cycloplegics (12.8% [180/1400]), miotics (7.00% [98/1400]), [Figure 2 and Table 2]. Drugs were prescribed in brand name in 65.6% (919/1400) and that accounted for generic name in 34.3% (481/1400). A total of 20% (280/1400) of drugs were prescribed from national essential medicine list.

However, information about the frequency of drug administration was missing in 2% of the prescriptions in the present study compared to 22.1% in the study conducted by Biswas et al.[7 ] and Banerjee et al. [ 4 ]

## Discussion

Drug utilization studies are important for obtaining data about the patterns and quality of use, the determinants of drug use, and the outcomes of use. In view of the advancement in drug development and availability of new ocular therapeutics in the discipline of ophthalmology, we attempted to study the drug utilization and describe the prescribing practices of ophthalmologists in a tertiary care teaching hospital. The WHO drug use indicators are highly standardized and are recommended for inclusion in drug utilization studies [8-10]. The present study attempts mainly to describe the current prescribing pattern and drug utilization with the WHO core prescribing indicators in Ophthalmology Outpatient Department. Average number of drugs per prescription is an important index as it tends to measure the degree of polypharmacy [11]. It provides scope for review and educational intervention in prescribing practices. In our study, the average number of drugs per prescription was 2.50, which demonstrated a restraint on over prescribing and polypharmacy to avoid risk of drug interactions. Many drugs were prescribed by brand name (65.6%) in our study, which suggests much preference of the brands amongst the Ophthalmologists according to the effectiveness of those drugs. This study also revealed that the percentage of drugs prescribed from the National Essential Drug List/National Formulary of India (NEDL/NFI) was only 20 % which is much less compared to two other studies conducted in India [7, 15]. This could be related to lack of awareness and unavailability of NEDL/NFI among the treating eye specialists. Antibiotics were found to be frequently prescribed at the particular time period of our study and number of encounters with antibiotics was found to be as high as 39.6%. Other hospital-based studies [12-16] in India have reported 14%–33% encounters with antibiotics that is less than our study. The high use of antibiotics may reflect various grades of severity of the infections, poverty, low level of literacy, hygiene and sanitation in the region of rural Bengal, where the patients resided during our study period.

*Limitation of the Study:* It was a quantitative type of drug utilization study with the WHO/INRUD core prescribing indicators and therefore determining the quality of diagnosis and the appropriateness of drug choices was beyond the scope of prescribing indicators.

## Conclusion

The prescribing pattern observed in the current study was knowledge-based and in accordance with the accepted patterns of treatment of ocular diseases, but the study showed ample scope for improvement in encouraging the ophthalmologists to prescribe by generic name and selection of essential drugs from NEDL/NFI. The study suggests educational initiative, development of drug policy, and NEDL based hospital formulary to reduce the drug cost and ensure rational use of medicines.

## Conflict of Interests

The authors have no funding sources or conflict of interests to report.

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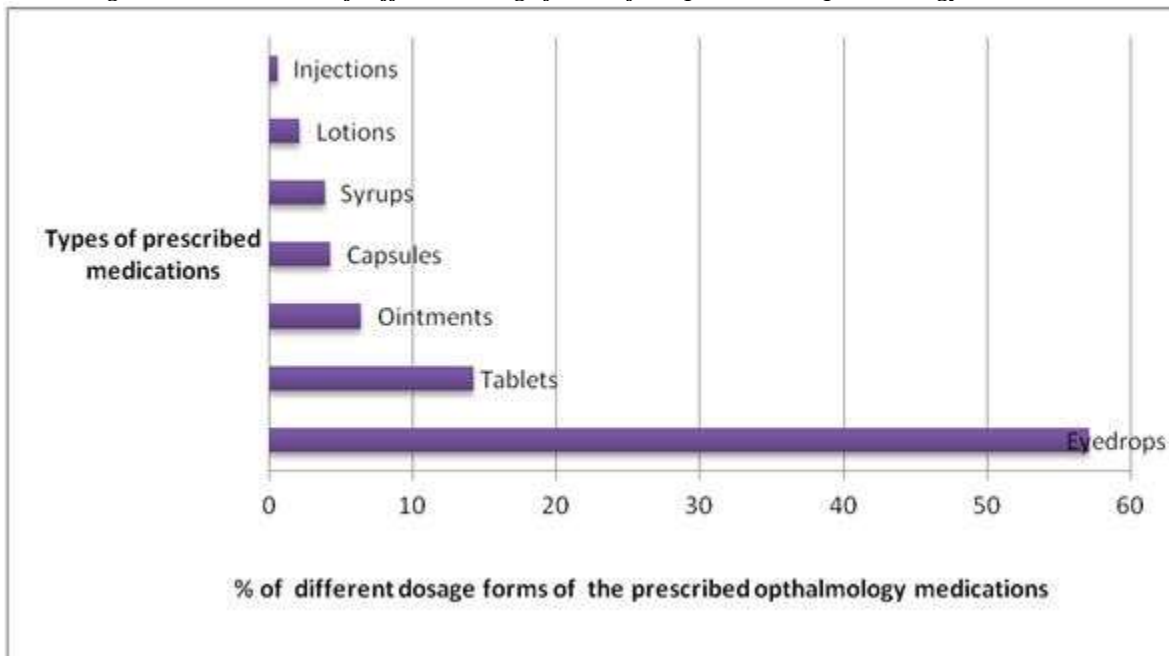
**Data Presentation of Drug Utilisation Study in Ophthalmology OPD***Table 1: Distribution of no. of drugs per prescription among all prescriptions (n=600)*

OCULAR DISEASE	NO.OF PRESCRIPTIONS (%)
REFRACTIVE ERRORS	80 (13.3)
BACTERIAL CONJUNCTIVITIS	55 (9.16)
ALLERGIC CONJUNCTIVITIS	45 (7.50)
CATARACT	42 (7.00)
GLAUCOMA	42 (7.00)
FUNGAL CORNEAL ULCER	40(6.66)
STYE	38(6.33)
BACTERIAL CORNEAL ULCER	32 (5.33)
SQUINT	28 (4.66)
FOREIGN BODY	29 (4.83)
BLEPHARITIS	26 (4.33)
SUPERFICIAL PUNCTATE KERATITIS	24(4.00)
PINGUECULA	22 (3.66)
VERNAL KERATOCONJUNCTIVITIS	21 (3.50)
CORNEAL ABRASION	17 (2.83)
CONGENITAL DACROCYSTIS	16 (2.66)
PTERIGIUM	15 (2.5)
CHRONIC DACROCYSTITIS	15 (2.5)
ANTERIOR UVEITIS	8 (1.33)
EPISCLERITIS	5 (0.83)
<b>TOTAL</b>	<b>600(100)</b>

*Table 2: Distribution of ocular diseases among 600 patients*

NUMBER OF DRUGS PER PRESCRIPTION	NO. OF PRESCRIPTION (%)
5	10 (1.66)
4	100(16.6)
3	280 (46.66)
2	180 (30.0)
1	30 (5.00)
<b>TOTAL</b>	<b>600 (100)</b>

**Figure 1: Distribution of different dosage forms of the prescribed Ophthalmology medications**



**Figure 2: Distribution of various drug categories prescribed in the Ophthalmology OPD**

