



Drug Prescription and Disease patterns in Ophthalmology Outpatients: A Tertiary Care Teaching Hospital Study

Shakthivel C.D*¹, Parekh Dhruvika Vijaybhai², Padhma. S V¹, Easuar J.L¹, Sanvika A.S¹

¹ Pharm.D, Sri Ramakrishna Institute of Paramedical Sciences - College of Pharmacy, Coimbatore, Tamilnadu, India - 641044

² Pharm.D, Parul Institute of Pharmacy and Research, Vadodara, Gujarat, India - 391110

ABSTRACT

Ophthalmology is one of the branches of medical science that is concerned specifically with anatomy, function and conditions of the eye. Most eye disorders do not show obvious warning signs or symptoms however a dilated eye examination is able to detect eye diseases at an early stage before the loss of vision occurs. The most prevalent ocular conditions include glaucoma and cataracts conjunctivitis and corneal ulcers, blepharitis refractive errors and the pterygium. This prospective observational study was designed to study the prescription pattern and the most common ocular disorders that are diagnosed in the outpatient ophthalmology department (OPD).

Participants were fully informed about the study and queries were answered prior data collection. A total of 180 prescriptions were analyzed in the ophthalmology OPD during the study period, with the number of drugs per prescription varying from 0-8. The prescription that contained only one medication was 80, two drugs were 65 and the majority of the medications that were prescribed included antibiotics (122) followed by NSAIDs (57). The study found that maximum patients diagnosed in OPD were with conjunctivitis (48), followed by dry eyes (18). The total number of prescriptions analyzed was 180. The present study provides an insight into the prescription pattern and common ocular diseases diagnosed in the ophthalmology OPD. The results indicate that early diagnosis and prompt treatment are crucial to prevent further complications and vision loss.

Keywords: Ophthalmology, drug prescription, Ocular disease, Conjunctivitis

Introduction:

Ophthalmology is an specialized area of medical science that is concerned specifically with anatomy, physiology and diseases that affect the eyes. Age-related changes in vision are common after the age of 40, and the risk of developing eye diseases increases with age. Many eye diseases don't show warning signs or symptoms in the early stages. However, a comprehensive dilated eye exam can identify these illnesses in the early stages, prior to the loss of vision. It is therefore recommended that anyone over 50 should undergo an examination. However, the incidence of ocular disorders varies across the world and is affected by factors such as race, location as well as socio-economic status and the culture. The most prevalent ocular disorders include glaucoma, conjunctivitis, corneal ulcers, cataracts, blepharitis, pterygium and refractive errors. In Ethiopia, the most prevalent eye disorders seen among patients who attend ophthalmic outreach services are cataract, conjunctivitis presbyopia, refractive error, and blepharitis. However, in Benin City (Nigeria), conjunctivitis and refractive error cataract, and glaucoma are the most common. Effective management of ocular diseases can prevent loss of vision in patients and reduce the burden of ocular health problems. Regular evaluation of drug utilization patterns can enhance therapeutic efficacy, reduce adverse effects, and assess the rationality of drug therapy. However, only a few studies have been conducted to investigate drug use patterns in ophthalmology in India. Therefore, this study aims to examine drug use in ophthalmology and evaluate its rationality based on the WHO core drug prescribing indicators.

The World Health Organization (WHO) first established research in the field of drug utilization by studying distribution, marketing and usage of medications within a community with a particular focus on the social, medical and economic effects. The primary objective of the research is to determine whether the drug therapy can be considered rational or not. To accomplish this goal, various methods for evaluating the rationality of drug treatment are vital. Regular prescription audits and regular feedback to doctors can enhance their efficiency and improve the efficacy and safety of the treatment offered. The studies on drug utilization provides a pharmacoeconomic foundation to make evidence based healthcare decisions. In ophthalmology practice, the use of rational drugs is crucial in reducing the burden of ocular diseases.

To improve the effectiveness and safety of the treatment, it's essential to examine the patterns of drug utilization and examine the rationality behind drug prescription. In India, there have been only a limited studies that examined the patterns of drug use in ophthalmology. The widespread usage of topical antibiotics and NSAIDs in an effort to enhance therapeutic efficacy, delay resistance, and minimize adverse drug events must be periodically assessed for any structural or histological changes to the conjunctiva. Therefore, this study is designed to examine the drug utilization and prescribing patterns in Ophthalmology. The rational use of drugs in ophthalmology practice is vital in reducing the burden of ocular diseases in the country. Although most previous studies considered WHO-recommended prescribing indicators, only one study provided information on the type of ocular disorder affecting the patients.

OBJECTIVES:

PRIMARY OBJECTIVES

To examine the patterns of prescription of drugs and the occurrence of disease in patients who attend the ophthalmology department at a Tertiary Hospital, Coimbatore.

SECONDARY OBJECTIVES

To evaluate the percentage of prescribed drugs that are listed on the Essential Medicine List (EML)

STUDY CRITERIA

Inclusion requirements:

The study included all patients who attended the ophthalmology department of the hospital and provided written informed consent to participate.

Exclusion requirements:

Patients who were unwilling to be part of the study were not included.

METHODOLOGY

We conducted a prospective observational study that was approved from the Institutional Ethical Committee in the Hospital for the course of six months from July 2022 to January 2023. Participants who met the inclusion or exclusion criteria were admitted after receiving written consent from the individual. We employed a specially-designed data collection form to collect all necessary information. The participants were given an in-depth outline of the research prior to the collection of data began. The collected data was later transferred to an Excel spreadsheet to be analyzed. We employed appropriate statistical techniques to analyze data and SPSS V.22 to perform statistical analyses. Descriptive statistical techniques such as frequency, mean, mode and median were employed to study the socio-demographic information.

RESULTS:**1. Social-demographic characteristics of participants in outpatients for ophthalmic conditions. (N= 180)**

The total number of prescriptions were examined and the results showed that the mean age of the participants of the study was 39.31 years (SD-29.90). Of the 180 prescriptions, 56% were male and 44 % were female. The distribution of age revealed that 40 patients were between 1-20 years old, 57 patients were between 21-40 years old, 54 patients were between 41-60 years old, and 29 patients were aged above 60 years.

Table 1: Socio-demographic characteristics of participants in Ophthalmic Outpatients

Age group	Number of Participants	Percentage (%)
1-20	40	22
21-40	57	32
41-60	54	30
61>	29	16
Sex		
Male	100	56
Female	80	44

Mean age 39.31 SD +- 29.90 (N= 180)

2. No. of prescribed drugs according to prescriptions issued by Ophthalmic Outpatients.

An total of 180 prescriptions were examined and the number of prescriptions per patient ranging between 0 and 8. It was observed that 12 prescriptions were not filled with any drugs prescribed. When analyzing the other prescriptions, it found that 77.7% included 1-2 drugs, 13.8% contained 3-4 drugs while only 1.1% had 5-6 drugs.

Table 2: No. of drugs prescribed per prescription from Ophthalmic Outpatients.

NUMBER OF DRUGS PER PRESCRIPTION	NUMBER OF PRESCRIPTIONS	NUMBER OF PRESCRIPTION (%)
.00	12	6.6
1-2	140	77.7

3-4	25	13.8
5-6	2	1.1
7-8	1	0.55

3. No. of dosage forms that are prescribed by prescription for Ophthalmic Outpatients.

A total of 180 prescriptions were issued, in that 168 of them were prescribed with different dosage forms. The maximum amount of dosage forms prescribed for each prescription was 3 and the minimum is 1. The study revealed that single dosage form of the drug was prescribed to 63.69% of patients. while, two dosage forms of the drug are prescribed for 30.35% of prescriptions. Furthermore, three dosage forms of the drugs are prescribed for 5.95% of prescriptions.

Table 3: No. of dosage forms that are prescribed in accordance with the prescription for Ophthalmic Outpatients.

NO OF DOSAGE FORMS PRESCRIBED PERPRESCRIPTIONS	NO. OF PRESCRIPTIONS	PERCENT (%)
1	107	63.69
2	51	30.35
3	10	5.95
Total	168	100

4. Distribution of disease:

According to the statistical analysis, among the 180 prescriptions analyzed, 26.6% of patients were diagnosed with conjunctivitis, 10% were diagnosed with dry eyes, and 9.4% were diagnosed with refractive errors.

Table 4: The Distribution Of Diseases

Ocular Diseases	No. Of Prescriptions	Percent (%)
Conjunctivitis	48	26.6
Dry Eyes	18	10
Refractive Errors	17	9.4

Allergy	15	8.3
Pterygium	14	7.7
Blepharitis	9	5
Episcleritis	5	2.7
Infection	5	2.7
Corneal Ulcer	4	2.2
Trauma	4	2.2
Physical Injury	4	2.2
Insect Bite	4	2.2
Trauma With Mild Conjestion	3	1.6
Internal Hardluem+Orbital Celulitis	3	1.6
Lacrimal Duct Distoriation	3	1.6
Glucoma	2	1.1
Macular Edema	2	1.1
Diabetic Retinopathy	2	1.1
Grade 2 Hyperactive Retinopathy	2	1.1
Chemical Injury	2	1.1
Myopic Fundus	1	0.6
Nadacranial Dust Distoriation	1	0.6
Papilloma Of Caruncle	1	0.6
Age Related Macular Degeneration	1	0.6
Bell's Palsy And Logophthalmar	1	0.6
Cataract	1	0.6
Chalazion	1	0.6
Corneal Sensation With Cyst	1	0.6
Keratitis With	1	0.6

Staphyloma		
Left Eye External	1	0.6
Hardeleoum		
Meibomitis	1	0.6
Forign Body Sensation	1	0.6
Pseudophil Eyes	1	0.6
Re Internal Hardeluem	1	0.6
Total	180	100.0

5. Different classes of medications prescribed to the outpatients of ophthalmology

The study examined the 180 prescriptions and found that antibiotics were the most commonly prescribed drug with 41.49% in all prescriptions. These were followed by NSAIDs (19.38%) artificial tears (21.08%) and anti-inflammatory medications (6.15%) and antihistamines (2.72%) and Cycloplegics (5.44%) Vitamins (3.06%) and anti-glaucoma medicines (0.68%).

TABLE 5: Classes of medications prescribed in outpatients of ophthalmology

CLASS OF A DRUG	NO. OF DRUGS	PERCENT (%)
Antibiotics	122	41.49%
Anti-inflammatory	18	6.15%
Cycloplegics	16	5.44%
Anti-glaucoma	2	0.68%
Antihistamines	8	2.72%
NSAID's	57	19.38%
Vitamins	9	3.06%
Artificial tears	62	21.08%
TOTAL	294	100%

6. Drug core indicators:

Total no. of prescriptions	180
Average no. of drugs per prescription	1.78
Total no. of drug prescribed	294
No. of antibiotics prescribed	122
No. of drugs from WHO EML	78
No. of injection prescribed	00

DISCUSSION:

The study was conducted within the Ophthalmology Department of a Tertiary Hospital, Coimbatore. There were 180 outpatients who fulfilled the study's criteria were taken part in the study. The study examined the 180 prescriptions issued by the OPD department of ophthalmology, which showed most of the patients are male (56%) and the rest women (44%).

The average amount of prescribed drugs per prescription is an important indicator that determines the amount of polypharmacy. Our study found that the quantity of prescription drugs varied between 0 - 8, with prescriptions containing one drug at 80, two drugs at 65, four drugs at 7, and one prescription each containing five, six, and eight drugs. The average number of prescribed drugs in a prescription was 1.78. This is comparable to the study carried out in the study of Neelkant Reddy Patil and co. in which the average number of drugs per prescription was determined to be 2.

A lesser number of medications per prescription means fewer possibilities of interaction between drugs, less risks of adverse drug reactions, higher compliance and higher chances of a correct diagnosis. The average amount of drugs prescribed must be kept at a low count to minimize adverse reactions as well as bacterial resistance levels and cost-of-care for patients. The amount of polypharmacy as evident in the amount of prescriptions in the range of 1.6 to 1.8%. Prescription errors must be reduced by ensuring an appropriate prescribing schedule and the proper usage of medications, which can increase the benefits for patients in a various aspects and improve public health.

The study examined the patterns of prescriptions for drugs and discovered that antibiotics were among the most frequently prescribed medication (122) which was then NSAIDs (57), anti-inflammatory drugs (18), Cycloplegics (16), antihistamines (8) as well a vitamins (9) and anti-glaucoma medications (2). Artificial tears have been prescribed at 62 times. Our findings were similar with the study done by Rajesh Kumar Suman and co. in which

they found that antibiotics (14.69%) as well as antiviral medicines (4.12%) and antihistamines (49.14%) and steroids (11.98%) and anti-inflammatory medications (6.04%) comprised the majority of frequently prescribed medications, while artificial tears have been prescribed to patients in 22.23% of cases.

The eye drops are the frequently prescribed dosage for treatment of ophthalmology which included all dosage groups, such as steroids, antibiotics artificial tears, anti-glaucoma medications. Vitamins and NSAIDs were mostly prescribed as tablets as well as antibiotics, whereas steroids were prescribed in gel or ointment form. Vitamins were prescribed in tablet or capsule form. In the end, the proper use of drugs and appropriate pattern of prescribing drugs will improve patient outcomes as well as public health.

CONCLUSION:

The study examined the Ophthalmology Outpatient Department (OPD) of a Tertiary Hospital located in Coimbatore to determine the prescription pattern and the adherence to the essential requirements. Most of the patients who participated were male (56%) and the average amount of prescriptions for each prescription is 1.78 which indicates a low level of polypharmacy. The most frequently prescribed dosage form was eye drops (204) then tablets (63) followed by eye Ointments (26), capsules (3) as well as syrup (1) and Shampoo (1).

Conjunctivitis was the most frequent diagnosis of the 48 patients who were diagnosed with dry eye (18) and allergic (15), Pterygium (14) and Blepharitis (9). The antibiotics (122) was the most frequently prescribed medication and were following by NSAIDs (57), anti-inflammatory (18), the cycloplegics (16), antihistamines (8), vitamins (9) and anti-glaucoma medicines (2). The most important requirements for prescription writing, like the route of administration, the duration of treatment, and the frequency of administration were found in majority of the prescriptions reviewed.

Additionally 25% of the medications prescribed were listed on that of the WHO Essential Medicines List (WHOEML). The prescription pattern used of this study was conformity with the accepted treatments for eye diseases and prescription errors were insignificant. There is however the potential for improvement in encouraging the use of generic names as well as selecting essential medications that are listed in the WHOEML, National Essential Drugs List (NEDL) as well as the National Formulary of India (NFI). In the end, the study emphasizes the importance of adhering to the essential requirements and the necessity of continuing efforts to improve the prescription patterns for ophthalmology OPD.

IMPLICATIONS

The study has a variety of implications for managing eye diseases in outpatient environments.

First, the study demonstrated that the pattern of prescribing of ophthalmologists was based on information and in accordance with established treatment guidelines for ocular disorders. This suggests that doctors in the teaching tertiary care hospital are aware of the right prescriptions for various eye conditions.

Second, the study showed that polypharmacy was not as prevalent and had the average being 1.78 prescriptions for each drug. This is crucial since polypharmacy may increase the chance of developing adverse drug reactions as well as drug interactions, especially among patients who have multiple concurrent disorders.

Third, the study revealed that the majority of prescriptions had crucial requirements of the dosage route, duration of treatment, as well as frequency of the administration. This is significant since adherence to these requirements will improve the effectiveness of treatment and decrease the chance of errors in medication.

Fourth, the study revealed that antibiotics were the most frequently prescribed drug and were followed by NSAIDs, anti-inflammatory medications as well as cycloplegics. This suggests the need for antimicrobial-stewardship strategies to maximize the use of antibiotics for the treatment of eye diseases.

Finally, the study highlighted the importance of prescribing drugs by their generic names and selecting essential drugs from WHO EML/NEDL/NFI. This study suggests it is necessary for education interventions to promote using generic medications and to select essential drugs from standard lists to enhance the effectiveness and quality of treatment for ocular conditions in outpatient settings.

ABBREVIATIONS:

WHO EML - World Health Organization Essential Medicine List

NSAID - Non Steroidal Anti Inflammatory Drugs.

ADE - Adverse Drug Event

ADR - Adverse Drug Reaction

NEDL - National Essential Diagnostic List

NFI - National Foundation for India

REFERENCE:

1. Neelkant Reddy Patil, Shetty Sai Shishir, Sankeerthana. A, Rammya Sajjan, Sri Sai Kasyap.Ch. A Study On Drug Utilization Among Ambulatory Patients Visiting Department Of Ophthalmology At A Tertiary Care Hospital International Journal Of Pharmacy And Pharmacuetical Research August 2019 Vol.:16, Issue:1.

2. Ali Ab. Pattern of Eye Diseases at Tertiary Eye Hospital in Sudan (Makah Eye Hospital, Khartoum). Al-Basar International Journal of Ophthalmology. 2015 Jan 1;3(1):15.
3. Rawah Ma, Alkhayri Mm, Alomari Ma, Almalki Rk, Alyahya Fh, Alotaibi Fa, Meriky Lh, Alawami Ss, Alomari Ma, Jan Rm, Banjar Am. Drug Prescription In Ophthalmology. The Egyptian Journal of Hospital Medicine. 2017 Oct 1;69(7):2856-9.
4. Prajapati V, Yadav Ak. Drug Use In Ophthalmology Out-Patient Department: A Prospective Study At A Tertiary Care Teaching Hospital. Indian Journal Of Pharmacy Practice. 2012;5(2).
5. Rathnakar Up, Kamath A, Gupta K, Gupta A, Naushad Sg, Kotekar Mf, Shenoy V. A Descriptive Study Of Drug Utilization In Outpatients Of Ophthalmology Department Of A University Teaching Hospital In Southern India. Journal Of Clinical And Biomedical Sciences. 2014 Dec 31;4(4):346-8.
6. Banerjee I, Bhadury T, Sengupta T, Roy D. Drug Utilization Study In Ophthalmology Outpatient Department Of A Medical College In India. Annals Of Medical And Health Sciences Research. 2014;4(4):667-70.
7. Slathia A, Gupta V, Nanda R, Mahajan P. Drug Utilization Pattern In Ophthalmology: A Observational And Cross-Sectional Study. International Journal Of Scientific Study. 2017 Aug 1;5(5):63-5.
8. Dhali D, Halder U, Santra R, Biswas M. Drug Utilization Study In Outpatient Ophthalmology Department Of A Tertiary Care Hospital In West Bengal. In Indian Journal Of Pharmacology 2014 Dec 1 (Vol. 46, Pp. S55-S56).
9. Suman Rk, Gore Vs, Mohanty Ir, Israni N, Deshmukh Ya. Drug Utilization Patterns Of Drugs Used In Ophthalmology Out-Patients Department At Tertiary Care Hospital.
10. World Health Organization. World Health Organization Model List Of Essential Medicines: 21st List 2019. World Health Organization; 2019.

