Polypharmacy in ophthalmology; a pattern of drug prescription by ophthalmologist.

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Piya Muhammad Musammat Rafi [1], Majid Hussain[2], Sarfraz Ahmad Mukhtar[3], Muhammad Jahanzaib Khan[4], Shehzad Manzoor[5], Rao Muhammad Tariq Aslam[6].
Institute of Ophthalmology and Allied Vision Sciences Multan[1,6]
Nishtar Medical University and Hospital Multan[2]
Quaid e Azam Medical College/BHV Bahawalpur[3,4,5]

ABSTRACT

Purpose: The aim of the present study was to analyze the prescribing pattern of drugs by Ophthalmologist in our settings for various ocular conditions. As Recognition of these drug usage patterns provides the basis for improving safety and plummeting risks associated with their overuse and misuse.

Methodology: For this Descriptive Cross-sectional study, data of 200 patients at ophthalmology outpatient department Nishtar Hospital Multan was collected Prospectively. Strategy of non-probability purposive sampling was adopted. Data was collected from December 2024 to February 2025. Demographic profile, nature of the disease, type/class of Topical drugs prescribed as well as quantity of topical drugs were documented and analyzed.

Result: Among the participants, 99 (49.5%) were male and 101 (50.5%) were female patients. 47 (23.5%) patients were between 61-75 years of age and 51 (25.5%) were above 75 years of age. Large number of patients (50, 25%) were undiagnosed. Mean number of drugs prescribed per prescription were 3.28. Among the total prescribed drugs Ocular lubricants were 22.9%, Antibiotics plus steroids combination 91 (13.9 %) and Antibiotics were 80(12.2%). Topical NSAIDs were prescribed 108 (16.5%) and steroid 54 (8.3%). Share of Antihistamine and Mast cell stabilizer was (9.6%).

Conclusion: Overall findings of the study suggest that ophthalmologists' drug prescribing habits were appropriate to a larger extent in the current setting. Few areas need special attention like number of drugs prescribed, indications of particular drug for a particular disease, proper diagnosis of clinical presentations.

Keywords: Drug prescription. WHO. Antimicrobial resistance. Polypharmacy. Topical Drugs. Ocular Diagnosis. Rational drug use.

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Correspondence: Pia Muhammad Musammat Rafi,
Assistant Professor of Ophthalmology,
Institute of Ophthalmology & Allied Vision Sciences, Multan.
Email: drmusammat@gmail.com

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INTRODUCTION

Drug utilization studies in Ophthalmology has gained importance in recent era due to increase in inappropriate drug prescription through lack of diagnosis, irrational and Multi-drugs prescribing attitudes, and failure to educate patient about his illness. Hence, to promote rational prescriptions of drugs, a periodic auditing of drug utilization pattern has become indispensable. Drug use indicators as laid down by WHO are becoming increasingly necessary in developing countries to promote appropriate drug use. Drug utilization research according to WHO is; Marketing, Distribution, Prescription, and drug use in the community.[1] Research should focus on resulting medical, social, and economic consequences. The efficacy and safety of medicine utilized depend upon proper education by the physician, a rational prescription and proper comprehension of the information provided to the patient.

Auditing the drug prescribing pattern, we can clearly lay down the recommendations, focus on our necessities and priorities. Knowledge of prescribing pattern is also important for allocation of budget for the purchase of eye drops and to maintain inventory level of each eye drop to overcome the problems of unavailability and shortage of essential eye medicines.[2] Drug utilization studies are also very important in regards of emerging antimicrobial resistance in Ophthalmology. Irrational prescription and use of antimicrobial agents (AMAs) steering the antimicrobial resistance in community. Creating awareness regarding selection of drugs to reduce the drug cost and drug related morbidity is the need of the hour. Updating knowledge regarding appropriate antimicrobial use and the development of discreet strategies for their use are of paramount importance. Treating physician should be aware of most common prescribed AMAs and their consequences on ocular health. Misuse of antibiotics is leading towards antibiotics resistance causing decreasing efficacy of treatment, increasing morbidity, increasing burden on public health sectors with compromised quality of patient life and vision.[3,4,5] Another consequence of irrational medicine prescription is practice of self-medication (SM). Such practices can cause some severe complications and irreversible blindness. Many time reasons for self-medication can be traced back to irrational prescription by some treating physician. Without proper education about their diseases, people start to take medication over the counter by themselves.[6,7]

Irrational drug prescription pattern is common in developing worlds and is not in line with the recommended standard values of WHO prescribing indicators.[8] Our study was intended to obtain knowledge on the prescribing pattern and drug utilization trend in ophthalmology department at a tertiary care teaching hospital with ultimate goal to promote rational use of drugs among prescribers.

METHODOLOGY

For this Descriptive Cross-sectional study, data was collected Prospectively. Record of All patients those present in ophthalmology outpatient department, Nishtar Hospital Multan and fulfill the inclusion criteria were included in the study. Strategy of non-probability purposive sampling was adopted. Data was collected Prospectively from December 2024 to February 2025. Drugs prescription Pattern was documented and analyzed by consultant ophthalmologist. SPS was used for data analysis and 200 patients were included in the study. Data was collected irrespective of disease and prescribing ophthalmologist. Only topical medicine included in the study. Patients of all age groups and gender were included in study. Demographic profile, nature of the disease, type/class of drugs prescribed as well as quantity of drugs were documented and analyzed. All the new cases with drug prescription were included in the study and patients with follow-up excluded. Topical Drugs classes/types included were Antibiotics, Antibiotics plus Steroid combination, Anti-Allergy (Anti-Histamine and mast cell stabilizers), Ocular Lubricants/artificial tears, Anti-Glaucoma, Steroids, Topical NSAIDs (e,g Nepafenac acid), Anti-Fungal and Anti-viral. Depending upon their

frequent appearances in patients prescriptions, Diseases broadly categorized as Ocular allergies, Corneal ulcer, Intraocular inflammation, Glaucoma, Dry eye, Retinal disease (e,g diabetic retinopathy, age related macular degeneration, retinal vasculopathy and detachment) and Undiagnosed cases.

ANALYSIS

Among 200 patients, 99 (49.5%) were male and 101 (50.5%) were female patients. 41 patients (20.5%) were between 0-15 years old while 25 (12.5%) were 46-60 years old. 47 (23.5%) patients were between 61-75 years of age and 51 (25.5%) were above 75 years of age. See Bar chart for patients age

Large number of patients (50, 25%) were undiagnosed. Corneal ulcer was diagnosed in 34(17%) while Ocular allergies and Retinal diseases were diagnosed in 29 (14.5%) each. Dry eye was diagnosed in 21(10.5%) and glaucoma in 17 (8.5%). See table 1 and Bar graph. Mean number of drugs prescribed per prescription were 3.28, with minimum 1 and maximum 6 drugs. 42.5 % prescriptions were containing 3 drugs while 26.5% prescription were containing 4 drugs. Only 2.5% (5) prescriptions were having one drug prescribed.

Table 1

A total of 654 medicines were prescribed. Among the total prescribed drugs Ocular lubricants were 22.9%, Antibiotics plus steroids combination 91 (13.9 %) and Antibiotics were 80(12.2%). Topical NSAIDs were prescribed 108 (16.5%) and steroid 54 (8.3%). Share of Antihistamine and Mast cell stabilizer was (9.6%). Anti-Glaucoma medicine were given 7.2% time while Anti-fungal/Anti-Viral were 4.7%/4.6% among total prescribed drugs.

Further on crosstabulation it emerged that in dry eye patients, all patients were given Lubricants drops (100%) and Antibiotics plus Steroid combination was also given (90.5%). For corneal ulcer patients; all patients were given Antibiotics drops along with ocular lubricants (91.2%), Anti-Fungal (91.2%) and Anti-Viral (85.3%). 100% glaucoma prescriptions contain anti-glaucoma medication along with Ocular lubricants (94.1%). Prescriptions labelled Ocular allergy contain 93.1% Anti-Histamine and Mast cell stabilizers, 89.7% ocular lubricants and Antibiotics plus Steroid combination 79.3%. All patients with Intraocular inflammation were given Antibiotics, Steroids and topical NSAIDs. All Patients with Retinal diseases were given topical NSAIDs along with Antibiotics plus Steroid combination 55.2%, and Ocular lubricants 62.1%. Majority of the patients with undetermined disease were given Ocular lubricants (76%) and topical NSAIDs (66%).

Table 2

Analyzing certain clinical diseases with respect of certain age groups, it is found that the relationship is significant with Chi-square p value .000. There was no significant relationship between patient diseases and patient gender (p - 174).

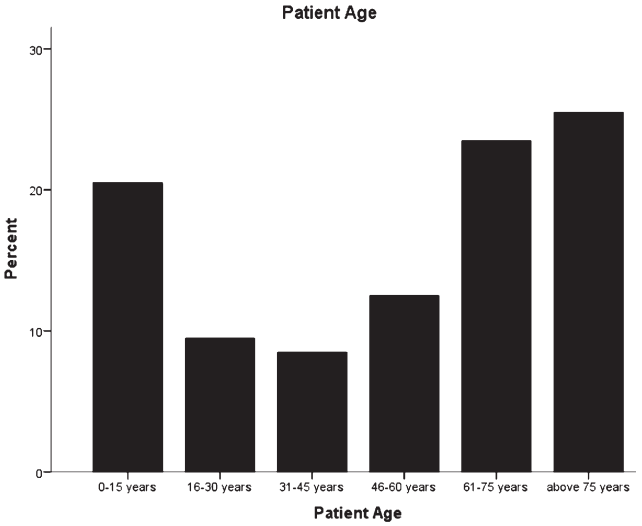

Table 1:

CLINICAL DISEASES	Frequency (patients)	Percent (patients)	NUMBER OF DRUGS PRESCRIBED	Frequency (patients)	Percent (patients)
Dry eye	21	10.5	1	5	2.5
Corneal ulcer	34	17.0	2	35	17.5
Glaucoma	17	8.5	3	85	42.5
Ocular allergies	29	14.5	4	53	26.5
Intraocular-inflammation	20	10.0	5	16	8.0
Retinal disease	29	14.5	6	5	2.5
Undiagnosed	50	25.0	Minimum	1	
			Maximum	6	

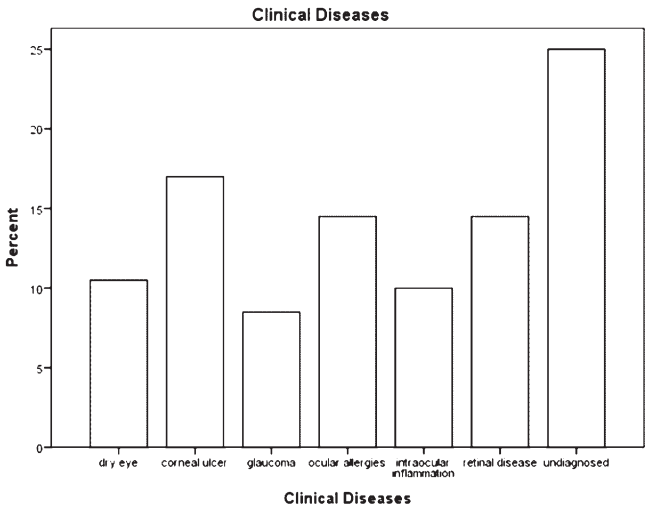

Table 2. Crosstabulation: Drugs prescription for particular diseases

% of Prescriptions Containing Prescribed Drug for Individual Disease				
CLINICAL DISEASES	Antibiotics	Antibiotics plus Steroid combination	Anti-Histamine	Ocular Lubricants
Dry eye	0.0	90.5	71.4	100.0
Corneal ulcer	100.0	0.0	0.0	91.2
Glaucoma	0.0	58.8	47.1	94.1
Ocular Allergies	10.3	79.3	93.1	89.7
Intraocular inflammation	100.0	0.0	10.0	0.0
Retinal diseases	0.0	55.2	0.0	62.1
Undiagnosed	46.0	46.0	22.0	76.0

DISCUSSION

One of the critical components of patient treatment is the proper utilization of drugs. It not only reduces possible drug resistance and economic burden to the individual and nation but also adverse effects to the eye. Irrational use of drug emphasizes the need for periodic review and educational interventions in prescribing practices. Current study is an attempt to focus light on drugs prescribing pattern by our ophthalmologist and this study also indicates shortcomings in diagnosing and possible over prescription of certain drugs groups. In our study female patients were slightly outnumbered than male patients. More patients at the both ends of age range attend the OPD than middle age ranges; patients with age range 31-45 years were lowest (8.5%). On average 3.28 drugs were prescribed per prescription, with minimum 1 and maximum 6 drugs. This average number of drugs per encounter is little bit higher than WHO Standard (1.6-1.8).[9] Thus, this is a form of polypharmacy. The number of medications per prescription should be kept as low as possible in order to minimize the risk of medication interactions, increased bacterial resistances, treatment cost and adverse effects.[12]

It is also of worth noticing that 25% prescription were without diagnosis. Clinical impression for the patient presentation was not mentioned in the patient prescription. This behavioral pattern should be discouraged by at all levels of management. In our study overall, most common medicines prescribed were Ocular lubricants 22.9%, second were topical NSAIDs 16.5% and Antibiotics plus Steroids combinations 13.9%. We think that this trend of drugs prescription is rational in our settings, where particular problems are more prevalent. Other researcher; Ahluwalia PS, Janaki DCH et al, have found inconsistent trend in types of drugs prescription depending upon the disease presentation in their regions.[10,11] Some diseases are more prevalent in particular regions so drugs are prescribed accordingly. Ocular lubricants are frequently prescribed topical medicine. They are prescribed to compensate deficient natural ocular tears when their quality and quantity is compromised. 100% prescriptions for dry eye contains ocular lubricants while 91.2% prescriptions for corneal ulcer 94.1% for glaucoma and 89.7% for ocular allergies contain lubricants.

For Corneal ulcer patients, every patient was prescribed Antibiotics along with Anti-Fungal (91.2%) and Anti-Viral (85.3%) medicine. 46% medicine volume of Undiagnosed cases was antibiotics and for Intra-ocular inflammation every prescription was containing Antibiotics. This is the scenario we must be focusing on. Drugs must be prescribed according to best clinical judgment for infective organism, and confirmed after culture and sensivity. This Irrational Antibiotics use and polypharmacy leads to antibiotic resistance and serious consequences in the form of vision loss. In ophthalmology fluroquinolone antibiotics are most commonly used and emerging resistance against

them is a concern for researchers.[13,14,15]

58.8% prescriptions for Glaucoma contain Antibiotics plus Steroid combinations. Glaucoma is a blinding disease. Steroid are some time very hazardous to prescribe in these patients. Different combinations of anti-glaucoma drugs can be tried rather than to give them steroids for some ocular adverse effects of anti-glaucoma drugs.[16,17] Another important observation is prescribing pattern for Topical NSAIDs. Every patient with Intraocular inflammation and Retinal diseases was prescribed with topical NSAIDs while Undiagnosed cases were also prescribed (66.0%). Previously study by Prathap SA et al shows Topical Analgesics prescription rate 46.2%.18 Our concern in this case is Undiagnosed cases, where large numbers are prescribed with topical NSAIDs. As the indications for recommending Topical NSAIDs are very clear, there is no need to prescribe them without any rationale. This is un-necessary burden on the patient and deflect him/her away from true diagnosis and treatment of their ailments.[19,20] Ocular morbidity of polypharmacy is a well-known fact among ophthalmologist. This study reflects the scope for improvement in prescribing pattern, disease diagnosis, indications and contraindications of particular drug.

CONCLUSION: This study reflects knowledge, attitude and practice of our ophthalmologists regarding ocular drugs prescription. Our study can prove as a tool for assessing the prescribing, dispensing, and diagnosing behavior of our ophthalmologist. The main aim of Drug Utilization Study is to facilitate rational use of medicines. Overall findings of the study suggest that ophthalmologists' drug prescribing habits were appropriate to a larger extent in the current setting. Few areas need special attention like number of drugs prescribed, indications of particular drug for a particular disease, proper diagnosis of clinical presentations.

Conflict Of Interest: None to declare

Ethical Approval: The study was approved by the Institutional Review Board / Ethical Review Board vide ref No. 1536/NMU dated 31.01.2025 Nishtar Medical University Multan.

Authors' Contributions:

Piya Muhammad Musammat Rafi: Concept Design, Literature Research, Data acquisition, Data Analysis, Statistical analysis, Manuscript preparation, Manuscript editing, Manuscript review.

Majid Hussain: Concept Design, Data acquisition, Data Analysis, Statistical analysis, Manuscript editing.

Sarfraz Ahmad Mukhtar: Literature Research, Manuscript preparation, Manuscript editing, Manuscript review.

Muhammad Jahanzaib Khan: Concept Design, Data acquisition, Manuscript review.

Shehzad Manzoor: Literature Research, Data Analysis, Data Analysis, Manuscript review.

Rao Muhammad Tariq Aslam: Concept Design, Manuscript preparation, Manuscript editing, Manuscript review.

REFERENCES:

1. Mohammed S, Thomas AM, Joy A, Abraham AA, Sravya D, Hiremath D. Drug Utilization Study in Ophthalmology Outpatient Department of a Tertiary Care Teaching Hospital. Ind J Pharm Pr. 2021; 14(3): DOI: 10.5530/ijopp.14.3.33

2. Sadiq M, Jabeen S, Shaheen Z. Drug utilization study of eye drops at tertiary care teaching eye hospital. Al-Shifa J Ophthalmol. 2015;11(2):67-75.

3. Patel DR, Patel PP, Bhagat PR, Gandhi AM, Desai MK. An analysis of the use of antimicrobial agents in outdoor patients of ophthalmology. J Family Med Prim Care. 2019; 8(8): 2676–2680. Doi: 10.4103/jfmpc .jfmpc_436_19. PMCID: PMC6753830

4. Kauser H, Chopra D, Mukherjee S, Mohan P. Pharmacoepidemiological Observational Study of Antimicrobial Use in Outpatients of Ophthalmology Department in North Indian Population. J Pharm Bioallied Sci. 2018; 10(2):

72–76. doi: 10.4103/JPBS.JPBS_ 255_17 PMCID: PMC5998702

5. Siddiqa F, Ebad SM. How to Encounter Emerging Situation of Antibiotics Resistance among General Population of Pakistan. Pak J Med Res. 2023;62(4):186-7.

6. Nazneen Z, Batool A, Siddiqi A, Ali S. Practice of Self-Medication among Medical and Non-Medical Undergraduate Level University Students in District Abbottabad. Med Forum 2021; 32(11):50-54.

7. Samiuddin, Khan MT, Fatima B, Haris A, Sapna, Uddin N, et al. Traditional and Self-Medication Practice for Common Eye Ailments. JCCO [Internet]. 2023;1(01):28-34. DOI: https://doi.org/10.71177/jcco. v1i01.9

8. Ofei-Palm CNK, Tagoe NN, Jatoe D, Agyare A, Suubam F, Ankrah D. Drug Utilization Study in Ophthalmology Outpatient Department of a Tertiary Care Hospital in West Africa. JPST. 2021; 5 (2) : 4 4 - 9 . https://doi.org/10.11648/j.pst.20210502.13

9. Shrestha U, Shakya Shrestha S, Shrestha A, Poudel U, Manandhar Shrestha JT. Drug Utilization Study in Outpatient Department of Ophthalmology in Tertiary Care Hospital. Kathmandu Univ Med J. 2022;77(1):43-6. PMID: 36273289.

10. Ahluwalia, P. S., Baig, M. S., Awargaonkar, A., & Nandedkar, V. (2021). Drug utilization study in ophthalmology department at a tertiary care hospital. IJBCP. 2021; 10(4): 396–402. https://doi.org/10.18203/2319-2003.ijbcp20211022

11. Janaki DCH, Seethalakshmi S, Devaraj S. Drug utilization study in ophthalmology out patients in a tertiary care teaching hospital. Int J Basic Clin Pharmacol. 2020; 9:1721-4. https://doi.org/10.18203/2319-2003.ijbcp 20204501

12. Arshad AR, Ijaz F, Siddiqui MS, Khalid S, Fatima A, Aftab RK. COVID-19 pandemic and antimicrobial resistance in developing countries. Discoveries. 2021; 9(2):e127. doi: 10.15190/d.2021.6. PMID: 34754900; PMCID: PMC8570918.

13. Wozniak, R. A. F., & Aquavella, J. V. (2017). Antibiotics in ophthalmology practice. Expert Rev. Ophthalmol. 2017; 12(3): 243–250. https://doi.org/10.1080/17469899.2017.1318065

14. Santra R, Dutta J, Bhadury A, Barua N, Maji A, Maji S. Assessment of Antimicrobial Prescribing in Ophthalmology Outpatient Department of a Tertiary Care Hospital. IJPHRD. 2023;14(3). https://doi.org/10. 37506/ijphrd.v14i3.19388

15. Arshaad A, Sharafat S, Mustafa A, Mahmood H, Mustafa F, Tariq S, et al. Drug utilization review of fluoroquinolones among the out-patients in a public sector hospital, pakistan. IJPIHS. 2023; 4(1): https://doi.org/ 10.56536/ijpihs.v4i1.54

16. Sadiq M, Jabeen S, Mahsood YJ, Akhtar F. Pharmacological Aspects and Utilization of Topical Antiglaucoma Drugs. Al-Shifa J Ophthalmol. 2018;14(1):34-43.

17. Bhatt J. H., Verma S., Bagde S., Sane R. M., Shahani S. Drug utilization study in ophthalmology in OPD patients at a tertiary care teaching hospital. IJBCP. 2018; 7(2): 315–318. https://doi.org/10.18203/2319-2003.ijbcp20180105.

18. Prathap SA, Radhika MS, Rai RK. Prescribing pattern of ophthalmological\ medication in geriatric inpatients of a tertiary care hospital. Int J Basic Clin Pharmacol. 2019;8(5):940-4. https://doi.org/10. 18203/2319-2003.ijbcp20191580

19. Priyanki, Kumari K, Gari M, Pathak AK. A study of the current prescribing and drug utilization pattern in Ophthalmology Department of a tertiary care teaching hospital. Int J Basic Clin Pharmacol. 2019; 8:497-501. https://doi.org/10.18203/2319-2003.ijbcp20190654

20. Nishandar TB, Kale AS, Pise HN, Jambhrunkar SD. Drug utilization study in ophthalmology outpatient department in a government tertiary care hospital in Maharashtra. Asian J Pharm Clin Res. 2018; 11(7): 267-70. DOI:10.22159/ajpcr. 2018. v11i7.25995