



## DRUG UTILIZATION STUDY OF POSTOPERATIVE CASES OF CATARACT IN OPHTHALMOLOGY DEPARTMENT AT TERTIARY CARE HOSPITAL

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### ABSTRACT

**Background:** There are many studies carried out in India on outpatient department of ophthalmology. Very few studies are available on postoperative care. Hence present study was undertaken for analysing and study the prescription patterns and review the role of various drugs prescribed to postoperative cataract patients in order to improve patient's compliance.

**Aims and objectives:** To study prescription pattern of drugs in postoperative cataract patients using WHO core prescribing indicators.

**Materials and methods:** This is a prospective, observational study was carried out in department of pharmacology in association with ophthalmology at tertiary care hospital G.M.C.H. Aurangabad after approval from Institutional Ethics Committee. Data obtained from case records forms, includes patients' demographic details and drugs prescribed.

**Results:** Total of 150 prescriptions analyzed over a period of 18 months from Jan-2020 to June 2021. The majority of cataract patients belong to the age group of 40- 65 years. Average no. of drugs prescribed were 3.8. Usual prescription was one antibiotics either alone or in combination with steroids, one proton pump inhibitors, one analgesic agent. Some of them are having Mydriatic agent and Lubricating agent too. Eye drop Gatifloxacin + Prednisolone FDC is given to all patients. Percentage of drugs prescribed by generic name was 91.71%.

**Conclusions:** This study is a step forward in the broader assessment of safety and efficacy of prescription of drugs among postoperative cataract patients at a tertiary care hospital.

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### INTRODUCTION

Drug utilization study was defined by WHO in 1977 as the marketing, distribution, prescription, and use of drugs with special emphasis on the medical, social and economic consequences.<sup>(1)</sup> Cataract is characterized by opacification of lens resulting in diminution of vision which is gradual and progressive. It is necessary to evaluate the pattern of drug utilization from time to time to increase therapeutic efficacy and to decrease adverse effects, unnecessary use of drugs and unnecessary expenses<sup>(2,3)</sup>. Drug therapy is a major component of patient care management in health care settings. Prescribers and consumers are flooded with a vast array of pharmaceutical product with innumerable brand names, available often at an unaffordable cost. Irrational and inappropriate use of drugs in health care system observed globally is a major concern<sup>(4)</sup>.

The list of drugs that are utilized in postoperative care in ophthalmic patients includes Antibiotics, NSAIDS, Steroids, Miotics, Mydriatics, and others. To address the rising antimicrobial resistance, physicians readily accept and indiscriminately use newly developed expensive and broad-spectrum antibiotics which further contribute to increase rates of antimicrobial resistance and health care cost<sup>(5)</sup>. Indiscriminate use of topical antibiotics and non-steroidal anti-inflammatory drugs cause histological and structural change in

conjunctiva<sup>(6,7)</sup>. WHO identified cataract as one of the major five ocular conditions which require immediate attention. Surgery is the only effective treatment for cataract. As with any surgery, cataract surgery also possesses risks such as infection, bleeding, inflammation and double vision. With prompt medical attention by using various drugs like antimicrobials, steroids, mydriatics, these conditions can be prevented and treated<sup>(8)</sup>. Vision 2020 aims to eliminate blindness due to cataract by performing cataract extraction with IOL implantation and also by increasing the number of cataract surgery rate<sup>(9,10)</sup>.

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 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<sup>(11-13)</sup>. Drug utilization studies aim to provide feedback to the prescriber and to create awareness among them about rational use of medicines.<sup>(14)</sup> There are many studies carried out in India on ocular drug utilization patterns but most of them are mainly in the outpatient department<sup>(15,16)</sup>. Very few studies are available on

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postoperative cases of cataract. Hence present study was undertaken for analysing the prescription pattern of drugs and reviewing the role of various drugs prescribed to postoperative cases of cataract which will help to improve patient compliance and will suggest some measures to improve rational prescription of drugs.

**Aim**

To study the Prescribing pattern of drugs in postoperative cases of cataract in ophthalmology department at tertiary care hospital using world health organization (WHO) core prescribing indicators so as to promote rational usage of drugs.

**MATERIALS AND METHODS**

**Study Design**

This is a prospective Observational study.

**Study population**

All case record of postoperative cases of cataract for a period of 18 months from Jan 2020 – June 2021 of ophthalmology department at G.M.C.H. Aurangabad were enrolled.

**Study site**

Department of ophthalmology in association with department of pharmacology at tertiary care hospital.

**Sample size**

All case record of postoperative cases of cataract for a period of 18 months from Jan 2020 – June 2021.

**Informed consent**

As there is no direct involvement of the patient’s, informed consent is not applicable. Still a blanket consent is taken from Head of the department of Ophthalmology. However, data regarding patients is kept confidential.

**Inclusion Criteria**

1. All case records forms of postoperative cataract patients between age group 18- 65 years.
2. Patients of either gender.
3. Willing to give written informed consent

**Exclusion Criteria**

1. Patients below 18 years and above 65 years of age.
2. Patients who were operated for ophthalmic condition outside the tertiary care hospital.
3. Patients who were not ready to give Informed consent.

**Study Procedure**

- All case records coming under the inclusion criteria has been studied.
- The case records will be taken from the record section of the hospital after obtaining no objection Certificate from concerned department.
- All the details of the treatment given to the patients has been recorded.
- Data so collected will be tabulated and analysis has been done accordingly.

**Statistical Analysis**

- The data obtained is analysed in Microsoft excel and categorical data is expressed as percentage.

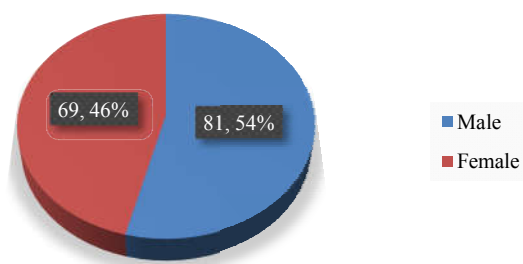
**Ethical Approval**

The study was approved by the Institutional Ethics Committee of Government Medical College, Aurangabad, Maharashtra India.

**RESULTS**

This study was conducted in the ophthalmology department in association with department of pharmacology at a tertiary a tertiary care teaching hospital in the Marathwada region of western India over 18 months (1<sup>st</sup> Jan 2020 to 31<sup>st</sup> June 2021). A total of 150 prescriptions were studied. Observations of the study are presented in the form of different tables and figures. Out of 150 patients, 81 (54 %) were male and 69 (46 %) were female as described in Figure – 1.

**Gender Distribution**



**Figure 1** Distribution of patients according to gender.

**Table 1** Distribution of patients according to age group.

Age group	Number of patients	percentage
Less than 40	15	10%
40-65	135	90%
Total	150	100%

They were classified into two age groups i.e., 18- 40 years and between 40 to 65 years. Maximum patient 135 (90 %) were in the age group between 40 to 65 years

**Table 2** Class of various drugs utilized among postoperative patients of Cataract.

Sr.no.	Drugs	No. of drugs	Percentage (%)
1	Antibiotics + steroids	150	18.22
2	Antibiotics	65	16.86
3	Analgesics	150	25.42
4	Proton pump inhibitor	150	20.85
5	Lubricating agent	21	8.90
6	Mydriatics	05	1.78
8	Other	26	7.12
9	Total	567	100

**Table 3** Prescription summery

Agents	No. of drugs used	Route of administration	Frequency & Duration
1. Gatifloxacin + Prednisolone	150	Eye drop (Topical)	6 t/d*1 week f/b 5t/d *1 week and so far, tapering
2. Ciprofloxacin	63	Tablet (oral)	500mg BD*5 days
3. Amoxicillin + Clavulanic acid	2	Tablet (oral)	625mg BD*5 days
4. Ibuprofen	150	Tablet (oral)	400mg BD* 5days
5. Hyper sol	21	Eye drop (Topical)	TDS according to redness
6. Pantoprazole	150	Tablet (oral)	40mg OD*5days
7. Atropine	5	Ointment (Topical)	BD *3days
8. Ren Olene	26	Eye drop (Topical)	TDS * 3 Days
Total	567		

**Table 4** Total no. of drugs Prescribed per patients.

Sr. No.	No. of Patients	No. of Drugs	Percentage (%)
3	52	156	27.51
4	79	316	55.74
5	19	95	16.75
<b>Total</b>	<b>150</b>	<b>567</b>	<b>100</b>

Polypharmacy was practised during treatment of patients. A minimum of 5 drugs per prescription and maximum of 4 drugs were prescribed to the postoperative patients of cataract.

**Table 5** Fixed drugs combinations given in postoperative patients of Cataract.

Sr.No.	Fixed dose combinations	No. of drugs	Percentage (%)
1	Gatifloxacin + Prednisolone	150	84.26
2	Amoxicillin + Clavulanate	2	1.2
3	Ren Olene	26	14.60
	Total	178	100

In this study total drugs prescribed were 567 out of which 178 (31.40%) were FDCs.

**Table 6** Treatment given in different formulations to postoperative patients of Cataract.

Sr.no.	Form of treatment	No. of drugs	Percentage (%)
1	Eye Drop	197	34.74
2	Eye Ointment / Gel	05	0.9
3	Tablet	365	64.37
	Total	567	100

In this study total of 567 drugs were prescribed out of which maximum 365 i.e. (64.37%) drugs were in tablet form.

**Table 7 A** Percentage of drugs prescribed from NLEM in postoperative patients of Cataract.

Sr.No.	Name of drugs	Included in NLEM (Yes/No)
1	Amoxycillin +Clavulanate	Yes
2	Ciprofloxacin	Yes
3	Ibuprofen	Yes
4	Atropine	Yes
5	Pantoprazole	Yes
6	Ren Olene	No
7	Hyper sol	No
8	Gatifloxacin + Prednisolone	No

**Table 7 B** Percentage of drugs prescribed from NLEM in postoperative patients of Cataract.

Category	Number of Drugs	Percentage (%)
Total Drugs From NLEM	370	65.26
Not From NLEM	197	34.74
<b>Total</b>	<b>567</b>	<b>100</b>

In this study (65.26%) drugs were prescribed from NLEM. Whereas (34.74%) drugs were not from NLEM

**Table 8** Percentage of drugs prescribed by generic and brand name.

Sr. No.	Drugs names	N0. Of drugs	Percentage (%)
1	Generic name	520	91.71
2	Brand name	47	8.29
	Total	567	100

In this study total of 567 drugs were prescribed out of which 520 i.e. (91.71%) drugs were prescribed by generic names whereas 47 i.e. (08.29%) drugs were by brand names.

**Table 9** WHO core prescribing indicators

WHO core prescribing indicators	No. of drugs	Percentage (%)
Total no. of prescriptions analysed	150	100
Total no. of drugs prescribed	567	100
Average number of drugs per prescription	3.8	-
Encounters with antibiotics	215	37.92
Encounters with injections	-	-
Drugs prescribed by generic name	520	91.71
Fixed drug combination	178	31.40
Drug from essential drug list	370	65.26
No. of drugs which are available in hospital	520	91.71

## DISCUSSION

- Drug utilization study is a powerful exploratory tool for prescription audit and evaluation of rational utilization of drug. Periodical evaluation of prescribing pattern is necessary to achieve an aim of rational use of drugs.<sup>(1)</sup>
- The present study reflects the general trend of drug prescription in 150 postoperative cases of Cataract.
- In this study the demographic parameters of the patients revealed the number of males were 81 (54%) while that of female were 69 (46%). which shows male preponderance over female. (**Fig. no. 1**).
- Similar male preponderance was seen in study done by Pooja Prajwal *et al.*<sup>(17)</sup> and it is in contrast to the studies done by Hiremath G *et al.*<sup>(18)</sup> & Adhikari *et al.*<sup>(19)</sup> wherein there was a female sex predominance was seen.
- As the study involved, a random selection of cases according to inclusion criteria the predominance of male patients over females may be only an incidental finding.
- Cataract is most commonly seen in elderly population though it is an eye disorder occur in all age groups. In this study, majority of patients belonged to the age group between 40 - 65 years of age (90%). (**Table-1**) This may be due to age related degenerative changes.
- Usual prescription was one antibiotic, one anti-inflammatory agent and one anti-acid drug and one analgesic agent. Antibiotics which were prescribed were different types of fluoroquinolones, to prevent development of endophthalmitis.<sup>(20)</sup>
- A total of 567 drugs were prescribed in 150 patients, among which 215 drugs i.e. (38%) were antibiotics, which were given either alone or in combination with steroids. Out of which eye drop Gatifloxacin + Prednisolone combination constituted 150 drugs i.e. (26%) followed by tab.ciprofloxacin 500mg constituted 63 drugs i.e. (12%) and tab. Amoxycillin + clavulanic acid 625mg constituted 2 drugs i.e. (1.17%) of total drugs. Analgesic drugs like tab. Ibuprofen 400mg constituted 150 drugs i.e. (26%) of total drugs. Proton pump inhibitor like tab. Pantoprazole 40mg constituted 150 drugs i.e. (26%) of total drugs. Lubricating agent like eye drop hyper sol was constitute 21 drugs i.e. (3.70%) of total drugs. Eye drop renolene was constitute 26 drugs i.e. (4.59%) of total drugs and atropine ointment constituted 5 drugs i.e. (1%) of total drugs. (**Table no. 2&3**)
- Similar findings were seen in Hoffman RS *et al.*<sup>(21)</sup>, Raut *et al.*<sup>(22)</sup>.
- Among the 150 patients, total 567 drugs were prescribed and the prescription index was 3.8. In this study polypharmacy was 100%. Drugs were prescribed in the range of 3-5 drugs per prescription, 3 drugs per prescription were seen in (27.51%) of the study population and 5 drugs per prescription were seen in (16.75%) of total cases. While 4 drugs per prescription were given to maximum i.e., 55.75% of study population. (**Table no.4**)
- In this study total drugs prescribed were 567 out of which 178i.e., (31.40%) were FDCs, among which most common fixed dose combination prescribed was Gatifloxacin + Prednisolone 150 i.e. (26.45%), followed by renolene 26 i.e. (4.58%), followed by amoxicillin + Clavulanate 2 i.e. (0.35%). (**Table no.5**)



- Which was less when compared to other study done by Kshirsagar *et al.* <sup>(23)</sup> where 36.9% FDC were prescribed & more when compared to study done by Ahmed MM *et al.* <sup>(24)</sup> where 22% FDC were prescribed.
- In this study total of 567 drugs were prescribed out of which 365 i.e.(64.37%) drugs were in tablet form, followed by eye drops 197 i.e.(34.74%), followed by ointment and gel forms of drugs combinedly contribute to 5i.e. (0.9%). **(Table no.6)**
- In this study, A total of 65.26% of drugs prescribed from National Essential Drug List. **(Table no.7 A & B)**.Which is less when compared to studies conducted by Hiremath G *et al.* <sup>(18)</sup>(80.49%) & Divya K *et al.* <sup>(25)</sup>(72.92%).
- In this study total of 567 drugs were prescribed out of which 520 i.e. (91.71%) drugs were prescribed by generic names whereas 47 i.e. (8.29%) drugs were by brand names. **(Table no.8)**
- There is a need to adhere to the essential drug list of particular country while prescribing as it promotes rational use of medicines which are safer, efficacious & cost effective. Fixed dose combination of drugs prescribed were 100%.

#### Limitations 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.
- The present study is however not without limitations. It was a single center study hence findings cannot be generalized. Larger prescribing pattern surveys involving more tertiary care hospitals should be conducted which will further throw light on drug utilization trends in prescribing.
- Patients' compliance of medication was not taken into account Education of prescriber is cornerstone of any successful treatment survey and adherence to guidelines by physicians will aid in improving prescribing behaviour to larger extent.

#### CONCLUSION

The present study indicate that the antibiotics followed by analgesics were most commonly prescribed drugs for postoperative patients of ophthalmology. 520 i.e.(91.71%) of the total drugs were prescribed by generic names. Polypharmacy index of 3.8 is of concern. Still, the report is in line with results obtained from similar studies, however there is a need to use a smaller number of drugs per patient.Data of this study can help the prescriber to improve their prescription writing by conducting different continuing medical education programmes. This study is a step forward in the broader assessment of safety and efficacy of prescription of drugs among postoperative cataract surgery patients at a tertiary care hospital.

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