

Evaluation of Prescribing and Utilization Pattern of Drugs Used in Post Cataract Surgery Patients at Tertiary Level Teaching Hospital in Western Rajasthan

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Abstract

Introduction: Cataract is the worldwide leading cause of blindness and the most prevalent ocular disease. In India, 62.6% cases of blindness due to cataract. Cataract surgery induces uncontrolled infection and inflammation which may leads to serious side effects, use of medicines is considered one of the most cost-effective medical interventions for treatment and prevention of disease.

Aim: To analyze and evaluate the drug utilization pattern in postoperative patients undergoing cataract surgery using world health organization (WHO) core prescribing indicators.

Materials and Methods: A Cross-sectional prospective observational study carried out over a period of six month from July 2021 to December 2021. Total 500 patients were selected during our study and were analyzed on the basis of inclusion and exclusion criteria.

Results: we analyzed a total of 500 prescriptions which includes 2889 drugs. Average no. of drugs per prescriptions was 5.7 with maximum 46.2% had 6 drugs. All patients were prescribed eye drops and the commonest FDC eye drops prescribed being gatifloxacin with prednisolone (69.2%). All prescriptions are with antibiotic and analgesic 2.6% injections were observed. About (28.6%) of the drugs were prescribed by brand name and (71.3%) by generic name. Percentage of drugs prescribed from essential drug list (55.4%).

Conclusion: Topical drugs were commonly prescribed to treat ocular infections. Evaluation of drugs using WHO core prescribing indicators showed that the number of drugs prescribed by generic names and from NLEM was low.

Keywords: Cataract surgery, Drug utilization, Generic names, WHO, Core prescribing indicator

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Introduction

Cataract is the most common ocular disease, which is characterized by opacification of lens resulting in gradual progressive diminution of vision & is most commonly seen in elderly. Development of opacity in the lens which is normally completely transparent is known as cataract.[1] Cataracts are most commonly due to aging but may also occur due to trauma or radiation exposure, be present from birth, or occur following eye surgery for other problems. Diagnosis is by an eye examination.[2]

The most recent data from World Health Organization (WHO) reveal that 47.8% of global blindness is due to cataract; and in south Asia region which includes India, 51% of blindness is due to cataract.[3] In India cataract is the principal cause of blindness accounting for 62.6% cases of blindness.[4]

Like other types of surgery, cataract surgery induces uncontrolled infection and inflammation which may leads to serious side effects such as hyphema, iris prolapse, anterior uveitis, bacterial endophthalmitis and secondary glaucoma.[5] Prevention and management of infection and inflammation is thus a mainstay in modern cataract surgery. As the surgical procedure has become less invasive, the recovery after surgery is now easier and patients usually no longer require in-patient hospital care after the operation. The modern minimally invasive cataracts surgery with phacoemulsification is considered as a minor procedure with an uneventful and pain-free recovery period. However, little attention has been paid to pain and other postoperative ocular irritation symptoms, and the data on the incidence of these symptoms is conflicting. In some studies, rather few patients have reported any complaints after surgery. [6,7]

Drug utilization research was defined by World Health Organization (WHO) in 1977 as the marketing, distribution, prescription,

and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences. To increase the therapeutic efficacy and minimize the development of resistance, drug utilization pattern needs to be evaluated periodically.[8]

Globally, it is determined that more than 50% of medicines are prescribed, distributed, or traded inappropriately and that 50% of all patients fail to consume their medicines properly.[9] This necessitates a periodic review of pattern of drug utilization to ensure safe and effective treatment. Periodic evaluation of drug utilization patterns needs to be done to enable suitable modifications in prescription of drugs to increase the therapeutic benefit and decrease the adverse effects and to provide feedback to the prescribers.[10]

Topically applied antibiotics are routinely use for the prophylaxis for postoperative bacterial ocular infection such as endophthalmitis. Fluoroquinolones have good efficacy against the causative organism of endophthalmitis. To control ocular inflammation Steroids and Non-steroidal anti-inflammatory drugs (NSAIDs) are available. Steroids are potent anti-inflammatory agents that work by acting on a number of intercellular inflammatory mediators, and NSAIDs work by inhibiting the cyclo-oxygenase enzymes. The cyclooxygenase enzymes catalyze the formation of prostaglandins (PGs) and thromboxane. Prostaglandins mediate inflammatory reactions. Preventing the formation of prostaglandins reduces the inflammatory process.[11]

Such a large number of medications require control over prescribing especially when many consider it to be unnecessary, inappropriate and downright dangerous to prevent drug interactions and poly pharmacy. So there is a need for a systematic review regarding the role of

drugs like antimicrobials, corticosteroids and mydriatics in such a setting.[12]

Drug utilization studies are the powerful exploratory tools to determine the role of drugs in the society and also forms an essential part of pharmacoepidemiology which helps in providing the insights into various aspects of drug prescribing and drug use. Hence present study was planned to analyze the drug used in ophthalmology department of tertiary care teaching hospital in post cataract surgery patients.

Materials and Methods

The Present study was conducted in department of Pharmacology in collaboration with department of Ophthalmology at Sardar Patel Medical College and Associated group of PBM Hospitals, Bikaner (Rajasthan). It was a cross sectional prospective study carried out over a period of six month from July 2021 to December 2021. Before starting the study, ethical approval was obtained from institutional ethics committee.

Total 500 patients were selected during our study and were analysed on the basis of inclusion and exclusion criteria.

Inclusion Criteria

- Patients of both sexes male and female.
- Age above 40 years operated for cataract.
- Willing to participate in the study.

Exclusion Criteria:

- Patients who are unable to co-operate.
- Patients with inability to give consent.
- Patients age below 40 years.
- Pregnant women.

Data of 500 patients were enrolled according to the inclusion and exclusion criteria. Data like name, age, sex, diagnosis, social habits and treatment was recorded from patient case file. Type of cataract, any

other associated disease, Distribution according to classes of drug prescribed, route of administration, dosage form, frequency of drug administration and duration of therapy. Drug use WHO cores prescribing indicators like average number of drugs used per prescription, Number of generic drugs prescribed, injections & antibiotics prescribed percentage, fixed dose combination. Number of essential drugs prescribed. Number of drugs prescribed from essential medicine list were also noted. All the information was recorded in case record form (CRF) which was designed according to WHO. Written informed consent was taken from all patients before enrolling them for the study.

Statistical Analysis

The results were collected and analyzed statistically with the tools like frequency averages/mean and percentage where ever applicable.

Results

A total 500 prescriptions were analyzed by using WHO delineated drug use indicators in post cataract patients of Ophthalmology department. Out of 500 patients, 62% were male and 38% were female. Patients were categorized based on their age into five groups. The maximum number of the patients found to be 61 -70 (36.8%) years age group; followed by 29.2 % in 51-60 years age group and minimum patients were in 41-50 age group. The mean age of the total study patients 62.6 ± 18.10 (Figure 1)

Majority of the cataract cases diagnosed were of senile mature cataract 44.8%, senile immature cataract 45.2% followed by nuclear mature cataract 5% and remaining 5% accounting for posterior sub-capsular cataract.

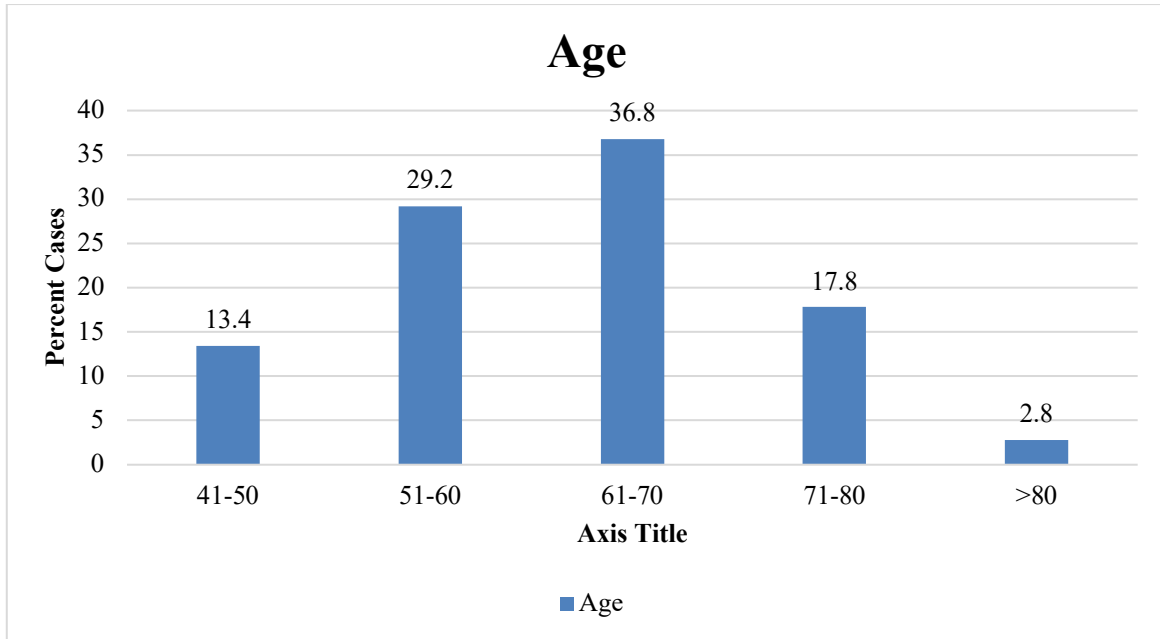


Figure 1: Age wise distribution of patients

In current Study, a total of 500 prescriptions were analyzed which included 2889 drugs. The number of drugs per prescription varied from five to seven drugs, 38% of prescriptions had five drugs followed by 46.2% of prescriptions were six drugs which is maximum and 15.8% of prescriptions were seven drugs as depicted Figure 2.

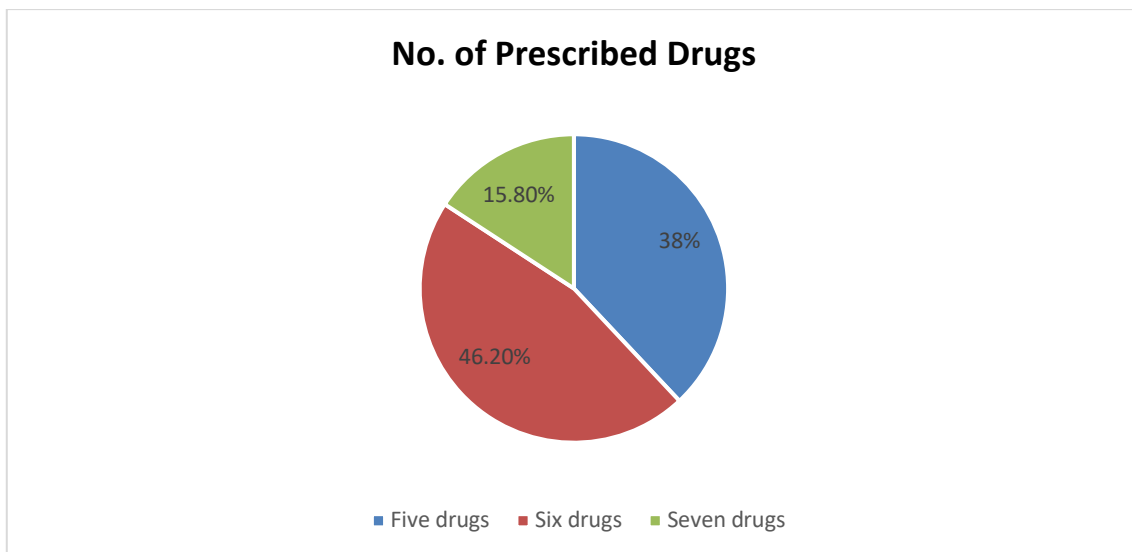


Figure 2: Number of Prescribed drugs as poly pharmacy

Evaluation of drugs using WHO core prescribing indicators are depicted in table no.1. A total of 500 prescriptions were analyzed which included 2889 drugs. Each patient, average number of drugs was prescribed 5.77 per prescription. Total encounters with injections & antibiotics

prescribed were 2.6% & 100% respectively. The percentage of generic drug was 71.37% and branded drug was 28.86%. Percentage of drugs prescribed from National list of essential medicines 2022 were 55.41% and Fixed dose combinations were 29.80%. (Shown in Tables 1).

**Table 1: Who Core Prescribing Indicators:
(Total Number Of Patients (N) = 500)**

WHO core prescribing indicators	Number	Percentage (%)
Average no. of drug per prescription	5.77	-
Total encounters of injection	13	2.6
Drug prescribed by Brand names	834	28.86
Drug prescribed by Generic names	2062	71.37
Essential drug	1601	55.41
Fixed drug combination	861	29.80

The commonest dosage form prescribed was topical formulations in the form of eye drops 100% and oral formulations 100% followed by injectables were 2.6% as depicted in Figure 3.

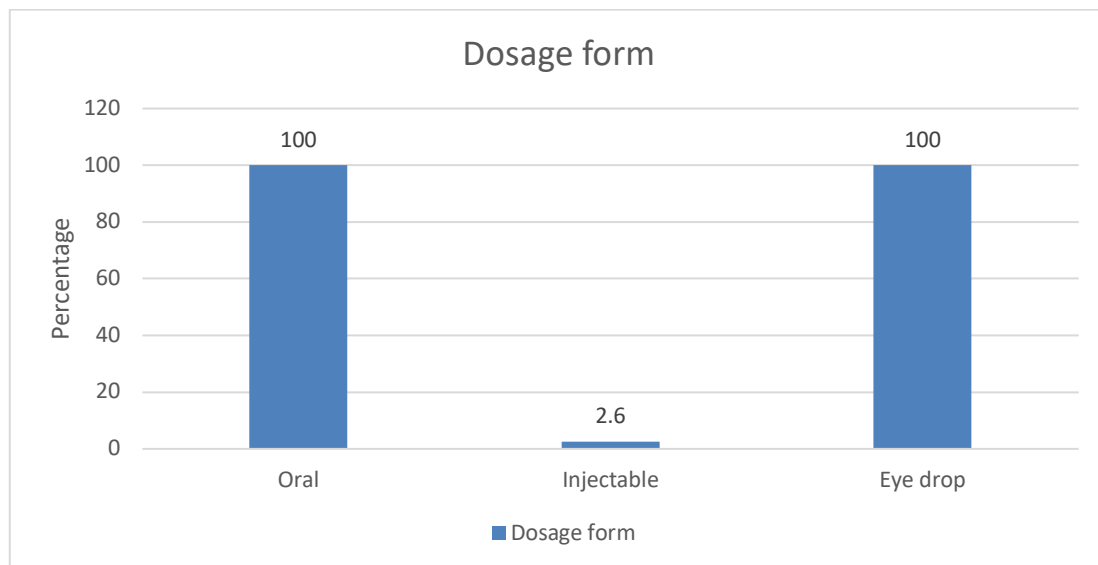


Figure 3 : Prescribed Dosage Form in post cataract patients

In post-operative medication oral antibiotic 56.2% given cefixime drug whereas ciprofloxacin in 43.8%. Diclofenac + paracetamol combination and omeprazole were given to all cases. as supplements multivitamin was given in 100% cases. serratiopeptidase in 2% cases and prednisolone was given in 3.6% cases. Where in eye drop 69.2% given Gatifloxacin+prednisolone combination drug whereas 22.6% had Gatifloxacin. Cyclopentolate was given with Gatifloxacin in 3.4% cases. Moxifloxacin +

Dexamethasone combination was given in 4.8%. Flurbiprofen in 15% and tobramycin in 4.6%. (Shown in table 2).

In current study, our comparison stated that oral Cefixime is the most frequently prescribed anti-microbial post-operatively for IOL implantation. And most common FDC Gatifloxacin+ Prednisolone eye drops were the most frequently utilised corticosteroids to prevent and treat post-operative inflammation.

Table 2. Prescribing frequency of drugs in post operative cataract patient

Oral Drugs	Number	Percentage
Cefixime	281	56.2
Ciprofloxacin	219	43.8
Diclofenac + paracetamol	500	100
Omeprazole	500	100
B complex/ MVI	500	100

Prednisolone	18	3.6
Serratiopeptidase	10	2
Eye drop	Number	Percentage
Gatifloxacin	113	22.6
Cyclopentolate	17	3.4
Gatifloxacin+Prednisolone	346	69.2
Moxifloxacin+dexamethasone	24	4.8
Flurbiprofen	75	15
Tobramycin	23	4.6

Discussion

Drug utilization studies are the powerful exploratory tools to determine the role of drugs in the society and also forms an essential part of pharmaco-epidemiology which helps in providing the insights into various aspects of drug prescribing and drug use. So this study was done to evaluate drug utilization pattern among patients who have undergone cataract surgery.

A total number of 500 prescriptions were analyzed during the study period who visited Ophthalmology in-patient Department. Age is the most common cause of cataracts. In the present study, maximum 36.8% cases were of 61 – 70 yrs age followed by 29.2% of 51 – 60 yrs with mean age of study population was 62.6 ± 18.10 yrs with age range of 40 yrs -80 yrs. Similarly Patil E et al [13] found that the majority of cataract patients belong to the age group of 40- 65 years. Also Arshad M et al [14] observed that the maximum 69.57% cataract patients belonged to age group of 45-65 years.

In our study maximum 62% cases were male and 38% were female. On contrary Ashish G et al [15] found that there was no sex preponderance. Arshad M et al [14] found female sex predominance (69.57%).

In the present study, as mentioned above 500 prescriptions were analyzed and the total numbers of drugs prescribed were 2889. Average number of drugs per prescription is an important index as it tends to measure the degree of poly pharmacy. It is preferable to keep the number of drugs per prescription as low as possible since

higher figures lead to increased risk of drug interactions, adverse effects, development of bacterial resistance and increased cost to the patient. [16]

In our study, maximum 46.2% had prescribed 6 medicines whereas minimum 15.8% prescribed 7 drugs, with mean drug per prescription was 5.77 ± 0.69 drugs. Similarly Hiremath G et al [17] found that average number of drugs per prescription was 5.1. Also Prajwal P et al [18] found that average number of drugs per prescription was 4.325.

In our study, all prescription had oral drugs and eye drops only 2.6% prescription had injectables. Similarly Prajwal P et al [18] The maximum number of drugs prescribed were in the form of eye drops (67.65 %), followed by tablet (7.8 %), and injection (2.12 %). Also Banerjee I et al [19] different dosage forms with eye drops being the most common (70.8%) followed by tablets (15.9%), injections contributed 2.1% of all dosage forms. Also Divya K et al [20] Percentage of prescription with injections were (0.89%).

In our study oral antibiotic cefixime drug prescribed in prescription 56.2% whereas ciprofloxacin in 43.8%. Diclofenac + paracetamol combination and omeprazole were given to all cases. As supplements multivitamin was given in 100% cases. Serratiopeptidase in 2% cases and prednisolone was given in 3.6% cases. Similarly Jadhav PR et al [21] found that antibiotics was seen in 44.83% prescription. Fluoroquinolones accounted for 60% of the total antimicrobial drugs and also in

Binjawadgi A et al [22] oral ciprofloxacin was prescribed to nearly 8% of the patients and also Banerjee I et al [19] found that antimicrobials were most commonly prescribed (36.4%) followed by anti-inflammatory and anti-allergic (24.2%), multivitamins (4.6%).

In our study, 69.2% given Gatifloxacin+prednisolone combination drug whereas 22.6% had Gatifloxacin. Cyclopentolate was given with Gatifloxacin in 3.4% cases. Moxifloxacin+dexamethasone combination was given in 4.8%. Flurbiprofen in 15% and tobramycin in 4.6%. Similarly Jadhav PR et al [21] found that Gatifloxacin was the most frequently prescribed (60%). Another study Patil E et al [13] found that, eye drop Gatifloxacin+Prednisolone FDC is given to all patients.

Generic drug use in India is yet to gain wide spread popularity; the economic benefits of generic drug use are however well-known and undisputed. [23] In our study, Total drug prescribed were 2889 out of them 834 (28.86%) were branded whereas 2062 (71.37%) generic. 1601 (55.41%) were essential drugs and 861 (29.80%) were fixed drug combination. Similarly Hiremath G et al [17] found that drugs which prescribed in generic name were 60.99% and also Patil E et al [13] Percentage of drugs prescribed by generic name was 91.71%. Also Hiremath G et al [17] overall percentage of drugs prescribed by brand name was 38.94% which includes 100% eye drops were prescribed by brand names. On contrary, other study Divya K et al. [20] found that about (94.54%) of the drugs were prescribed by brand name and only (5.4%) by generic name.

Hiremath G et al [17] in their study found that fixed drug combination includes 19.50% and drugs from essential drug list used were 80.49%. Arshad M et al [14] also found that percentage of drugs prescribed from national list of essential medicines (NLEM) 2015 was 92.77% & fixed dose

combination (FDC) prescribed were 15.69%. In the study of Ashish G et al [15] fixed dose combinations prescribed were 36.98%. Also Banerjee I et al [19] 62% of drugs were prescribed from national essential medicine list.

The present study revealed certain lacunae in the prescribing practices of the Ophthalmologists in this institute evident by the low generic prescribing. There is margin for betterment. Ophthalmologists should be courage to prescribe by generic name and opt for essential drugs from National List of Essential Medicines.

Conclusion

Fluoroquinolones and corticosteroids were the most frequently prescribed drug groups in post cataract surgery patients. Rational prescribing is an important criterion for convenience of a patient in terms of disease, adverse events and treatment cost. Study data may be helpful to understand the need of writing generic name in prescriptions, adherence with the National essential drugs list policy and availability of chief alternative medicines in hospital pharmacy. Health care providers have to take initiative for rational prescribing keeping in mind that it is not only a matter of national policy but also the wellbeing of individual patient. It also increases the quality management of cataract in India.

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