



ISSN (E): 2277- 7695

ISSN (P): 2349-8242

NAAS Rating: 5.03

TPI 2020; 9(3): 733-736

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www.thepharmajournal.com

Received: 01-01-2020

Accepted: 03-02-2020

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Prescribing and utilization pattern of drugs used among cataract surgery patients in a tertiary care teaching hospital

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Abstract

Objectives: To analyze and evaluate the prescribing & utilization pattern of drugs used preoperatively, intraoperatively and postoperatively in patients undergoing cataract surgery using world health organisation (WHO) core prescribing indicators so as to promote rational usage of drugs among cataract surgery patients.

Materials and Methods: This was a retrospective, observational hospital based study, carried out in the medical record section department of Raichur institute of medical sciences, a tertiary care teaching hospital in raichur, karnataka. A total of 138 patient's prescriptions/case record forms were collected who were admitted during the period of 6 months from January 2019 to June 2019 and the data collected was analysed using WHO core prescribing drug use indicators.

Results: The maximum number of cataract patients belonged to age group of 45-65 years (69.57%) with female sex predominance (69.57%). The average number of drugs per prescription was 4.7. Ciprofloxacin, ranitidine, ciprofloxacin+dexamethasone, diclofenac accounted for majority of the drugs prescribed. Percentage of encounters in which an antibiotic was prescribed was 99.27%, percentage of drugs prescribed by generic name was 05.38%, percentage of drugs prescribed from national list of essential medicines (NLEM) 2015 was 92.77% & fixed dose combination (FDC) prescribed were 15.69%.

Conclusion: To conclude, our study gave us an in general pattern about use of drugs among cataract surgery patients in our tertiary care teaching hospital. Poly pharmacy and high percentage of antibiotics prescription & low percentage of prescription of drugs by generic names are some concerns that need to be addressed to promote rational prescribing habit. However prescribing according to the essential drug list is good in our hospital.

Keywords: Drug utilization study, Cataract surgery patients, WHO prescribing indicators, Raichur, polypharmacy

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. It can be congenital, developmental or acquired. A cataract can be unilateral or bilateral ^[1].

Cataract is the worldwide leading cause of blindness and the most prevalent ocular disease. Cataract is responsible for 60-80% of all blindness in India in the older populations and 44% among populations of all ages. ^[2] Cataract surgery is one of the most commonly performed elective surgical procedures throughout the country. Just like any surgical procedure, cataract surgery also causes infection and inflammation which may cause some adverse effects like bacterial endophthalmitis, iris prolapse, hyphaema, secondary glaucoma & anterior uveitis ^[3]. Prevention and management of infection and inflammation is thus a mainstay in modern cataract surgery, which can be achieved by drugs like antimicrobials, steroids, non-steroidal anti-inflammatory drugs (NSAID's), mydriatics, etc. ^[4].

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 polypharmacy ^[5]. Hence there is a need for a systematic review regarding the role of drugs like antimicrobials, corticosteroids, NSAIDs and mydriatics, in such a setting ^[6]. So, the present study was undertaken to analyze & study the prescription pattern of drugs and

systematically review the role of various drugs prescribed to patients undergoing cataract surgery in a tertiary care teaching hospital, which will further help to improve the patient compliance and will suggest some measures to improve rational prescribing of drugs.

Materials and Methods

The study was carried out in the medical record section department of Raichur institute of medical sciences, Raichur, a tertiary care teaching hospital, wherein case sheets of patients of ophthalmology department who have undergone cataract surgery during the tenure of 6 months from January 2019 to June 2019 were collected and analysed. This was a retrospective, observational hospital based study. We have not performed any activity on the patients but only data have been collected. Ethical committee approval was obtained from the Institutional ethics committee of Raichur institute of medical sciences, Raichur, India prior to the commencement of the study.

The present study included patients of any age group and both the sexes (male/female) who were diagnosed as having cataract & operated for the presenting cataract. Patients admitted to the ophthalmology department who were not diagnosed as having cataract & patients not operated due to any underlying cause/refused operation were excluded from this study. A total of 138 prescriptions were collected & data analysed.

Data analysis

Data was recorded in previously prepared case record form. The data thus obtained from the analysis of 138 prescriptions was further condensed and a master chart was prepared using MS-Excel. The data was subjected to statistical analysis. The different variables were expressed as frequencies and percentages.

The overall information generated from the collected data of cataract surgery undergone patients was presented under the following headings:

1. Dermographic characteristics like age, sex of patients and duration of hospital stay
2. Type of cataract, comorbidities associated with cataract
3. Drug use WHO core prescribing indicators like average number of drugs used per prescription, number of generic drugs prescribed, number of essential drugs prescribed, injections & antibiotics prescribed percentage.
4. Formulation of drug most commonly prescribed & fixed dose combination of drugs
5. Pre-operative, intraoperative, postoperative drugs & drugs prescribed on discharge employed in patients undergoing cataract surgery

Results

A total of 138 patient's prescriptions/case record forms were collected and the data collected was analysed using WHO core prescribing drug use indicators.

Patients were categorized based on their age into three groups. Less than 45 years accounted for 8.7%, 45-65 years accounted for 69.57% and more than 65 years accounted for 21.74%. Out of 138 patients, 30.43% were male and 69.57% were females as depicted in table 1.

Majority of the cataract cases diagnosed were of senile mature cataract 61.59%, followed by senile immature cataract 37.68% & remaining 0.72% accounting for zonular congenital cataract. There was no much difference in incidence of

cataract occurrence in both eyes i.e. right eye constituting 70 (50.72%) and left eye 68 (49.28%). In majority 92.75% of patients, duration of hospital stay was for 0-5 days followed by 6-10 days in 5.07% & more than 10 days in 2.17% of patients.

The most common symptom of presentation in all patients is diminution of vision in the affected eye & only 3 patients presented with watering of eyes. They were associated with other co-morbidities like diabetes mellitus in 2.9% of patients, hypertension in 5.07% and both DM+HTN in 3.62% of patients & other morbidities in 1.45% patients.

A total of 138 prescriptions were analyzed which included 650 drugs. Evaluation of drugs using WHO core prescribing indicators are depicted in table 2. Average number of drugs per prescription was 4.7. Total encounters with injections & antibiotics prescribed were 100% & 99.27% respectively. The percentage of drugs prescribed by generic name was 5.38% and percentage of drugs prescribed from National list of essential medicines 2015 (NLEM 2015) were 92.77%. The number of drugs per prescription varied from 03 to 08 drugs as depicted in table 3. Out of 138 patients prescribed, 97.83% of patients received topical dosage form in the form of eye drops & 96.38% patients received oral formulation.

In the present study the most commonly prescribed preoperative, postoperative & on discharge medications include ciprofloxacin (99.28%), ranitidine (94.93%), diclofenac (90.58%), ciprofloxacin+dexamethasone (73.91%) & others as depicted in table 4 and intraoperatively lignocaine, local anesthetic drug was given to all patients for the surgical purpose. Number of antibiotics prescribed in a prescription is depicted in table no 5 wherein maximum 96.38% patients were prescribed only one antibiotic i.e. ciprofloxacin. Out of total 650 drugs prescribed to the patients, 102 drugs (15.69%) were prescribed as fixed dose combination (FDC) & ciprofloxacin+dexamethasone combination was the most common FDC prescribed.

Table 1: Dermographic characteristics of enrolled patients (total-138)

Characteristic	Data (%)
Male	42 (30.43%)
Female	96(69.57%)
Age in years	
Less than 45	12(8.70%)
45-65	96(69.57%)
More than 65	30(21.74%)

Table 2: WHO core prescribing indicators.

WHO core prescribing indicators	Frequency (%)
Average number of drugs per prescription	650/138=4.7
Total encounters having injectable preparations	138/138=100%
Total encounters having antibiotic prescribed	137/138=99.27%
Drugs prescribed by generic name	35/650=05.38%
Drugs prescribed included in Essential drug list	603/650=92.77%

Table 3: Total no of drugs per prescription

No. of drugs	No. of encounters (%)
3	04 (2.9%)
4	24 (17.39%)
5	80 (57.97%)
6	23 (16.67%)
7	06 (4.35%)
8	01 (0.72%)

Table 4: Most frequently prescribed preoperative & postoperative medications

S. No	Medication name	No of prescriptions (%)
	Ciprofloxacin	137 (99.28%)
	Ranitidine	131 (94.93%)
	Diclofenac	125 (90.58%)
	Ciprofloxacin+dexamethasone	102 (73.91%)
	Acetazolamide	18 (13.04%)
	Paracetamol	17 (12.32%)
	Alprazolam	15 (10.87%)
	Mannitol	04 (2.90%)
	Cefadroxil	04 (2.90%)
	Amlodipine	03 (2.17%)

Table 5: Number of antibiotics prescribed in a prescription

No of antibiotics prescribed	No of encounters (%)
0	1 (0.72%)
1	133 (96.38%)
2	04 (2.90%)

Discussion

Drug utilization research is a powerful exploratory tool for prescription audit and evaluation of rational utilization of drug. Periodical auditing of prescriptions is necessary to achieve the goal of rational prescription as stated by WHO. So this study was done to evaluate drug utilization pattern among patients who have undergone cataract surgery.

Authors analysed drug utilization pattern of 138 patients retrospectively who underwent cataract surgery. It was found that numbers of females (69.57%) were more than males (30.43%) showing female sex predominance. This is similar to studies done by Hiremath G *et al.* [7] & Adhikari *et al.* [4] wherein also there was also female sex predominance. Present study is in contrast with study done by Pooja Prajwal *et al.* [8], where males were more than females.

Cataract can occur in all age group, but it is a disease of older age group. The maximum number of patients in present study belongs to age group of 45-65 years (69.57%), this finding is similar to studies done by Ahmed MM *et al.* [9], Hiremath G *et al.* [7] where maximum patients belonged to age group of 45-65 yr & above 60 years.

In the present study, as mentioned above 138 prescriptions were analyzed and the total numbers of drugs prescribed were 650. Average number of drugs per prescription is an important index as it tends to measure the degree of polypharmacy of drugs. Average number of drugs per prescription was 4.7 in our study. The above finding is in concordance with a study conducted by Hiremath G *et al.* [7] (5.1) and it is more when compared to studies done by Divya K *et al.* [10] (3.91), Rajesh *et al.* [11] (3.52) and Pooja Prajwal *et al.* (3.28) [8]. As per WHO, the average number of drugs should be kept low & monitored to prevent over prescribing and to avoid the risk of drug-drug interactions.

The analysis of prescriptions showed, topical formulation as eye drops were prescribed to 97.83% of patients & oral formulations to 96.38%. The study result was consistent with study conducted by Pooja Prajwal *et al.* [8] & Divya K *et al.* [10] & Adhikari *et al.* [4] which also reported that maximum numbers of drug prescribed were in topical formulation. A topical formulation is always preferred to minimize systemic side effects in ophthalmic practice as it is more patient compliant too.

Drugs like antibacterials, analgesics, anti-inflammatory like NSAIDs, H2 receptor blockers, steroids, were commonly

prescribed in our study. This finding is similar to the studies conducted by Hiremath G *et al.* [7], Divya K *et al.* [10], Adhikari *et al.* [4] & Pooja Prajwal *et al.* [8] wherein these drugs are commonly prescribed. Anti-inflammatory and analgesics were used to minimize pain and inflammation. Steroids were used to prevent inflammation and with antibacterials to enhance cure rate. Broad spectrum antibiotic were used to prevent infection [12].

In our study antibacterials are prescribed to almost all 138 patients. Among antibacterials, fluoroquinolones were frequently used, as they have extended spectrum of activity against gram negative as well as gram positive organisms and fewer side effects on topical administration [13]. As per WHO, 15%-20% prescription with antibiotics is recommended in most of the countries where infectious disease is more prevalent [14]. So appropriate use of antimicrobials is absolutely necessary to prevent drug resistance. High use of antibiotics reflects the condition of poor sanitation, nutrition, prevalence of various infections and certain acute infective conditions which need conservative treatment [7]. The frequency, dosage and duration of drug therapy are the three important parameters and if not clearly recorded, can result in indiscriminate, injudicious use of drugs and therapeutic failure [15]. The above parameters were clearly recorded in all the prescriptions analyzed.

All patients received two eye drops. Ciprofloxacin eye drops and a fixed drug combination of dexamethasone plus ciprofloxacin eye drops. Topical steroids were prescribed to prevent postoperative anterior segment inflammation. Anti-inflammatory drugs were prescribed to prevent macular edema after cataract surgery [4]. More than 90% of patients received oral therapy for few days post operatively with one antibacterial ciprofloxacin, one non steroidal antiinflammatory drug diclofenac along with ranitidine. Acetazolamide and mannitol were given preoperatively to decrease intraocular pressure & alprazolam is given to decrease anxiety in few patients in our study.

The percentage of drugs prescribed by generic name was 5.38% which was lower than that recommended by WHO (100%), and also lower when compared to other studies like done by Hiremath G *et al.* [7] (60.99%) & Pooja Prajwal *et al.* [8] (32%). Prescribing drugs by generic name makes the treatment cost effective and it avoids prescription writing errors. Hence there is a need to encourage generic prescribing in our hospital by educational intervention methods and strict compliance to WHO drug policies [10].

The percentage of drugs prescribed from the National list of essential medicine of India (NLEM 2015) was 92.77% which is higher when compared to studies conducted by Hiremath G *et al.* [7] (80.49%) & Divya K *et al.* [10] (72.92%). WHO recommends the drugs prescribed from essential medicine list (NLEM) to be 100% which is slightly lower in the present study. 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 15.69 % in our study which was less when compared to other studies done by Kshirsagar *et al.* [16] where 36.9% FDC were prescribed & by Ahmed MM *et al.* [9] where 22% FDC were prescribed.

Conclusion

Evaluation of drugs using WHO core prescribing indicators concluded that the number of drugs prescribed by generic

names was very low in our study, when compared to WHO standards and needs improvement. Also we found that poly pharmacy was very common in our study which needs to be addressed. But prescribing drugs from essential drug list is good in our hospital. In our study overall rational prescription was found in maximum places. Data of this study can help the ophthalmologist to make appropriate revision in their prescribing practice. Prescribers can be trained in rational prescription 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 cataract surgery patients in a teaching hospital.

Acknowledgement

The authors are thankful to the Director and Medical superintendent, Raichur institute of medical science, RIMS tertiary care teaching hospital -Raichur for their unlimited help and support to carry out this research work.

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