Medications Used Before and After Cataract Surgery in A Tertiary Care Hospital

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Abstract
Introduction: Cataract is the most common ocular disease, which is characterized by opacification of lens resulting in gradual progressive diminution of vision. Drug utilization research contributes to the rational drug use by describing the pattern of drug use and interventions.

Aim and Objectives: 1. To know the drug utilization pattern in patients undergoing cataract surgery preoperatively and postoperatively. 2. To study rational use of drugs.

Material & Methods: The study was conducted by the department of pharmacology of a tertiary care hospital, Nanded retrospectively in Ophthalmology ward. case record papers of the cataract patients admitted for the surgery during 6 months period were screened. Data from the case record papers were collected and analyzed for details of the surgery, utilization pattern of drugs prescribed like type of drug, dosage form, dose, route of administration, frequency of administration and duration of therapy.

Observations: Total 424 cases of cataract were operated. Different group of drugs were prescribed preoperatively, intraoperatively, postoperatively. Most frequently prescribed topical antibiotic preoperatively was Norfloxacain (86.79%) and postoperatively was ofloxacin (76.88%). Other drugs prescribed were flurbiprofen, tropicamide- phenylephrin combination eye drops, Ofloxacin and dexamethasone combinations, rantac, timolol, Acetzolamide.

Conclusion: Overall rational prescription was found in maximum places. Data of this study can help the ophthalmologist to make appropriate revision in their prescribing practice.

Introduction
Cataract is the most common ocular disease, which is characterized by opacification of lens resulting gradual progressive diminution of vision. Most commonly seen in elderly. 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. It is necessary to evaluate the pattern of drug utilization from time to time to increase therapeutic efficacy and to decrease adverse effects, inappropriate use of drugs and unnecessary use of drugs and unnecessary expenses. Drug utilization research contributes to the rational drug use by describing the pattern of drug use and interventions.

There are many studies available with drug utilization pattern of different diseases, among these some were conducted for ocular conditions.
but most of them are OPD based studies.\(^4\)\(^-\)\(^9\). Data regarding studies conducted in inpatient department of ophthalmology is not available. So the present was undertaken to know the drug utilization pattern among the patients admitted to ophthalmology ward for the cataract surgery in a tertiary care hospital.

**Aim & Objectives**

1. To know the drug utilization pattern in patients undergoing cataract surgery preoperatively and postoperatively.
2. To study rational use of drugs.

**Material & Methods**

The study was conducted by the department of pharmacology of a tertiary care hospital, Nanded. Institutional ethics committee permission was taken for the conduction of study.

It was a retrospective study, in which case record papers of the cataract patients admitted in ophthalmology wards for the surgery during June 2014 to Dec 2014 were screened. Screening was done over the period of 3 months.

Data from the case record papers were collected and entered in preformed case record form (CRF).

Patients demographic profile, details of the surgery performed like type of surgery, utilization pattern of drugs prescribed like type of drug, dosage form, dose, route of administration, frequency of administration and duration of therapy were entered in case record form. Whole data was analyzed for percentage of different drugs prescribed preoperatively, for intra operative period, and postoperative period. Rationality in respect of drugs prescribed was also evaluated.

**Observations**

During the study total number of cases screened of cataract surgery during 6 month period were found to be 424, out of which 99.37% patients were above 40 years of age and 0.63% were children below 8 years.

Type of surgery performed was extra capsular excision (ECCE) with implantation of intraocular lens. Drugs prescribed preoperatively, peroperative and postoperatively as shown in table 1-3. Most frequently prescribed topical antibiotic preoperatively was Norfloxacin (86.79%) (table 1) and postoperatively was ofloxacin (76.88%) (table3). Ofloxacin and ciprofloxacin were combined with steroids in 0.94% preoperatively and 99.29% postoperatively. Oral antibiotics were prescribed in both preoperative and postoperative period. Flurbiprofen eye drops were prescribed to 100% patients during preoperative period. Oral ibuprofen prescribed to 94.09% cases postoperatively along with oral antacids in 91.74% cases and rantac tablet in 65.09% patients. Mydriatic and cycloplegic agent was tropicamide which is combined with phenylephrin in 89.85% cases preoperatively, cyclopentolate in 349(82.21%) elderly patients and atropine ointment 2 (0.47%) in children postoperatively. Tropicamide-phenylephrin combination was prescribed in 54 (12.73%) postoperative patients while tropicamide alone given in 19(4.48%) cases. In patients with raised IOP during preoperative period drugs prescribed were manitol, acetazolamide tablets and timolol eye drop and postoperatively given drugs are acetazolamide and timolol. Drugs prescribed during the surgery (table 2) were local anaesthetics in 99.53% patients as peribulbar injections, general anaesthetic by inhalational route by in 0.47% patients. Gentamicin and dexamethasone injections were given by subconjunctival route in 100% patients during the cataract surgery.

Hypertensive patients undergoing cataract surgery were total 28. In that those having blood pressure >160/100 mmhg were given different antihypertensives like ACE inhibitors, beta blockers, Calcium channel blockers, AT1 antagonist (Table 4). 10 patients were having diabetis, among them 4 were given drugs like Insulin, Sulfonylureas, Biguanides (table 5).
Table 1: Drugs Prescribed Preoperatively for Cataract Surgery Cases (n=424)

| Drugs           | No of Cases (%) | Combined with and No of cases | Route and Dosage | Frequency and Duration |
|-----------------|-----------------|-------------------------------|------------------|-----------------------|
| Norfloxacin     | 368(86.79)      | -                             | Eye drop         |                       |
| Ofloxacin       | 40(9.43)        | Dexamethasone-1 Prednisolone - 1 | Eye drop         |                       |
| Moxifloxacin    | 9(2.12%)        | -                             | Eye drop         |                       |
| Ciprofloxacin   | 7(1.65%)        | Dexamethasone-2               | Eye drop         |                       |
| Gatifloxacin    | 6(1.41)         | -                             | Tablet 400mg     | Single dose 2 hours before surgery |
| Moxifloxacin    | 3(0.71)         | -                             | Tablet 400mg     |                       |
| Ciprofloxacin   | 2(0.47)         | -                             | Tablet 750mg     |                       |
| Flurbiprofen    | 424(100)        | -                             | Eye drop         |                       |
| Tropicamide     | 381(89.85)      | Phenylephrin-381              | Eye drop         | 1 drop at 15 minutes interval on day of surgery |
| Tropicamide     | 34(8.01)        | -                             | Eye drop         |                       |
| Atropine        | 9(2.12)         | -                             | ointment         | Thrice daily X 3days  |
| Manitol         | 1(0.23)         | -                             | infusion         | 300 ml in 30 minutes  |
| Acetazolamide   | 2(0.47)         | -                             | Tablet 250 mg    | 1 tablet 3 times x 1 day |
| Timolol         | 2(0.47)         | -                             | Eye drop         | 1 drop 2 times x 1 day |

Table 2: Drugs Prescribed Peroperatively for Cataract Surgery Cases (n=424)

| Drugs           | No of Cases (%) | Combined with and No of cases | Route and Dosage | Frequency and Duration |
|-----------------|-----------------|-------------------------------|------------------|-----------------------|
| Local anaesthetic | 422(99.53)    | -                             | Peribulbar injection | Once               |
| General anaesthetic | 2(0.47)       | -                             | Inhalation       |                       |
| Gentamicin      | 424(100)       | -                             | Subconjuctival injection | Once at the end of operation |
| Dexamethasone   | 424(100)       | -                             |                  |                       |

Table 3: Drugs Prescribed Postoperatively for Cataract Surgery Cases (n=424)

| Drugs           | No of Cases (%) | Combined with and No of cases | Route and Dosage | Frequency and Duration |
|-----------------|-----------------|-------------------------------|------------------|-----------------------|
| Ofloxacin       | 326(76.88)      | Dexamethasone-73 Prednisolone- 253 | Eye drops        | 1 drop 6 times x 7 days |
| Ciprofloxacin   | 95(22.40)       | Dexamethasone-95 Total-421(99.29%) |                  |                       |
| Norfloxacin     | 2(0.47)         | -                             |                  | 1 drop 1 hourly       |
| Moxifloxacin    | 1(0.23)         | -                             |                  |                       |
| Gatifloxacin    | 1(0.23)         | -                             | Tablet 400mg     | Twice daily x 4 days  |
| Ciprofloxacin   | 13(3.06)        | -                             | Tablet 400mg     | Twice daily x 4 days  |
| cefalexin       | 2(0.47)         | -                             | syrup            | 1 teaspoonful twice daily x 5 days |
| Ibuprofen       | 398(93.86)      | 1(0.23)                       | Tablet 400mg     | Twice daily x 5 days or sos |
| Antacid         | 389(91.74)      | -                             | Tablet 400mg     | Twice daily x 5 days  |
| Rantac          | 276(65.09)      | -                             | Tablet 150mg     | Twice daily x 5 days  |
| cyclopentolate  | 349(82.21)      | -                             |                  | 1 drop at HS x 7 days |
| Tropicamide     | 54(12.73)       | Phenylephrin-54               | Eye drops        | 1 drop at HS x 7 days |
| Tropicamide     | 19(4.48)        | -                             |                  | 1 drop at HS x 7 days |
| Atropine        | 2(0.47)         | -                             | ointment         | Twice daily x 7 days  |
| Acetazolamide   | 9(2.12)         | -                             | Tablet 250 mg    | 1 tablet 3 times x 3 days |
| Timolol         | 5(1.18)         | -                             | Eye drop         | 1 drop 2 times x 3 days |
| Prednisolone    | 10(2.35)        | -                             | Tablet 50 mg     | Once daily x 10 days  |
| Diazepam        | 11(2.59)        | -                             | Tablet 5 mg      | 1 tablet at HS x 3 days |
| Alprazolam      | 1(0.23)         | -                             | Tablet 0.5 mg    | 1 tablet at HS x 3 days |
Table 4: Antihypertensive Drugs Prescribed for Cataract surgery cases (n= 424)

| Blood pressure     | No of cases | Drugs prescribed               |
|--------------------|-------------|--------------------------------|
| Borderline high    | 10          | No drugs                       |
| >140/90 mmhg       |             | Salt restriction               |
| >160/100 mmhg      | 18          | ACE inhibitors                 |
|                    |             | Calcium channel blockers       |
|                    |             | Beta blockers                  |
|                    |             | AT1 antagonist                 |
|                    |             | Statins                        |
| total              | 28(6.6%)    |                                |

Table 5: Antidiabetic Drugs Prescribed for Cataract surgery cases (n= 424)

| Postprandial blood suger | No of cases | Drugs prescribed |
|--------------------------|-------------|------------------|
| >140 mg/dl               | 4           | Insulin          |
|                          |             | Sulfonylureas    |
|                          |             | Biguanides       |
| 120-140mg/dl             | 6           | No drug          |
| Controlled borderline    | 10          | Diabetic diet     |
| index                    |             |                  |
| total                    | 10(2.35%)   |                  |

Discussion

Drug utilization research is 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 among patients undergoing cataract surgery.

Usual prescription pattern was one antibiotic, one antiinflammatory agent and one mydriatic-cycloplegic. In that mostly topical ophthalmic preparations were prescribed. Antibiotics which were prescribed were different types of fluoroquinolones, to prevent development of endophthalmitis. Fluoroquinolones are very effective against the causative organism of endophthalmitis. Norfloxacin is potent and cheapest antibiotic eye drop and it was the most frequently prescribed antibiotic preoperatively. Ofloxacin was most frequently prescribed during postoperative period. Moxifloxacilin is more potent newer fourth generation fluoroquinolone but because of its high cost it is rarely prescribed. Oral antibiotics were prescribed both preoperatively and postoperatively in few cases only.

Advantage of systemic antibiotic therapy remains controversial. Flurbiprofen was used as antiinflammatory analgesic agent and prevent development of cystoids macular oedema. Topical corticosteroids are the best antiinflammatory agents for ocular surgeries so it is routinely prescribed by ophthalmologist during both preoperative and postoperative period. Postoperatively in most of the cases antibiotic-corticosteroid combinations were given to prevent inflammation.

Tropiamide-phenylephrin combination eye drop was given preoperatively and postoperatively for inducing mydriasis in elderly while atropine ointment was given children for the same purpose. Acetazolamide, timolol and manitol were given preoperatively to decreased IOP in patients of raised IOP. Maximum drugs were prescribed in generic names only few were by brand names. Overall in most the cases the drugs were prescribed appropriate to their clinical needs, in rational combinations, in proper dosage forms and at proper frequency of administrations.

Conclusion

In our study overall rational prescription was found in maximum places. Data of this study can help the ophthalmologist to make appropriate revision in there prescribing practice. Prescribers can be trained in rational prescription to improve their prescription writing by conducting different Continuing Medical education programmes.

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