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PHARMACOEPIDEMIOLOGY OF DRUGS UTILISED FOR CATARACT SURGERY IN A GOVERNMENT HOSPITAL

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ABSTRACT

Drug utilisation research is an essential part of pharmacoepidemiology. To evaluate pharmacoepidemiology of drugs utilized for cataract surgery a retrospective study was conducted in department of ophthalmology in a Government Hospital in Southern region of Tamil Nadu. Data from case sheets of discharged patients after cataract surgery, available in Medical Record Section were collected and analysed. Utilisation pattern of drugs were audited. Price of prescribed drugs was evaluated for rationality towards cost effective prescription. For 695 cases of cataract surgery, drugs were prescribed pre, per and post operatively. Different antibiotic, antiinflammatory,mydriatic and cycloplegic agents were prescribed. Most commonly prescribed topical antibiotic was Tobramycin (44.89%) preoperatively and Tobramycin with Dexamethasone (50.93%) postoperatively. Most commonly prescribed mydriatic cycloplegic preoperatively was Tropicamide combined with phenylephrine (96.40%) and post operatively was Homatropine (1.43%). Low cost drugs were prescribed in generic names. Few abbreviations were used in directions. Prescription pattern was almost rational. The prescribed drugs were cost effective as most of them were supplied by Hospital store and the District Blindness control Society.

INTRODUCTION

Pharmacoepidemiology is the "Study of use and effect /side effects of drugs in a large number of people with the purpose of supporting rational and cost effective use of drugs in a society thereby improving health outcomes".It may be drug oriented emphasising safety and effectiveness of drug or utilisation oriented aiming to improve the quality of drug therap

Drug utilization is defined by WHO as "marketing, distribution,prescription and use of drugs in a society with special emphasis on resulting, medical, social and economic consequences".[1] Particularly they are useful in public health programmes to improve drug use and reduce expenses. It is necessary to evaluate the pattern of drug utilization from time to time[.2] As data regarding drug utilization study for inpatient department of ophthalmology were not available the present study was planned retrospectively aiming pharmacoepidemiogical analysis of drugs therapeutically prescribed for the patients admitted for cataract surgery in Government teaching Hospital

MATERIALS AND METHODS

Study design :

Single centre, retrospective ,observational study.

Study Centre :

Department of Ophthalmology – Medical Records Section – Govt. Rajaji Hospital, Madurai.

Study Period :

6 months.

Methodology :

Study material were case sheet of patients discharged after cataract surgery available in Medical record section. Screening of records for a period of 6 months from January 2011 to June 2011 was carried out. From the case sheets utilization pattern of prescribed drugs like dosage form, route , frequency of administration and duration of therapy were recorded. Collected datas were complied and analysed . Rationality in respect of drug prescription versus therapeutic indication was also evaluated. Price list was obtained from Central medical stores and District Blindness Control Society for the drugs supplied by them.

OBSERVATION:

The case sheets of 695 cataract cases .were screened. Patients aged above 40 years were 99.28 % and children below 8 years were 0.71 %. Extra Capsular Cataract Extraction (ECCE) by small incision cataract surgery was performed, followed by implantation of

intraocular lens in anterior or posterior chamber. Irrespective of implantation of intraocular lens, drugs were prescribed pre, per and post operatively for all cases.

Preoperative drugs:

Most frequently prescribed topical antibiotic was Tobramycin (44.89).Other antibiotics were Ciprofloxacin(31.22%),Gentamycin(22.15%), and Moxifloxacin(0.86%). Flurbiprofen (77.98%) was the commonly prescribed topical analgesic - anti-inflammatory drug,followed by Ketorolac(22.01).

Tropicamicide combined with Phenylephrine was the mydriatic –cycloplegic prescribed in 96.40% cases. For hypertensive patients only Tropicamide (2.87%) was prescribed. Atropine eye ointment (0.71) was prescribed for children Elderly patients with high intraocular pressure were treated with Acetazolamide(0.86%) orally&Timolol (0.86%) topically. Mannitol (0.28%) was used in addition to control intraocular pressure.

Intraoperative drugs:

Local anesthesia(xylocaine) for elderly patients and general anesthesia(propofol) for children was used to perform ECCE. Sub conjunctional injection of Gentamicin and dexamethasone were given at the end of operation for all cases (100%)

Postoperative drugs

The most frequently prescribed topical antibiotic was Tobramycin with dexamethasone(50.93%).Other drugs were Ciprofloxacin with dexamethasone(32.16%) and chloramphenicol with dexamethasone(18.56%).Oral antibiotics prescribed were Ciprofloxacin(99.28%) and Amoxicillin(0.72%).

Homatropine (1.43%) and Atropine eye ointment(0.71%) was the mydriatic prescribed in adults and children respectively.Brufen(99.28%) and Paracetamol (0.71%) were the analgesics prescribed .Patients with raised intraocular pressure were continued with Acetazolamide and Timolol for three days.T.Prednisolone and prednisone eye drops were prescribed in patients with active uveitis. . T.Diazepam (96.40%) was prescribed as an anxiolytic.

Among 29 drugs prescribed over three phases of cataract surgery 58.62% were supplied from hospital stores and 41.37% supplied by District Blindness Control Society. Few cases of cataract were found with Hypertension (2.87%) and Diabetes Mellitus (8.20%) Antihypertensive and Antidiabetic drugs were prescribed accordingly by the physician. No adverse effect was noted with use of all those drugs. After discharge the patients were prescribed topical antibiotic- steroid eye drops for 6-8 weeks.

DISCUSSION:

Pharmacoepidemiology is a powerful tool that can benefit patients and public health, but only if used appropriately. It is a research tool of global importance[3]WHO organises drug utilization research with goal towards rational prescription through some methods for auditing drug therapy[4]

The study was a part of prescription audit to rationalise the prescription from pharmacological point of view. So the prescriptions for cataract surgery were audited retrospectively. Usual prescription pattern was one antibiotic, one antiinflammatory and one mydriatic cycloplegic agent.

Topical antibiotic such as Aminoglycosides and fluroquinlones were prescribed before surgery as prophylaxis against endopthalmitis.. Fluroquinolones are potent synthetic agents having broad spectrum of activity,[5] Moxifloxacin, the more potent fluroquinolone was prescribed in rare situation because of its high cost. Oral antibiotic especially ciprofloxacin was prescribed in post operative period to prevent post operative ocular infection But their role remains controversial..

Flurbiprofen and Ketorolac were used preoperatively to counter unwanted intraoperative miosis during cataract surgery.[6] They also prevent Cystoid Macular Edema.

Post operative antiinflammatory coverage was given by topical corticosteroid, especially Dexamethasone combined with antibiotic.Oral anti inflammatory agent such as Ibuprofen was also prescribed along with Ranitidine. 1% Predinisolone eye drops which has the greatest antinflammatory action was prescribed along with oral prednisolone tablet in case of active uveitis.[7] Topical steroids were preferred as it avoids systemic side effects of steroids such as hyperglycemia, hypertension and gastrointestinal ulceration. Preoperatively steroids were not prescribed routinely. It was given only in cases when an inflammatory condition is expected to flare up.

The pupils must be dilated preoperatively for all types of ECCE to enable the surgeon to view the periphery of lens and thoroughly remove the cortex.[8] The pupils were dilated using a combination of Tropicamide and Phenlyephrine. Tropicamide without phenylephrine was prescribed for hypertensive patients as phenylephrine raises blood pressure by causing vasoconstriction [10.] Paediatric age group was prescribed with Atropine eye ointment for sustained mydriatic action. Systemic absorption may lead to facial flushing and hence ointment is preferred over drops in young children.[7] Homatropine eye drops was used post operatively in elderly.

The presence of increased intraocular pressure constitutes an anxiety in operating for cataract. The tension may be raised owing to swelling of lens. The intraocular pressure is reduced using T.Acetazolamide and Timolol eye drops. Mannitol is used as additive therapy when the oral agents are insufficient.[5] On the other hand in patients with persistent primary glaucoma, the medications were given both pre and post operatively

Intra operative Gentamicin and dexamethasone were injected as depot for prolonged antibiotic and anti-inflammatory coverage at the site of operative section. ECCE in hypertensive and diabetic patient was performed under proper control with anti hypertensives and antidiabetic drug prescribed maintaining the principles of rational prescription, and drugs for cataract surgery were modified accordingly. Thus chances of drug interaction became less.

Drugs prescribed in three phases of cataract surgery were safe and effective. Prescription was logical in respect to therapeutic indication. No adverse drug reaction was noted and there was no incidence of post operative ocular infection..Hospital store supplied cheapest drugs and the District Blindness control society supplied cheaper as well as costly drugs, which were prescribed in generic name. It was rational in respect of cost effectiveness and patients compliance. Government Hospital procure drugs as per standard government policy and tender procedures. The study concludes with overall impression of rational prescription in maximum place.

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PRE OPERATIVELY PRESCRIBED DRUGS FOR CATARACT SURGERY (Table-1)

Drugs	No of cases	Route and dosage form	Frequency and duration	Price (Rupees / Unit
Antibiotics:				
● Tobramycin 0.3%	312 (44.89%)	Eye drops	1 drop 4 times x 3 days	15.00 / 5 ml
■ ciprofloxacin 0.3%	217 (31.22%)	Eye drops	1 drop 6 times x 3 days	2.40/ 5 ml
■ Gentamicin 0.3%	154 (22.15%)	Eye drops	1 drop 6 times x 3 days	3.00/ 5ml
● Moxifloxacin 0.5%	6 (0.86%)	Eye drops	1 drop 3 times x 3 days	38.00/ 5ml
Analgesics:				
● Flurbiprofen 0.3%	542 (77.98%)	Eye drops	1 drop ½ hrly for 2 hours prior to Surgery	17.47 / 5 ml
● Ketorolac 0.5%	153 (22.01%)	Eye drops	1 drop 6 hrly 24 hours before surgery	25.25/ 5 ml
Mydiatic:				
● Tropicamide0.8% +Phenylephrine 5%	670 (96.40%)	Eye drops	1 drop every 10 minutes 1 hour before surgery	24.00 / 5 ml
● Tropicamide 1%	20 (2.87%)	Eye drops	1 drop every 10 minutes 1 hour before surgery	38.9/ 5 ml
● Atropine	5 (0.71%)	Ointment	Thrice daily x 3 days	2.20/5gm
Miscellaneous:				
● Timolol 0.5%	6 (0.86%)	Eye drops	1 drop 2 times x 1 day	15.00 / 5 ml
■ Acetazolamide	6 (0.86%)	Tablet 250 mg	1 tablet 3 times x 1 day	0.56/ tablet
■ Mannitol	2 (0.28%)	Infusion	150ml in 30 minutes before surgery	20.00/infusion

PER OPERATIVELY PRESCRIBED DRUGS FOR CATARACT SURGERY (Table-2)

Drugs	No of cases	Route and dosage form	Frequency and duration	Price (Rupees / Unit)
■ Local Anaesthetic (xylocacine)	690 (99.28%)	Peribulbar Injection		3.90 / vial
■ General Anaesthesia (propofol)	5 (0.71%)	Intravenous		
■ Gentamicin	695 (100%)	Sub conjunctional injection	Once at the end of surgery	3.00 / vial
■ Dexamethasone	695 (100%)	Sub conjunctional injection		3.00 / vial

POST OPERATIVELY PRESCRIBED DRUGS FOR CATARACT SURGERY (Table-3)

Drugs	No of cases	Route and dosage form	Frequency and duration	Price (Rupees / Unit)
Antibiotics (Topical):				
● Tobramycin + Dexamathoasone	354 (50.93%)	Eye drops	1 drop x 6 times x 3 days	7.35/5 ml
■ Ciprofloxain + Dexamathoasone	212 (32.16%)	Eye drops	1 drop x 6 times x 3 days	5.20/ 5 ml
● Chloramphenicol + Dexamathoasone	129 (18.56%)	Eye drops	1 drop x 6 times x 3 days	7.35/5 ml
Antibiotics (oral)				
■ Ciprofloxain	690 (99.28%)	Tablet 500 mg	Tablet twice daily x 3 days	1.00/ tablet
■ Amoxycilin	3 (0.43%)	Capsule 250 mg	1Capsule thrice daily x 3 days	1.0/capsule
■ Syrup amoxycillin	2 (0.28%)	Syurp	1 tsp twice daily x 3 days	10.00/30ml
Anaglesics:				
■ Brufen	690 (99.28%)	Tablet 400 mg	1 tablet twice daily x 3 days	0.25 /tablet
■ Paracetamol	5 (0.71%)	Tablet 500 mg	1 tablet twice daily x 3 days	0.25 /tablet

POST OPERATIVELY PRESCRIBED DRUGS FOR CATARACT SURGERY
(Table-3 continued)

Drugs	No of cases	Route and dosage form	Frequency and duration	Price (Rupees / Unit)
Mydriatic:				
■ Homatropine	10 (1.43%)	Eye drops	1drop Hs x 1 day	21.00/5 ml
● Atropine	5 (0.71%)	Ointment	Twice daily x 3 days	2.20/5 gm
Miscellaneous:				
■ Ranitidine	690 (99.28%)	Tablet 150 mg	1 tablet twice daily x 3 days	0.25/tablet
■ Diazepam	670 (96.40%)	Tablet 5 mg	1 tablet Hs x 3 days	0.25/tablet
■ Prednisolone	7 (1.07%)	Tablet 10 mg	1 tablet 2 times x 10 days	0.25/tablet
● Prednisolne	7 (1.07%)	Eye drops	1 drop 6 times x7days	30.00/5ml
● Timolol	6 (0.86%)	Eye drops	1 drop 2 times x 3 days	15.00/5ml
■ Acetazolamide	6 (0.86%)	Tablet 250 mg	1 tablet 3 times x 3 days	0.56/tablet

■ Drugs supplied by Central Medical Store

■ Drugs supplied by District Blindness control Society.