

Drug use in Ophthalmology out-patient Department: A Prospective study at a Tertiary Care Teaching Hospital

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ABSTRACT

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Objective: The present study was undertaken with the aim to study the drug use pattern in ophthalmology out-patient department and to evaluate the drug use for rationality with the help of WHO core drug prescribing indicators and other prescribing parameters. **Materials and methods:** The study was carried out at ophthalmology out-patient department of a tertiary care teaching hospital. Total 647 patients were included during the study period of six months. The data was collected in a proforma which included the patients' details and the prescriptions details. **Results:** Prescription analysis showed that the average number of drugs per prescription was 2.23. The maximum number of drugs prescribed, were in the form of eye drops (75.34%), followed by tablets (15.02%), ointments (5.54%), capsules (3.53%), syrups (0.34%), gels (0.13%) and injections (0.10%). Dosage formulation, frequency and duration of therapy recorded were mentioned in 99.7%, 98.97% and 97.44% of prescriptions respectively. The number of antibiotics which were prescribed was 385 (59.50%). The number of patient encounters with anti-inflammatory drugs 130 (20.09%), anti-glaucoma drugs 127 (19.62%), mydriatics 107 (16.53%), artificial tears 89 (13.75%), ocular decongestants 78 (12.05%), steroids 61 (9.42%), anti-histaminic drugs were 60 (9.27%), and those with multi-vitamins were 19 (2.93%).

Conclusion: The common prescription writing errors such as duration of therapy, frequency of administration and dosage form were low. This study shows less polypharmacy, use of injections was limited and majority of the drugs were prescribed from the hospital formulary drug list. However prescribing by generic name was very low.

Keywords: Drug use pattern, WHO core drug prescribing indicators, Polypharmacy, Generic name

INTRODUCTION

Optimum management of ocular disease has large impact in prevention of loss of vision in patients suffering from eye problems. Appropriate management of these patients reduces the burden of the ocular health problems.¹ Drug utilization pattern needs to be evaluated regularly to increase therapeutic efficacy, decrease adverse effects and also to assess whether drug therapy is rational or not.² Previously only few studies were conducted to study drug use pattern in ophthalmology in India. Therefore the present study was conducted to study the drug use in ophthalmology and to evaluate its rationality with WHO core drug prescribing indicators.³

MATERIALS AND METHODS:

This study was carried out at the out-patient department of a tertiary care teaching Ophthalmology hospital. The hospital satisfies the healthcare needs of millions of patients of

Ahmedabad city and patients coming from surrounding areas.

In this prospective study, data were collected twice weekly on Monday and Thursday during the period from March 2008 to August 2008. Approval was obtained from Institutional Ethics Committee before starting the study. The data were collected from patients of all age groups and from either sex, who visited the ophthalmology out-patient department of the hospital. All the new cases with drug prescription were included in the study. Patients with follow up cases and patients who were not prescribed any drug but undergo other interventional procedures were not included in the study. Patients who were not willing to give information were also excluded from the study. After taking the verbal consent from patients and/or patient's relatives, data were collected from the patient's case paper. The proforma for data collection includes patient's demographic details, provisional diagnosis/diagnosis, chief complaints and complete drug prescription.

Many of the drugs were prescribed by their brand names. The generic name of the drugs and the generic contents of each formulation were obtained from the commercial publications like Indian Drug Review and Monthly Index of Medical Specialties 2008. Information regarding the drugs and

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formulations not mentioned in these publications was obtained from the local pharmacy stores or hospital pharmacy. A list of drugs available in hospital formulary is obtained to find out drugs prescribed from hospital formulary.

Finally, the analysis was done for demographic characteristics, morbidity pattern, drug use pattern Drug use pattern was assessed by the following indicators ; Most frequently prescribed drug groups, most frequently prescribed drug, percentage of prescription with fixed dose combinations, most frequently prescribed FDC, percentage of drugs for which dosage formulation, frequency, and duration of therapy recorded and percentage of different dosage formulation prescribed and WHO core drug prescribing indicators (Average number of drugs per prescription, percentage of drugs prescribed by generic name, percentage of encounters with an antibiotic prescribed, percentage of encounters with an injection prescribed, percentage of drugs prescribed from essential drugs list or formulary).³

Data of all the patients were analyzed with the help of using Microsoft Excel version 2007. All parameters were expressed in percentage.

RESULTS

Total 647 patients were included during the study period. Out of this 378 were males and 269 were females. The age of the patients ranged from 0.6 yr to 88 yr.

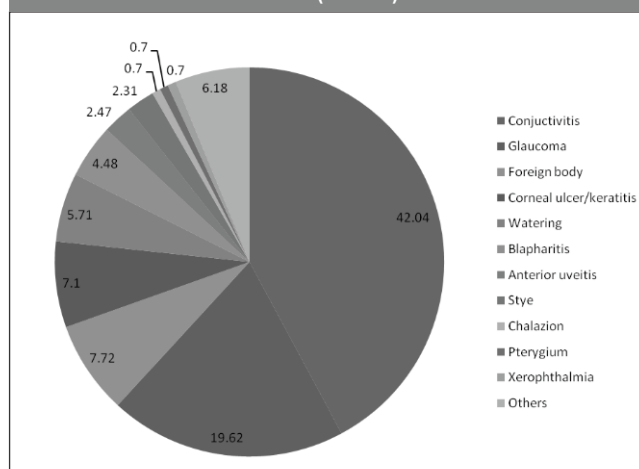
Conjunctivitis (42.04%) was the most common disease condition in the patients attending the OPD. Glaucoma (19.62%) was the second most common condition, followed by foreign body in the eye (07.72%) and corneal ulcer/keratitis (07.10). (Fig.1)

Total drugs prescribed in the 647 patients were 1444. Antimicrobial agents were the most commonly prescribed drugs in 385(59.50%) of the patients. NSAIDS (20.09%) was the second most common drug prescribed, while antiglaucoma medications (19.62%) were at third position. (Table 1) Most frequently prescribed drug was ofloxacin (48.68%), followed by the Timolol (16.22%), Nephazoline (12.05%) and Tobramycin (11.43%). (Table 2)

Out of total 647 patients 280 (43.27%) patients were prescribed FDCs. Ibuprofen and paracetamol was the most frequently prescribed FDCs. (Table 3)

Dosage formulation, frequency and duration of therapy recorded were mentioned in 99.7%, 98.97% and 97.44% of prescriptions respectively. Eye drops were the most commonly prescribed dosage formulation, while injections were the least commonly prescribed dosage formulation. (Table 4)

Fig.1: Morbidity pattern in patients attending ophthalmology OPD (n =647)



*Patients with cataract, refractory errors and squint who were usually not prescribed any drug in OPD are not included in the study

Table 1: Most frequently prescribed drug groups

Sr.n	Prescribed drug group	No. of patients (n=647)	Percentage
1	Antimicrobial agents	385	59.50
2	NSAIDS	130	20.09
3	Antiglaucoma drugs	127	19.62
4	Mydriatics	107	16.53
5	Artificial tear	89	13.75
6	Ocular decongestants	78	12.05
7	Steroids	61	09.42
8	Anti-histamines	60	09.27
9	Vitamins and minerals	19	02.93
10	Herbal drugs	04	00.06

* Some patients received more than one drug, and therefore the total percentage exceeds 100%

Table 2: Most frequently prescribed drugs

Sr.n	Prescribed drug	No. of patients (n=647)	Percentage
1	Ofloxacin	315	48.68
2	Timolol	105	16.22
3	Nephazoline	78	12.05
4	Tobramycin	74	11.43
5	Ibuprofen	69	10.66
6	Paracetamol	66	10.20
7	Chlorpheniramine	55	8.50
8	Ketorolac	49	7.57
9	Cyclopentolate	46	7.10
10	Carboxymethylcellulose	41	6.33

* Some patients received more than one drug, and therefore the total percentage exceeds 100%

WHO has suggested five core prescribing indicators to evaluate the rationality of drug use. (Table 5)

Table 3: Most frequently prescribed Fixed dose combinations (FDCs)

Sr.n	FDC	No. of patients (n=647)	%
1	Ibuprofen+ paracetamol	66	10.20
2	Nephazoline+chlorpheniramine	55	08.50
3	Ofloxacin+ketorolac	39	06.02
4	Ofloxacin+dexamethasone	26	04.01
5	Fluometholone+tobramycin	23	03.55

Table 4: Dosage formulations prescribed

Sr.n	Dosage Formulation	No. of patients (n=1444)	%
1	Eye drop	1088	75.34
2	Tablet	217	15.02
3	Ointment	80	5.54
4	Capsule	51	3.53
5	Syrup	5	0.34
6	Gel	2	0.13
7	Injection	1	0.10

Table 5: WHO core drug prescribing indicators

Sr.n	Indicators	Value
1	Average number of drugs per prescription (encounter)	2.23
2.	Percentage of drugs prescribed by generic name	01.14
3.	Percentage of encounters with an antibiotic prescribed	59.50
4	Percentage of encounters with an injection prescribed	00.10
5	(a)Percentage of drugs prescribed from essential drugs list	61.84
	(b)Percentage of drugs prescribed from hospital formulary drug list	81.27

DISCUSSION

The irrational use of the drug is a common occurrence throughout the world.¹⁴ Drug utilization studies are very helpful in promoting the rational use of drugs in population. WHO core drug prescribing indicators, patient care indicators and health facility indicators may be use as a pointer towards irrational drug use.

Morbidity pattern seen in our study was the typical morbidity pattern that was seen in the ophthalmology OPD across the India.⁵ Infective conditions of the eye were the most common disease in this study in 56% of the total patients. Most common infective disease condition was conjunctivitis in 42% of the total patients. Infectious diseases of the eye are common in India because of the poor sanitation.⁶

In our study most frequently prescribed drug group was antimicrobial agents (59.50%). The most frequently prescribed antimicrobial was ofloxacin (48.68%), which was also the most commonly prescribed drug in this study. This was according to the morbidity pattern which has higher number of cases of the infective conditions of the eye. Fluroquinolones are initially the first choice of drug for empirical therapy of bacterial conjunctivitis which justify the use of ofloxacin in this study.⁷ Fluroquinolones were the most frequently prescribed antibiotics, also shown by previous studies.⁸⁻¹⁰ NSAIDs (20.09%) were the second most prescribed drug group and ibuprofen (10.66%) was the most frequently prescribed NSAID. This was because inflammation is usually associated with infectious condition of eye and inflammatory diseases of eyelids are also common. Other drug groups like anti-glaucoma medications (19.62%), mydriatics (16.53%), artificial tears (13.75%), ocular decongestants (12.05%), corticosteroids (9.42%), antihistamines (9.27%), vitamins (2.93%) and herbal drugs (0.06%) show the reflection of the morbidity pattern seen in ophthalmology. In a previous study done at Jammu, antimicrobial agents (32%), anti-inflammatory agents (11%), mydriatics (7%), vitamins (7%) were lower than our study.⁹

In our study fixed dose combinations (FDCs) were prescribed in 43.27% of the patients. This shows increasing use of FDCs in modern ophthalmic practice. Ibuprofen plus paracetamol tablet (10.20%) was the most frequently used FDC, followed by the nephazoline plus chlorpheniramine (8.50%) eye drop, ofloxacin plus ketorolac (6.02%) eye drop and ofloxacin plus dexamethasone (01%) eye drop. FDCs have certain drawbacks like dose cannot be individualized for the drugs used in the combination and drugs with different pharmacokinetic patterns cannot be combined. So it should be used only when it is necessary. Otherwise inappropriate use of the FDCs can lead to increased adverse drug reactions and increased financial burden to the patients.¹¹

Drugs for which dosage formulation, frequency of administration and duration of therapy recorded were 99.70%, 98.97% and 97.94% respectively. Similar pattern was seen in previous study done at Karnataka.¹⁰ This shows good knowledge of the ophthalmologists of institute regarding drug and drug prescribing. If the dosage formulation, frequency of administration and duration of therapy is not recorded for any drug, this can lead to indiscriminate and injudicious use of drugs.¹¹ In the study done at New Delhi, drugs for which dosage formulation, frequency of administration and duration of therapy recorded was 95.40%, 77.90% and 26.40% respectively, which were less than our study.¹²

Most frequently prescribed dosage formulation were eye drops in 75.34% of the patients, followed by the tablet (15.02%), ointment (5.54%), capsules (3.53%), syrup (0.34%), gel (0.13%) and injections (0.1%). Studies done at New Delhi, Jammu and Karnataka also had eye drops at the top of the list.^{12, 9, 10} This shows most of the drug used in our study were topical preparations. Use of drugs by topical route can minimize the adverse drug effects that can occur with the use of systemic administration of the drug.

WHO core drug prescribing indicators measures the performance of health care providers in several key dimensions related to the appropriate use of drugs in outpatient setting.³ Average number of drugs per prescription is a good indicator for the polypharmacy. As per WHO the average number of the drugs per prescription should be 1.6 to 1.8.¹³ This was 2.23 here which show polypharmacy. Earlier study done at New Delhi reported higher number of drug per prescription (3.03), while studies done at Jammu (1.87%) and Karnataka (2%) show lower number of drugs per prescription than our study.^{12, 9, 10} Number of drug per prescription should be kept to minimum otherwise it can lead to increase in adverse reactions and drug interactions, increased treatment cost and increase in prescribing error.¹⁴⁻¹⁶

Percentage of drugs prescribed by generic name was only 1.04% in our study. This shows greater tendency to prescribe drug by brand name and influence of the pharmaceutical companies over prescribers. Prescription by the generic name could facilitate cheaper treatment for the patients. The study at Jammu and Karnataka had similar prescription by generic names (1%), while study at New Delhi reported higher percentages (35%) of prescription by generic names than this study.^{9, 10, 12}

Percentage of encounters with an antibiotic prescribed was 59% in our study, which was higher compared to study done at New Delhi, Jammu and Karnataka which showed 34%, 32% and 30.18% of prescribed antibiotics respectively, and antibiotic prescription was higher over here.^{12, 9, 10} It may be due to higher prevalence of the infective diseases of the eyes in our area. (56%) So antibiotics prescribed here are appropriate according to morbidity pattern. A higher prescription of antibiotics than infective conditions may be because patient's demand for rapid relief from the disease, empirical antibiotic therapy and over estimating the disease severity.^[17] Irrelevant use of the antibiotics can lead to the increased adverse events and increased chance of the bacterial resistance to the antimicrobial agents.¹⁸

Percentage of encounters with an injection prescribed was only 0.01%, which was only one prescription with injection of multivitamins. Use of the injection should be limited because it can cause local toxicity and also increase the risk of the toxicity and overall cost of the treatment for the patients.^[11]

CONCLUSION

Complete prescription should include Patient's name, age, sex, diagnosis, dose, dosage form, frequency of administration, duration of therapy. In this study all this information was recorded in the majority of the patients. Evaluation of the drug use with the help of WHO core drug prescribing indicators showed that at our institute polypharmacy is less, use of injections was limited and majority of the drugs were prescribed from the hospital formulary drug list. However prescribing by generic name was very low and use of the antibiotic was somewhat high, which should be improved. So overall findings of this study suggest, that drug prescribing habits of ophthalmologists of our institute are appropriate to a large extent. There is need to conduct many such studies at regular interval at our institute and also at other institutes across the India. This is useful for auditing large number of prescriptions to find out early signals of the irrational drug use. Such study should be followed by education of the prescribers on rational drug therapy for benefits and safety of the patients.

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