

Prescribing pattern in ophthalmological outpatient department of a tertiary care teaching hospital in Dehradun, Uttarakhand: a pharmaco-epidemiological study

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ABSTRACT

Background: Irrational prescribing is a common phenomenon, seen among medical practitioners. Knowledge, awareness, and attitude denote the practicing trends among the practitioners. The objective of this study was to describe the prescribing practices in Ophthalmology outpatient department (OPD) to promote rational prescribing.

Methods: This study was conducted between January 2011 to June 2011, in Department of Pharmacology and Ophthalmology, SGRRIM and HS, Dehradun, Uttarakhand. A total number of 255 prescriptions were randomly collected from the Ophthalmology OPD and were analyzed for various parameters using national essential medicine list 2011 and World Health Organization drug use indicators.

Results: A total number of 255 prescriptions were evaluated for prescribing pattern, 153 (60%) patients were between 16 and 45 years of age, the male: female ratio was 1.13:1. 237 (93%) patients from middle socioeconomic status. Diseases pattern observed were conjunctivitis 102 (40%), refractive error 45 (17.64%), styte 12 (4.7%), cataract 9 (3.52%), and miscellaneous 87 (34.12%). One hundred and thirty-eight (54.11%) patients received antimicrobial agents, fluoroquinolone (ofloxacin, moxifloxacin, gatifloxacin, etc.) were the most frequently prescribed antimicrobial drugs, analgesics (diclofenac and ketorolac) were prescribed to 45 (17.64%) patients, 54 (21.17%) received steroids (dexamethasone and prednisolone), 96 (37.64%) patients received other drugs (carboxymethylcellulose [CMC], multi-vitamins, zinc preparations, acyclovir, and anti-allergics). Fixed dose combinations (FDCs) were used in 90 (35.29%) patients, the most common combination was antimicrobials with steroids. All the drugs were prescribed by brand names and 1.9 drug/prescription was used.

Conclusion: Topical antimicrobial agents are the most commonly used drugs in ophthalmic OPD in our setup; the most common FDCs prescribed were antimicrobials with steroids, the other commonly used drugs were analgesics, CMC and anti-allergic drugs.

Keywords: Pharmaco-epidemiology, World Health Organization drug use indicator, Essential medicine list

INTRODUCTION

The World Health Organization (WHO) has defined drug utilization research as the marketing, distribution, prescription and use of drugs in a society, with special emphasis on the resulting medical, social, and economic consequences.¹ It is an essential part of pharmaco-epidemiology which describes the extent, nature, and determinants of drug exposure with the ultimate goal to facilitate rational use of drugs in the population.² Irrational

and inappropriate use of drugs in health care system observed globally is a major concern.^{3,4} In the recent past influx of newer therapeutic agents and tendency to prescribe the newer drugs more often is a concern.^{5,6} Antibiotics are widely prescribed for various ophthalmic diseases. Evidences have shown trends of resistance to a different class of antibiotics often used in ocular therapeutics.⁷ Indiscriminate use of topical antibiotics and nonsteroidal anti-inflammatory drugs cause histological and structural changes in conjunctiva.⁸ In order to improve

drugs therapeutic efficacy, minimize adverse effects, and delay development of resistance, drug utilization trends and patterns need to be evaluated periodically.⁹ Therefore, this study was undertaken with the aim to investigate drug utilization and prescribing practices of ophthalmologists in a tertiary care teaching hospital in Dehradun, Uttarakhand.

Objectives

The aim was to study the prescribing pattern in ophthalmology outpatient department (OPD) of a tertiary care teaching hospital and use it as a tool to promote rational prescribing.

METHODS

This study was conducted between January 2011 to June 2011, in Department of Pharmacology and Ophthalmology, SGRRIM & HS, Dehradun, Uttarakhand. Prior to the commencement of study, approval from Institutional Ethics Committee and written informed consent was taken from all the participants. A total number of 255 prescriptions were randomly collected from the ophthalmology OPD and were analyzed for various parameters using national essential medicine list (NEML) 2011 and the WHO drug use indicator.

The recorded forms were used to analyze on various parameters were: drug route, dosage form, indications for which prescribed, average number of drugs per prescription, number of encounters with antibiotics, percentage of drugs prescribed by generic name and drugs prescribed from NEML 2011.

RESULTS

During the study period, a total of 255 prescriptions were analyzed. The demographic profile of patients was charted according to their age, gender, and socioeconomic status. In 0-5 years of age group 3 female patients, 6-15 years 15 male and 9 female patients, in 16-45 years 87 male and 66 female patients and >46 years 33 male and 42 female patients were included (Table 1). The male patients were 53%, and female patients were 47% (Table 1). 237 (93%) patients were from middle socioeconomic status and 18 (7%) patients belonged to lower socioeconomic status (Table 1).

The disease pattern in eye OPD was analyzed. 102 (40%) patients suffered from conjunctivitis followed by refractive error 45 (17.64%), sty 12 (4.7%), diabetic retinopathy 12 (4.7%), cataract 9 (3.52%), keratitis 9 (3.52%), meibomitis 9 (3.52%), pseudophakia 9 (3.52%), dacrocystitis 6 (2.35%), blepharitis 6 (2.35%), corneal ulcer 6 (2.35%), chalazion 3 (1.8%), foreign body 3 (1.8%), corneal cyst 3 (1.8%), subconjunctival hemorrhage 3 (1.8%) and others 18 (7.06%) (Figure 1).

Table 1: Demographic profile of patients in eye OPD.

Items	Number/percentage
Male: female	1.13:1 (53:47)
Age (years)	
0-5	3 (1.18)
6-15	24 (9.41)
16-45	153 (60)
>46	75 (29.41)
Socioeconomic status	
Higher	-
Middle	237 (93)
Lower	18 (7)

OPD: Out-patients department

A total of 423 drugs were prescribed in 255 patients. 138 (54.11%) were antibiotics, followed by 54 (21.17%) steroids, 45 (17.64%) analgesics, 27 (10.59%) CMC, 15 (5.88%) multivitamins, 9 (3.53%) anti-allergics, 6 (2.35%) acyclovir, 6 (2.35%) zinc sulfate, 33 (12.94%) other drugs were prescribed. A total of 90 (35.29%) fixed dose combinations (FDCs) were prescribed (Figure 2).

Disease wise distribution of drugs was done. In conjunctivitis, 159 drugs were prescribed, which included 81 (50.94%) antibiotics, 6 (3.77%) analgesics, 36 (22.64%) steroids and 36 (22.64%) drugs in others category. In refractive errors, 21 drugs were prescribed; 6 (28.57%) drugs from antibiotics and 15 (71.43%) drugs from others category. In cataract, 24 drugs were prescribed, which included 6 (25%) antibiotics, 6 (25%) analgesics, 6 (25%) steroids and 6 (25%) drugs from others category. In sty 21 drugs were prescribed including 12 (57.14%) antibiotics and 9 (42.86%) analgesics. In the miscellaneous category, 108 drugs were prescribed, 33 (30.56%) antibiotics, 24 (22.22%) analgesics, 12 (11.11%) steroids, and 39 (36.11%) drugs from others category were prescribed (Figure 3).

Amongst topical eye drops, most frequently prescribed antibiotic was tobramycin eye drops in 27 (19.56%), followed by gatifloxacin 26 (18.84%), ofloxacin 24 (17.39%), moxifloxacin 16 (11.59%), ciprofloxacin 11 (7.97%) and sulfacetamide 11 (7.97%). Among ointments, neomycin 7 (5.07%) followed by ciprofloxacin 4 (2.89%) and Acyclovir 2 (1.44%) were prescribed. Among oral preparations, cefuroxime axetil tablet in 8 (5.79%) followed by ofloxacin in 2 (1.44%) and acyclovir tablet in 1 (0.7%) patient were prescribed (Figure 4).

Number of drugs prescribed in a particular disease per patient in few common conditions were estimated. 39 (38.24%) conjunctivitis patients were prescribed a single drug and 63 (61.76%) were given 2 or more drugs. Among refractive errors, 36 (80%) patients were not prescribed any drug and 9 (20%) patients were given 2

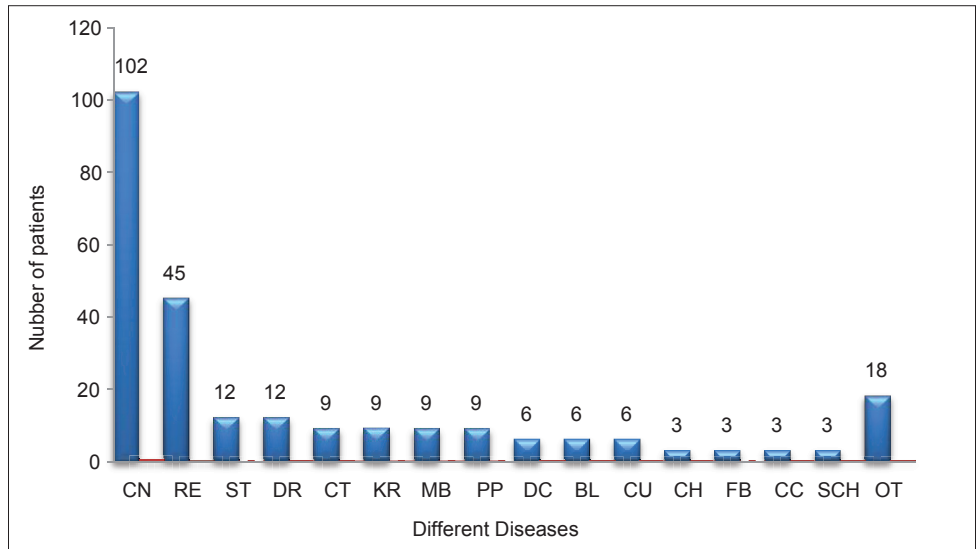


Figure 1: Disease pattern in eye outpatient department. CN: Conjunctivitis, RE: Refractive errors, ST: Stye, DR: Diabetic retinopathy, CT: Cataract, KR: Keratitis, MB: Meibomitis, PP: Pseudophakia, DC: Dacrocystitis, BL: Blepharitis, CU: Corneal ulcer, CH: Chalazion, FB: Foreign body, CC: Corneal cyst, SCH: subconjunctival haemorrhage, OT: Others.

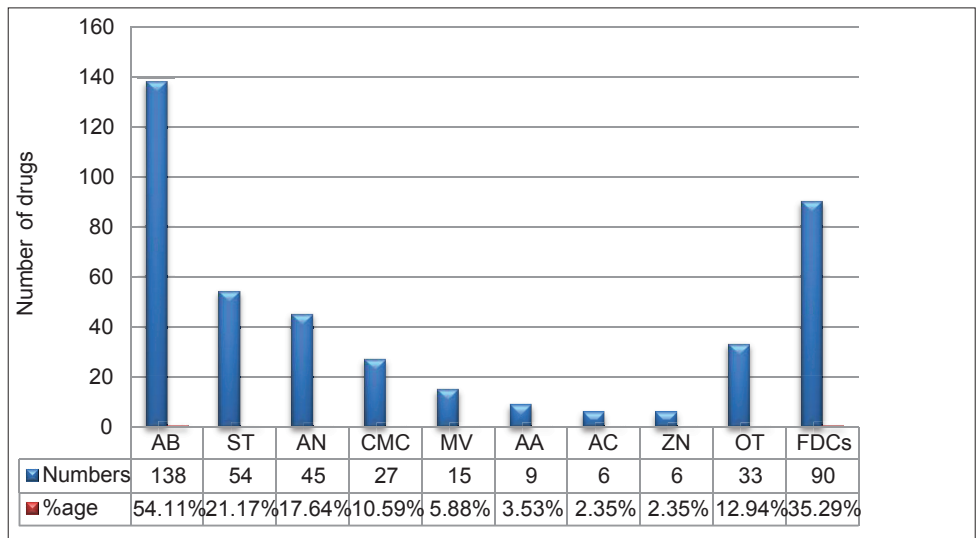


Figure 2: Drug prescribing pattern in eye outpatient department. AB: Antibiotics, ST: Steroids, AN: Analgesics, CMC: Carboxymethylcellulose, MV: Multivitamins, AA: Antiallergics, AC: Acyclovir, ZN: Zinc sulphate, OT: Others, FDCs: Fixed dose combinations.

or more drugs. For cataract patients 9 (100%) received 2 or more drugs and 12 (100%) stye patients received 2 or more drugs. Among patients in the miscellaneous category, 27 (30%) received 1 drug and 63 (70%) were given 2 or more drugs (Figure 5). Overall number of drugs/prescription were also evaluated. No drug was prescribed in 36 (14.12%), 1 drug in 66 (25.88%), 2 drugs in 53 (20.78%), 3 drugs in 88 (34.51%) and 4 drugs in 12 (4.71%) prescriptions respectively (Figure 6).

Out of 423 drugs prescribed, 69 (16.31%) drugs were prescribed from NEML 2011, which included 26 (37.68%) ofloxacin, 20 (28.98%) ciprofloxacin, 12 (17.39%) sulfacetamide, 7 (10.14%) neomycin, and 4 (5.79%)

Table 2: Drugs prescribed in eye OPD from national essential medicine list 2011.

Drugs prescribed from EML	Number/percentage
Ofloxacin	26 (37.68)
Ciprofloxacin	20 (28.98)
Sulfacetamide	12 (17.39)
Neomycin	7 (10.14)
Acyclovir	4 (5.79)

OPD: Out-patients department, EML: Essential medicine list

acyclovir (Table 2). All drugs were prescribed by their brand names and 1.9 drugs were prescribed per prescription.

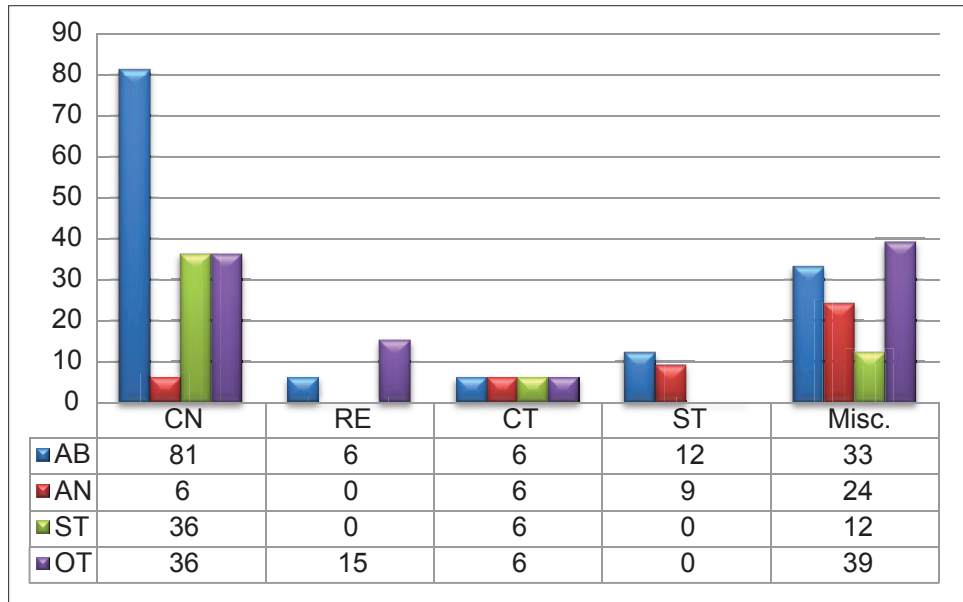


Figure 3: Disease wise drug use pattern in eye outpatient department in few common diseases. CN: Conjunctivitis, RE: Refractive errors, CT: Cataract, ST: Stye, Misc: Miscellaneous, AB: Antibiotics, AN: Analgesics, ST: Steroids, OT: Others.

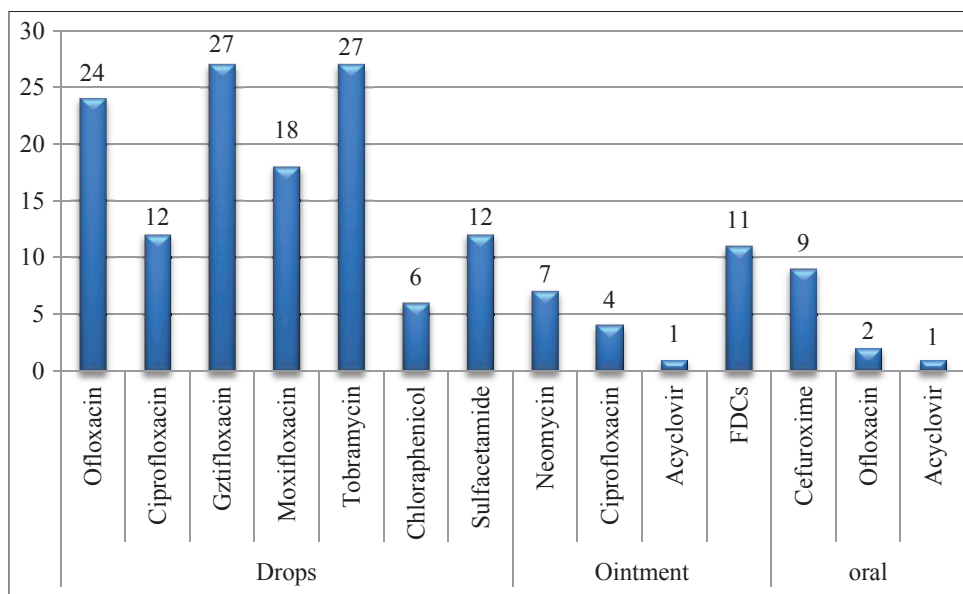


Figure 4: Common antimicrobials prescribed in eye outpatient department and their dosage forms.

DISCUSSION

Drug utilization studies are important for obtaining data about the patterns and quality of use, the determinants of drug use, and the outcomes of use. The WHO drug use indicators are highly standardized and are recommended for inclusion in drug utilization studies.^{1,2} The present study attempts to describe the current prescribing pattern and drug utilization with the WHO core prescribing indicators in ophthalmology OPD.

A total number of 255 prescriptions were analyzed in the study period. Majority of the patients 153 (60%) patients were in 16-45 years age group. The male patients were

53%, and female patients were 47%, which was consistent with previous studies.¹⁰ Morbidity pattern in our study was typical seen in ophthalmology OPD across country.¹¹ Most common infective disease observed in the present study was conjunctivitis 102 (40%). Infectious diseases of the eye are common due to poor sanitation. This finding was consistent with previous studies.^{10,12}

In this study, the most commonly prescribed topical drugs were antibiotics 54.11%, the result was consistent with a previous study where 59.5% of prescribed drugs were antibiotics.¹⁰ Fluoroquinolones (ofloxacin, ciprofloxacin, moxifloxacin) were the most commonly prescribed antibiotics 55.79% in this study

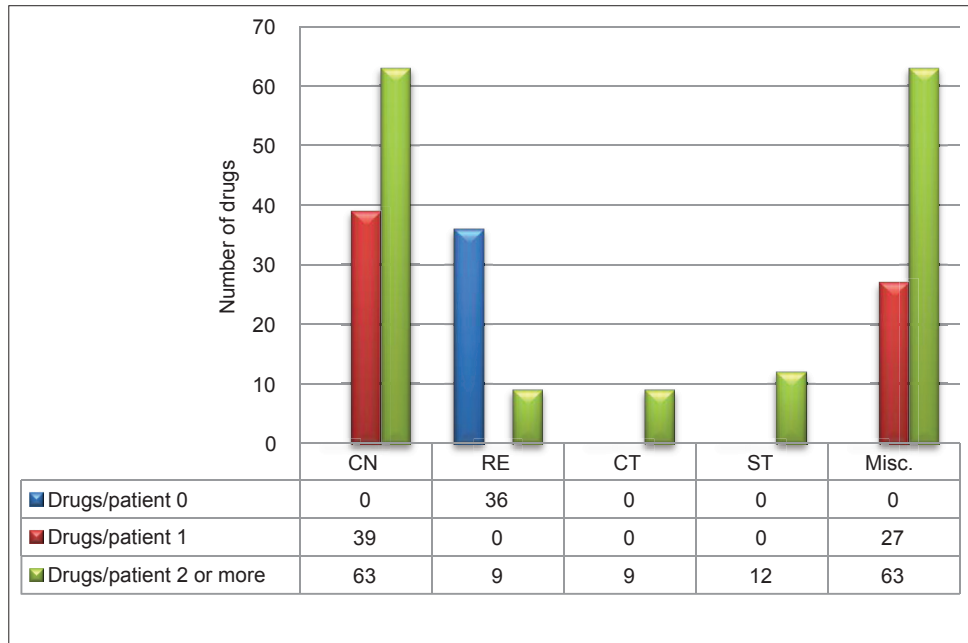


Figure 5: Number of drugs prescribed/patient in eye outpatient department in few common diseases. CN: Conjunctivitis, RE: Refractive errors, CT: Cataract, ST: Sty, Misc: Miscellaneous.

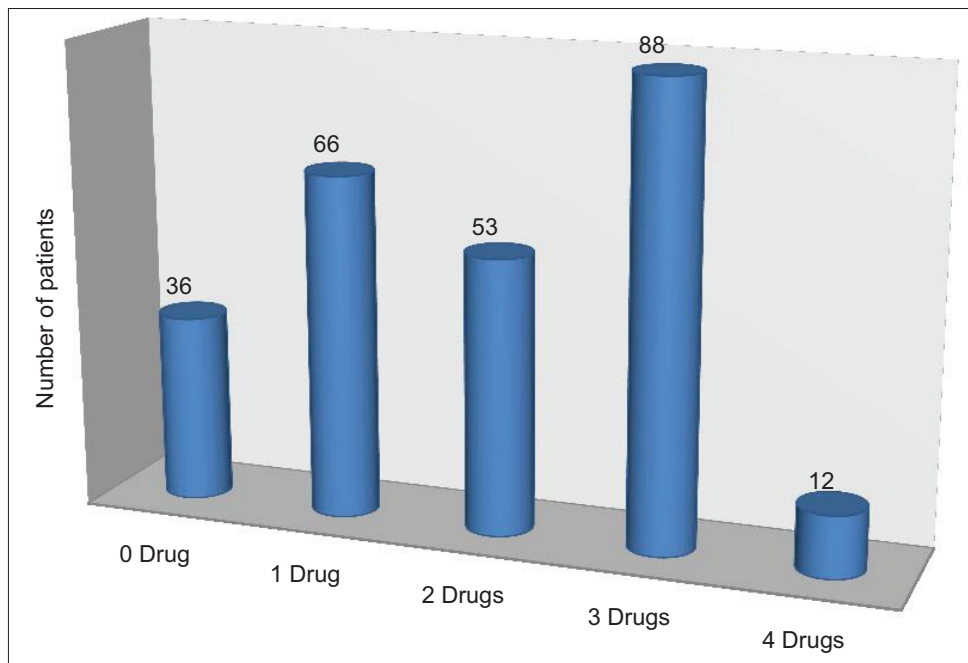


Figure 6: Number of drugs/prescription prescribed in eye outpatient department.

which was comparable with other studies.^{13,14} Fluoroquinolones are initially the first choice of drug in bacterial conjunctivitis, which justifies their use in this study.¹⁵ Other prescribed antibiotics were tobramycin in 19.56% and sulfacetamide 7.97%. Besides antibiotics, a total of 21.17% steroids and 17.64% analgesics were prescribed. Inflammation is associated with infection of the eye for which use of analgesics and steroids is justified. This was comparable with the previous study.¹⁰ 37.64% patients received other drugs (CMC, multi-vitamins, zinc preparations, acyclovir and anti-allergics).

In this study, a total of 35.29% FDCs were prescribed. The use of FDCs was comparable to other study where 43.27% FDCs were prescribed Prajapati and Yadav.¹⁰ FDCs have certain drawbacks, like dose cannot be individualized for the drugs used in combination and drugs with different pharmacokinetic patterns cannot be combined. Hence, they should be used only when necessary. Inappropriate FDCs create un-necessary adverse drug reactions and financial burden on the patients.¹⁶

WHO core drug prescribing indicators measure the performance of health care providers in several key dimensions-related to the appropriate use of drugs in outpatient setting.⁹ Average number of drugs per prescription is a good indicator of polypharmacy. As per WHO, the average number of drugs per prescription should be 1.6 to 1.8. Average number of drugs prescribed per prescription was 1.9 in this study, which was lower than other studies Biswas et al. 3-5 drugs/prescription, Gangwar et al 2.69 drugs/prescription.^{17,18} This demonstrated a restraint on over prescribing and polypharmacy to avoid risk of drug interactions. Of 423 drugs, only 16.31% drugs were prescribed from EML 2011, which was consistent with previous studies where 19.48% of drugs prescribed from NEML.¹⁹ All drugs were prescribed by their brand names in this study. This was comparable with other studies where most of the drugs were prescribed by brand names,^{17,20} which shows inclination of prescribers towards branded agents. However, prescribing drugs by generic name makes the treatment low cost and rational as it avoids prescription writing errors and confusion of dispensing of different brand names, which sound alike and spell similar.^{19,21}

Limitation

It was a quantitative type of drug utilization study with WHO core prescribing indicators and therefore determining the quality of diagnosis, and the appropriateness of drug choices was beyond the scope of prescribing indicators.

CONCLUSION

Evaluation of drug use using WHO core prescribing indicators show that the incidence of polypharmacy was less in this study. However, the study showed ample scope for improvement in encouraging the ophthalmologists to prescribe the drugs by generic names and selection of drugs from NEML. The use of antibiotics was also very high in this study. There is a need to conduct many such studies at regular intervals all across the country, which should be followed by education of the prescribers on rational drug therapy for benefits and safety of the recipients.

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Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

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