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Drug utilization study in post cataract surgery patients in a tertiary care hospital

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ABSTRACT

Background

Cataract is the major preventable cause of blindness. In India 50-80% of blindness is due to cataract. Recent data from World Health Organization (WHO) shows 25% decrease in blindness prevalence in India. Cataract surgery has been viewed as one of the most cost effective health interventions with a cost of disability adjusted life years saved each year being 20-40 $ (1200-1800 Indian Rs). There has been a substantial rise in cataract surgeries in recent years leading to increased utilization of drugs. Studies about pattern of drugs used in cataract patients are sparse in India. Hence the above study was taken up.

Objective

To analyze drug utilization in post cataract surgery patients based on WHO indicators.

Materials and methods

Across-sectional, observational study was conducted over a duration of 6 months at department of ophthalmology, Minto Eye Hospital, Bengaluru. A total of 110 prescriptions were analyzed who visited in-patient department. The data was analyzed by descriptive statistics.

Results

A total of 110 prescriptions were analyzed which included 431 drugs. Average number of drugs per prescription was 3.91, among which five drugs per prescription were maximum (41%). Majority of the drugs prescribed were in the form of eye drops (65.08%) and the commonest FDC eye drops prescribed being ciprofloxacin with dexamethasone (13.68%). Percentage of prescription with antibiotic is (52%) and injections were (0.89%). About (94.54%) of the drugs were prescribed by brand name and only (5.4%) by generic name. Percentage of drugs prescribed from essential drug list (72.92%). Commonly prescribed drugs were Antimicrobials (52%), Analgesic (23%), Steroid (7%), FDCs (10%), Mydriatics (4%) and others (4%).

Conclusion

Topical drugs were commonly prescribed to treat ocular infections. Evaluation of drugs using WHO core prescribing indicators showed that the number of drugs prescribed by generic names and from NLEM was low.

Keywords: Drug Utilization, Cataract, Core indicators, WHO, Generic names.

INTRODUCTION

Cataract is the worldwide leading cause of blindness and the most prevalent ocular disease. In India, cataract has been reported to be responsible for 50-80% of the bilaterally blind in the country. [1, 2, 3, 4] The most recent estimates from World Health Organization (WHO) reveal that 47.8% of global blindness is due to cataract; and in south Asia region which includes India, 51% of blindness is due to cataract.[5] In India, cataract is the principal cause of blindness accounting for 62.6% cases of blindness.[6]

Like other types of surgery, cataract surgery induces a surgical inflammatory response. Uncontrolled inflammation may lead to serious side effects, such as Infectious postoperative endophthalmitis (IPOE), posterior synechia, uveitis, and secondary glaucoma. IPOE is among the most feared adverse events of cataract surgery and although rare, is always serious and frequently sight-threatening. Management of inflammation is thus a mainstay in modern cataract surgery. [7]

Drug utilization research was defined by World Health Organization (WHO) in 1977 as the marketing, distribution, prescription, and use of drugs in a society, with special emphasis on the resulting medical, social and economic consequences. To increase the therapeutic efficacy and minimize the development of resistance, drug utilization pattern needs to be evaluated periodically. [8, 9, 10] Good quality of drugs should be available and affordable to the individual and to the community to enhance rational use of drugs. The rational use of medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to the individual and the community pattern is necessary to promote rational drug use, especially in developing countries. [11] Globally, it is determined that more than 50% of medicines are prescribed, distributed, or traded inappropriately and that 50% of all patients fail to consume their medicines properly. [12]

This necessitates a periodic review of pattern of drug utilization to ensure safe and effective treatment. Periodic evaluation of drug utilization patterns need to be done to enable suitable modifications in prescription of drugs to increase the therapeutic benefit and decrease the adverse effects and to provide feedback to the prescribers.[13] So drug utilization studies are the powerful exploratory tools to determine the role of drugs in the society and also forms an essential part of pharmacoepidemiology which helps in providing the insights into various aspects of drug prescribing and drug use.

With the background of paucity of studies regarding prescribing pattern of drugs used in post cataract patients from south India, the above study was designed to assess the patterns of prescription and drug utilization by measuring WHO delineated drug use indicators in the post cataract patients, department of ophthalmology, at Minto Hospital attached to BMCRI, Bangalore.

OBJECTIVE

To analyze drug utilization in post-cataract patients based on WHO indicators.

MATERIALS AND METHODS

Across-sectional, observational study was conducted in Department of Ophthalmology at Minto Hospital attached to BMCRI, Bangalore during December2014 - May 2015. The approval was obtained from Institutional Ethics Committee before initiating the study.

A total of 110 prescriptions were analyzed who visited in-patient department. The data was collected from patients of all age groups, of either gender who were diagnosed with cataract by the ophthalmologist by comprehensive eye exam that includes: visual acuity test, dilated eye exam and tonometry and patients who gave written informed consent were included in the study. Their data was recorded in a proforma containing patient's demographic profile, diagnosis of disease and drug regimen which included names of prescribed drugs, their dose, frequency, duration, and route of administration.

The collected data was tabulated to calculate average numbers of drug per prescription. Prescribed drugs were classified on the basis of pharmacological classes and depending on their dosage form, route of administration and others like FDC (fixed dose combinations) and most frequently used drug were reported.

STATISTICAL ANALYSIS

The results were analyzed using descriptive statistics namely mean, standard deviation and percentage where ever applicable.

RESULTS

A total 110 prescriptions were analyzed by using WHO delineated drug use indicators in post cataract patients of Ophthalmology department.

A total of 110 prescriptions were analyzed. Patients were categorized based on their age into three groups. Less than 40 years accounted for 7.28%, 41-60 years accounted for 34.54% and more than 60 years accounted for 58% as depicted in graph 1.
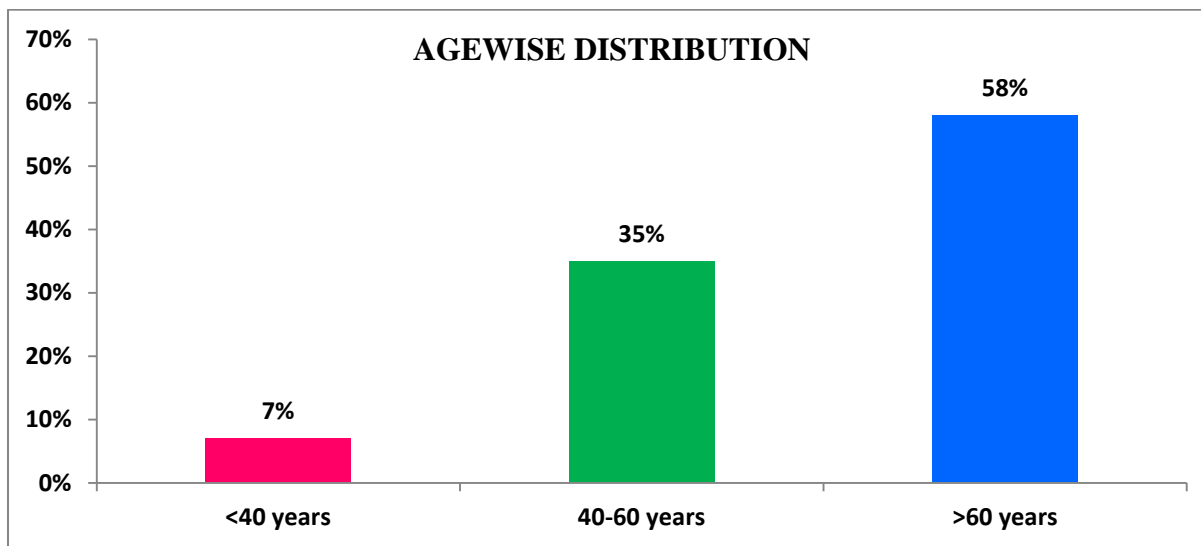

Graph 1: Age wise Distribution

Out of 110 patients, 49% were male and 51% were female. They were associated with other co-morbidities like Diabetes mellitus (DM) 8.18%, Hypertension (HTN) 12.72% and patients with both DM+HTN 4.54%, others were 3.63%.

A total of 110 prescriptions were analyzed which included 431 drugs. Evaluation of drugs using WHO indicators are depicted in table 1. Average number of drugs per prescription was 3.91. The number of drugs per prescription varied from one to five drugs, 41% of prescriptions had five drugs followed by 28% of prescriptions were four drugs, 17% of prescriptions were three drugs, 9% of prescriptions were two drugs and 5% of prescriptions were one drug as depicted graph 2.
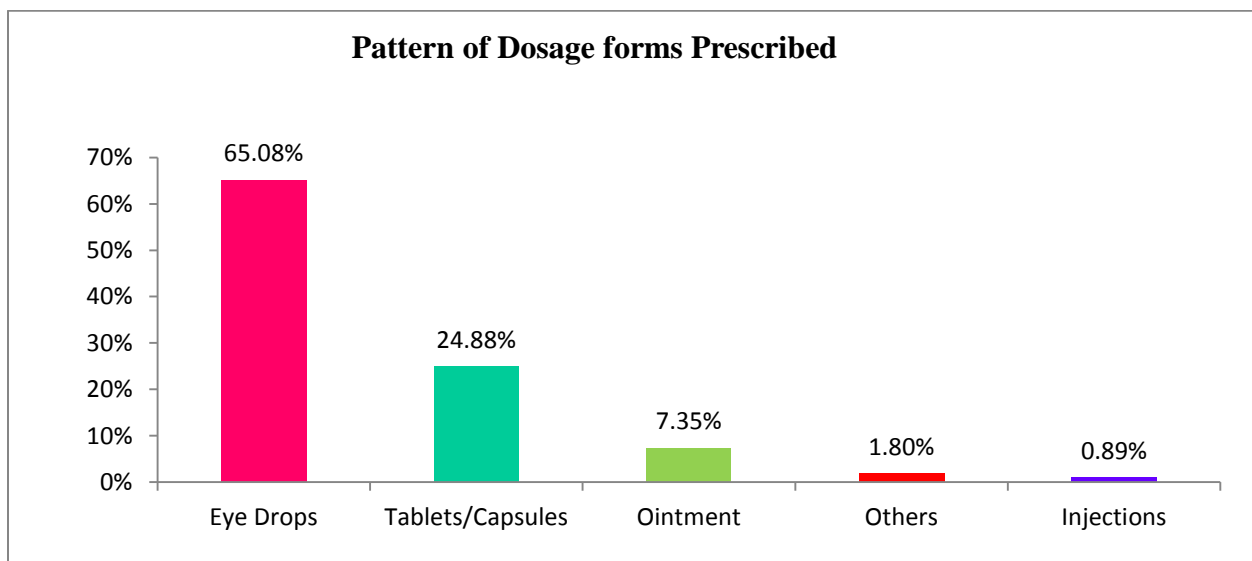
Number Of Drugs Prescribed

5%

9%

41%

17%

28%

- Monotherapy
- Two Drugs
- Three Drugs
- Four Drugs
- Five drugs
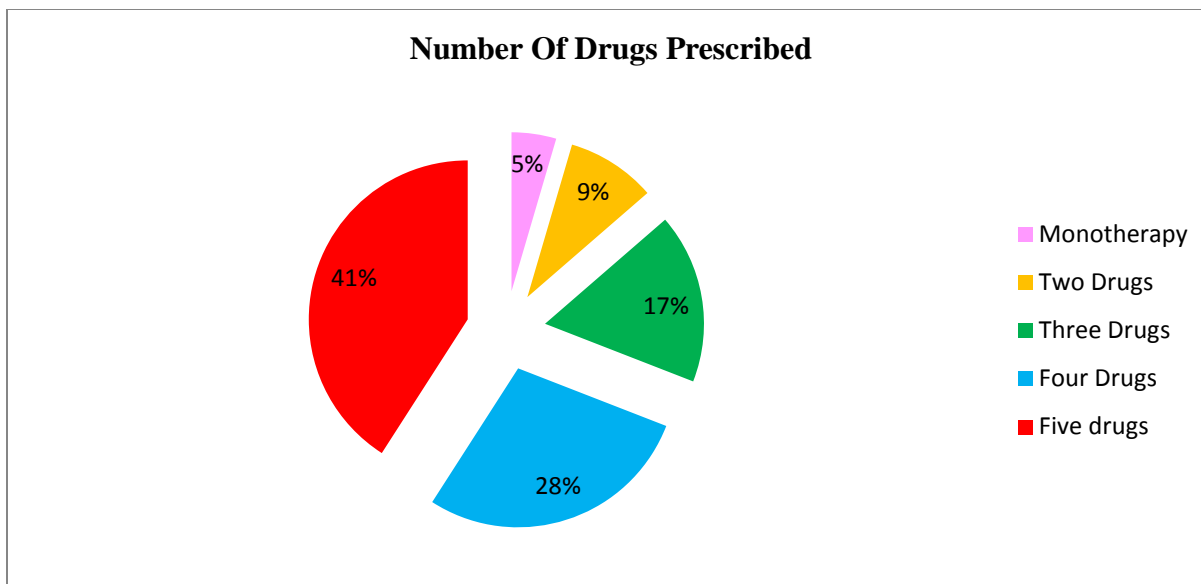
Graph 2: Numbers of drugs prescribed

Who prescribing indicator

WHO PRESCRIBING INDICATORS	
Average number of drugs per prescription	3.91
Percentage of encounters with injection	0.89%
Percentage of encounters with antibiotic	52%
Percentage of drugs prescribed by generic name	5.4%
Percentage of drugs prescribed from essential drug list formulary	72.92%

The commonest dosage form prescribed was topical formulations in the form of eye drops 65.08% and ointment 7.35% followed by oral formulations 24.8% and injectables were 0.89% and other dosage form (1.8%) as depicted in the graph 3.

Pattern of Dosage forms Prescribed

65.08%

24.88%

7.35%

1.80%

0.89%

Eye Drops | Tablets/Capsules | Ointment | Others | Injections

Graph 3: Dosage forms.

Majority of the cataract cases diagnosed were senile immature cataract 98.8%, remaining 1.2% accounting for congenital cataract.

In the present study antimicrobial agents (AMAs) were the commonly prescribed drugs. Among AMAs : antibacterials, antiviral and antifungal accounted for (52%) which was followed by analgesic (23%), steroid (7%), FDC (10%), Mydriatics (4%) and others (4%) as depicted in graph 4. The commonly prescribed AMAs in the form of eyedrops is represented in graph 5. Prednisolone was most commonly prescribed steroid. Other Miscellaneous drugs found in cataract prescription were Timolol, Acetazolamide, H2 blockers, Proton pump inhibitors, Lubricants etc.
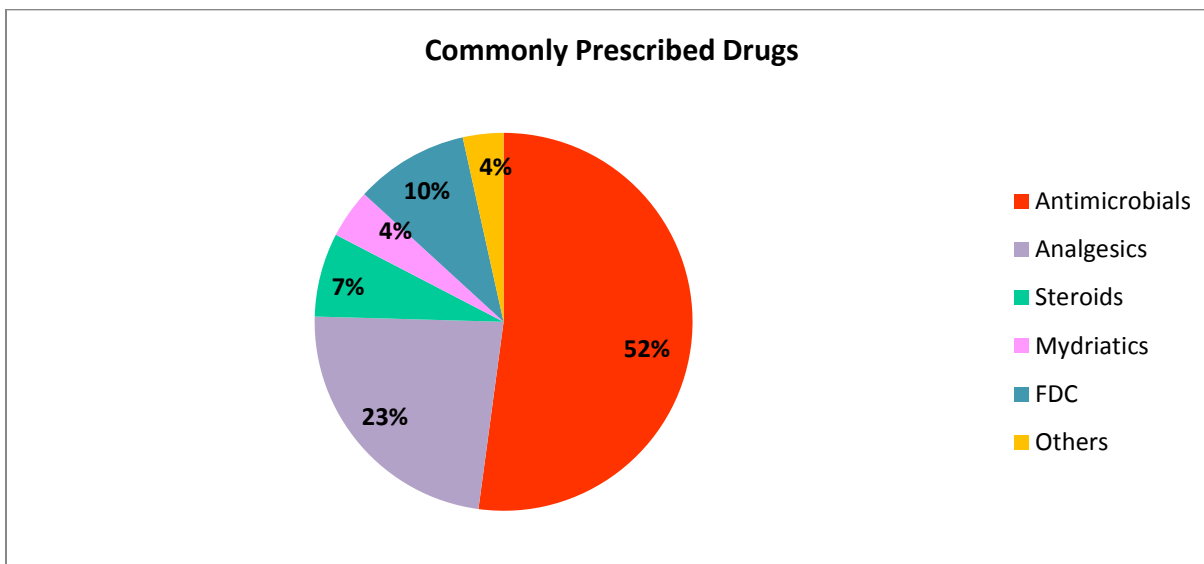
Graph 4: Commonly Prescribed Drugs.
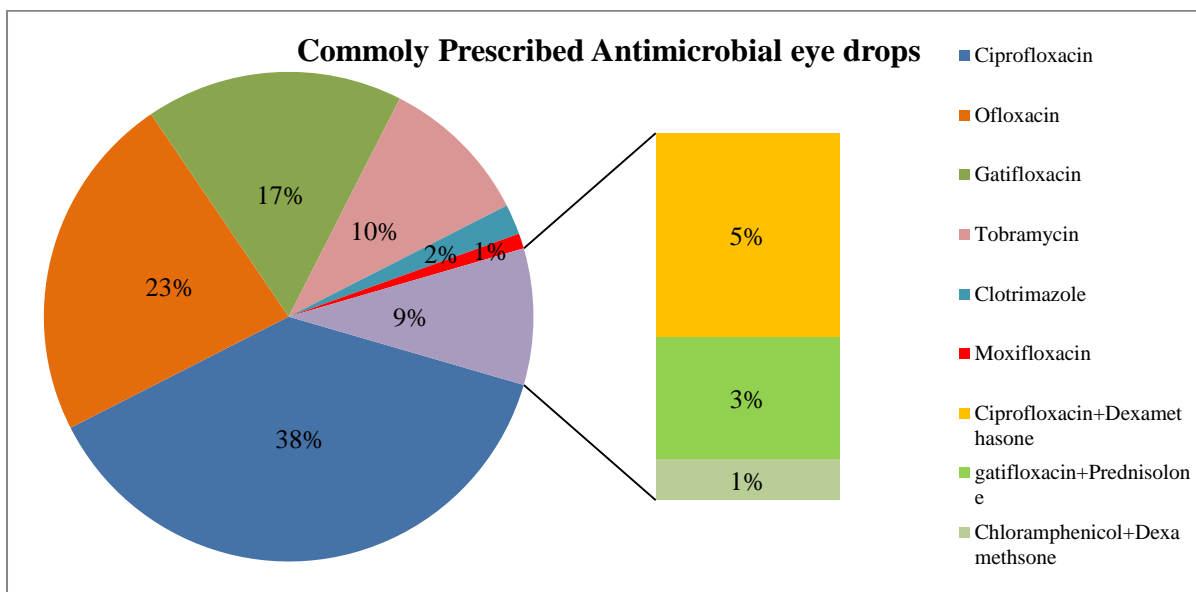
Graph 5: Commonly prescribed Antimicrobial eye drops.

The percentage of drugs prescribed by generic name was 5.4% and percentage of drugs prescribed from NLEM was 72.92%.

DISCUSSION

Providing the right medicine to the right patient, right dose, right route at the right time is a central priority of health care. This is ensured by effective implementation of the WHO's recommendation on rational drug policies.[14] Drug utilization studies are important for obtaining data about the prescribing patterns and quality of its use, the determinants of drug use, and the outcomes of drug use.[15]

A total number of 110 prescriptions were analyzed during the study period who visited Ophthalmology in-patient Department. In the present study demographic data showed that a maximum number of patients belonged to the age group of >60 years. The above finding can be explained by the fact that majority of the patients in the study sought medical help for cataract which is the commonest ocular disease in this age group. Male and female ratios were equal. These findings suggest that the eye diseases are age related but not gender linked.

In the present study, as mentioned above 110 prescriptions were analyzed and the total numbers of drugs prescribed were 431. Average number of drugs per prescription is an important index as it tends to measure the degree of polypharmacy of drugs. [16] Average number of drugs per prescription was 3.91 in our study. The above findings are in concordance with studies conducted by Rajesh et al [17] and PoojaPrajwal et al[18]. The average number of drugs per prescription in there studies was 3.52 and 3.28 respectively. As per WHO, the average number of drugs should be monitored to prevent over prescribing and to avoid the risk of drug-drug interactions. Therefore it is advisable to keep the number of drugs per prescription as low as possible.

The analysis of prescriptions showed, topical formulations were 72.4% in the form of eye drops 65.08% and ointment 7.35% which were high compared to other preparations and injectables 0.89% being least prescribed. The study result was consistent with study conducted by Rajesh kumar et al [17] , Bhavik Kumar et al [20] and poojaprajwal et al [18] reported that maximum numbers of drug prescribed were in topical formulation.A topical formulation in ophthalmic practice is the conventional and most accepted route of administration which could minimize the systemic side effects.

Drugs like antibacterials, antivirals, antifungals, analgesics, anti-inflammatory, prostaglandins analogues, H_2 receptor blockers, proton pump inhibitors, lubricants, multivitamins were commonly prescribed. These findings were similar to the studies conducted by Rajesh kumar et al [17], Bhavik Kumar et al [19]. Lubricants were used to minimize irritation. Anti-inflammatory and analgesics were also 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. [20] Thus, the present study reveals remarkable prescribing pattern in post cataract surgery patients.

In our study AMAs accounted for 52%, out of which 47% were prescribed as single AMAs and 5% were prescribed as FDC. Among antibacterials, fluoroquinolones was commonly prescribed. Fluoroquinolones are frequently used as they have extended spectrum of activity against Gram negative as well Gram positive organisms and less side effects on topical administration.[16] As per WHO, 15%-20% prescription with antibiotics is recommended in most of the countries where infectious disease is more prevalent.[21] So appropriate use of AMAs is absolutely necessary to prevent drug resistance.

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. [22] The above parameters were clearly recorded in all the prescriptions analyzed.

The percentage of drugs prescribed by generic name was 5.4% which was lower than that recommended by WHO (100%), our study results were higher when compared to study conducted by Poojaprajwal et al [18]. However, prescribing drugs by generic name makes the treatment cost effective and it avoids prescription writing errors.[23] Hence we should encourage generic prescribing by educational intervention methods and strict compliance to WHO drug policies.[14]

Essential medicines as defined by the WHO are those drugs that satisfy the health care needs of the majority of the population: they should therefore be available at all times, in adequate amounts and in the appropriate dosage forms, at a price the community

can afford. [23, 24] The percentage of drugs prescribed from the National List of Essential Medicine of India (NLEM) was 72.92% which is higher when compared to studies conducted by pooja et al, [18]. WHO recommends the drugs prescribed from essential medicine list (NLEM) to be 100% which is lower in the present study. There is a need to adhere to the Essential drug list of particular country while prescribing as it does not only promote rational use of medicines considering the three important aspects i.e. cost, safety and efficacy but it also promotes prescription by generic names.

Cost analysis would have been helpful to the prescribers to prescribe cost effective drug, which would have reduced the financial burden to patients/care giver. By giving feedback to hospital administration/drug procurement committee, in turn helps in procurement and utilization of drugs.

CONCLUSION

Evaluation of drugs using WHO core prescribing indicators concluded that the number of drugs prescribed by generic names and from NLEM was low, when compared to WHO standards. The establishment and implementation of appropriate clinical guidelines will help in implementing the principles of rational pharmacotherapeutics and strengthening hospital drug supply chain.

DECLARATIONS

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Conflict of interest: NIL
Ethics approval: YES

REFRENCES

[1]. Thulasiraj RD, Rahamathulla R, Saraswati A, Selvaraj S, Ellwein LB. The Sivaganga eye survey: I. Blindness and cataract surgery. Ophthalmic Epidemiol 9, 2002, 299-312.

[2]. Nirmalan PK, Thulasiraj RD, Maneksha V, Rahmathullah R, Ramakrishnan R, Padmavathi A, et al. A population based eye survey of older adults in Tirunelveli district of south India: Blindness, cataract surgery and visual outcomes. Br J Ophthalmol 86, 2002, 505-12.

[3]. Murthy GV, Gupta S, Ellwein LB, Munoz SR, Bachani D, Dada VK. A population-based eye survey of older adults in a rural district of Rajasthan: I. Central vision impairment, blindness and cataract surgery. Ophthalmology 108, 2001, 679-85.

[4]. Mohan M. National survey of blindness-India. NPCB-WHO Report. New Delhi: Ministry of Health and Family Welfare, Government of India; 1989.

[5]. World Health Organization. Global initiative for the elimination of avoidable blindness: An informal consultation. Geneva: WHO; 1997.

[6]. Government of India Annual Report 2003-4 Ministry of Health and Family Welfare, New Delhi.

[7]. Cho H, Wolf KJ, Wolf EJ. Management of ocular inflammation and pain following cataract surgery: focus on bromfenac ophthalmic solution. ClinOphthalmol., 199(3), 2009, 210.

[8]. World Health Organization, Introduction to Drug Utilization Research, WHO, Oslo, Norway, 2003.

[9]. Nepalese National Formulary. 1st Edition. Nepal: Kathmandu Nepal Ministry of Health; 1997.

[10]. Suman RK, Deshmukh YA, Ray I, Gore VS. Drug utilization studies in glaucoma patients at MGM Medical College and Hospital. Int J Sci Res. 7(2), 2013, 433-5.

[11]. Lalan KB, Ghongane BB. Drug prescription pattern of out-patients in a tertiary teaching hospital in Maharastra. Int J Pharm Bio Sci. 3(3), 2012, 225-229.

[12]. How to Investigate Drug Use in HealthFacilities: Selected Drug Use indicators. WHO, Geneva, Switzerland, 1993 [cited on 2017]. Available from: URL: http://apps.who.int/medicinedocs/en/d/Js2289e/

[13]. Mainirajiv,Vermakk, Biswas NR. Drug utilization study in Dermatology in a tertiary care hospital in Delhi. Ind J PhysiolPharmacol. 46, 2002, 107-10.

[14]. Abidi A, Gupta S, Kansal S, Ramgopal. Prescription auditing and drug utilization pattern in a tertiary care teaching hospital of western UP. Int J Basic ClinPharmacol. 1(3), 2012, 184-190.

[15]. How to Investigate Drug Use in HealthFacilities: Selected Drug Use indicators. WHO, Geneva, Switzerland, 1993 [cited on 2017]. Available from: URL: http://apps.who.int/medicinedocs/en/d/Js2289e/

[16]. Jadhav PR, Moghe VV, Deshmukh YA. Drug utilization study in ophthalmology outpatients at a tertiary care teaching hospital. ISRN Pharmacol. 2013, 2013, 768-792.

[17]. Rajesh kumarSuman, YA Deshmukh, Ipseeta Ray Mohanty, Varshav S. Gore. Drug Utilization studies in Glaucoma Patients at MGM medical college and Hospital. Int J of Sci research 2(7), 2013, 433-435.

[18]. PoojaPrajwal. Assessment of the prescription in cataract patients for the Drug Utilization Pattern. International journal of advances in pharmaceutical research 4(10), 2013.

[19]. Bhavikkumar HS, Bhavin V. Divyesh JV, Jasmina SS. Drug utilization Study in cataract Patients from South Gujrat region. Indian Journal of Pharmacy Practice 4(3), 2011, 46-50.

[20]. In: Goodman L, Gilman A, Brunton L, Lazo J, Parker K, editors. The pharmacological basis of therapeutics. New York: McGraw-Hill; 12, 2011, 947-948.

[21]. Banerjee I, Bhadury T, Sengupta T, Roy D. Drug utilization study in ophthalmology out-patients department of a medical college in India. Ann Med Health Sci Res. 4(4), 2014, 667-670.

[22]. Ashish G, Rashmi S, Sujata S, Sharma BD. Pharmacoepidemology of drugs utilized in ophthalmic outpatient and inpatient department of a tertiary care hospital. Journal of Applied Pharmaceutical Science. 1(9), 2011, 135-140.

[23]. Rataboli PV, Garg A. Confusing brand names: Nightmare of medical profession. J Postgraduate Medicine. 51(1), 2005, 13-16.

[24]. The Selection and Use of Essential Medicines. WHO Technical Report Series, 2003, 914. [Cited on 2017]. Available from: URL: http://apps.who.int/medicinedocs/en/d/Js4875e/