IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals
ISSN 2349-7203
HUMAN

Human Journals
Thesis
August 2019 Vol.:16, Issue:1

A Study on Drug Utilization among Ambulatory Patients Visiting Department of Ophthalmology at a Tertiary Care Hospital

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Submission: 23 July 2019
Accepted: 28 July 2019
Published: 30 August 2019

Keywords: Drug Utilization, Ambulatory Patients, Ophthalmology, Tertiary Care Hospital

ABSTRACT

AIM: The present study was carried out to describe the drug utilization pattern in ambulatory patients visiting department of ophthalmology at Basaweshwar Teaching and General Hospital, Kalaburagi. **METHODS:** Prescriptions of 203 patients were audited through a specially designed form and analyzed for the following: Average number of drugs per prescription, total number of drugs prescribed, number of drugs prescribed with brand name and generic name, dosage form prescribed, number of antibiotics prescribed, number of drugs from National Essential Drug list [NEDL]. **RESULTS:** Prescription analysis showed that the total number of drugs prescribed was 488, the average number of drugs per prescription was 2. The drugs prescribed with brand name are 385 (78.9%) and drugs prescribed with generic name were 103(21.1%). The maximum number of drugs were prescribed in the form of eye drops 56%, followed by ointments 20%, tablets 19% and suspensions 5%. The total number of antibiotics prescribed were 220, which constitutes 45.08% of the total drugs prescribed. The number of drugs prescribed from NEDL was 414(85.03%) **CONCLUSION:** The study indicated that the polypharmacy is low, but should show an ample scope for improvement by encouraging the ophthalmologist to prescribe by generic name.

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INTRODUCTION

Ophthalmology is defined as the branch of medical science dealing with the anatomy, functions, and disease of eye. The eye disease is first recorded in 1835-45. At the age of 40's you probably notice that your vision is changing, these changes are a normal part of aging. But as you age, you are at higher risk of developing age related eye diseases and conditions. Many eye diseases have no early warning signs of symptoms but, a dilated exam can detect eye diseases in their preliminary stages before vision loss occurs so, everyone at the age of 50's is recommended to visit eye care professionals for a comprehensive dilated eye exam. Thus, the suitable medication or treatment is required for proper eye care.

We substantially rely on our eyes in everyday life, yet this organ has been neglected in occupational medicine. The question is how occupational factors accelerate the natural ageing processes of the eye, and whether specific occupational hazards, in concentrations below the accepted threshold values, induce acute and chronic eye damage or disease. Furthermore, the question is whether we can prevent eye diseases of the advanced age by introducing preventive measures at work and at home. Numerous epidemiological studies have demonstrated short-term associations between high levels of air pollution and increased acute mortality and morbidity. There is consistent evidence that increased levels of five major outdoor-air pollutants, that is, particles of less than 10 µm in aerodynamic diameter (PM10), ozone (O3), carbon monoxide (CO), Sulphur dioxide (SO2), nitrogen monoxide (NO), and nitrogen dioxide (NO2) are released into the atmosphere, cross long distances, and induce adverse effects on living nature. A survey of literature has shown that in spite of the knowledge on increased pollution rates by the above mentioned four utilization pollutants and more frequent reports of eye discomfort, little information is available about the effects of air pollution on the eye, particularly on retina and retinal vessels, when compared to the effects of air pollution on pulmonary or cardio-vascular systems.

Studies have found that the majority of computer workers experience some eye or vision symptoms. A national survey of doctors of optometry found that more than 14% of their patients present with eye or vision-related symptoms resulting from computer work. The most common symptoms are eyestrain, headaches, blurred vision and neck or shoulder pain. Computer workers and others concerned with their eye health and vision should seek the advice and assistance of doctors of optometry in their community regarding the prevention, diagnosis, treatment and/or management of computer related problems in the workplace.

Smoking also causes age-related macular degeneration. Environmental tobacco smoke exposure increases risk of ophthalmopathy in Grave's disease. Smokers with thyroid eye disease have poor prognosis as compared to nonsmokers. Maternal smoking during pregnancy is associated with 6.55 times increased risk of strabismus amongst children of such mothers. The changes on ocular surface associated with smoking include alteration in lipid layer of tear film, reduced tear secretion and decreased corneal and conjunctival sensitivity. Passive smoking can also increase the risk of these disorders.

Hence, Awareness and knowledge of common eye diseases play an important role in encouraging people to seek treatment for eye problems. This further helps in reducing the burden of visual impairment among the population in a society. Eye health education that encourages people to seek consultation from an ophthalmologist.

An exploration of knowledge and attitudes held and the self-care practices undertaken by the community can aid in the effective promotion of preventive approaches to eye health care.

The external ocular surface acquires a microbial flora at birth and some of the commensal flora may become resident in the conjunctiva and eyelids with a potential to become pathogenic. Moreover, all microorganisms derived from the environment can also transiently colonize the eye and, when given the opportunity, can invade the ocular tissues. The modes of transmission of anterior and posterior segment infections comprise direct contact at the ocular surface or invasion of the blood-eye barrier.[20]

All parts of the eye may be infected by bacteria, fungi, parasites, or viruses. Anti-infectives such as antibiotics (ATB), antiseptics, antifungals, anti-helminths or antivirals can be used depending on the type of infection. Although ocular infection may be considered to be a minor infection, it can be "vision-threatening".[20]

There has been a chronic lack of innovation in ocular drug development despite an expanding market potential. A major advantage of ocular disease is that in contrast to other parts of central nervous system, drug delivery can be more targeted using either drops applied to surface of the eye and injections made directly into the eye. These routes of drug delivery minimize systemic toxic effect and therefore enhance therapeutic indices.

The efficacy and safety of drugs used in ophthalmology is often confounded by the accuracy of dose administration of the ophthalmic preparation by the patients which in turn is

dependent on proper education by the physician, a rational prescription and proper comprehension of the information provided to the patient, besides many other factors. Indiscriminate use of topical ophthalmic non-steroidal anti-inflammatory drugs can result in adverse effects ranging from local irritant effects, indolent corneal ulcers to systemic effects such as exacerbation of bronchial asthma. Long term use of ocular anti-inflammatories cause scarring of conjunctiva and dry eyes.[4]

Thus, drug therapy is a major component of patient care management in health care settings. Prescribers and consumers are flooded with a vast array of pharmaceutical products with innumerable brand names, available often at an unaffordable cost. Irrational and inappropriate use of drugs in health care system observed globally is a major concern.[1]

Drug utilization research may provide insights into different aspects of drug prescribing including pattern, determinants, outcomes of drug use and quality control cycle (signals of irrational use and interventions to improve drug use). Drug utilization research, part of clinical pharmacology, explores the links between pharmacotherapeutic and forensic science (forgery of prescriptions).[2]

Drug utilization is the defined marketing, distribution, prescription and the use of drugs in society, with special emphasis on the resultant medical, social and economic consequences. The research in this field aims to analyze the developmental trends of drug usage at various levels in the health care system. The data which is obtained may give a crude estimate of the disease prevalence and the estimate of drug expenditures.[3]

The marketing of new drugs, the variations in the pattern of drug prescribing, concerns about the delayed adverse effects of drugs and the increase in the cost of drugs has increased the importance of drug utilization studies. To improve the overall drug use, especially in developing countries, international agencies like the World Health Organization (WHO) and the International Network for the rational use of drugs (INRUD) have applied themselves to evolve standard drug use indicators. These indicators help us to improve our performance from time to time.

Regular audit of prescriptions and providing the feedback to physicians can improve their performance and increase the effectiveness and safety of treatment provided. Audit in drug use is defined as an examination of the way in which drugs are used in clinical practice carried out at intervals frequent enough to maintain a generally accepted standard of

prescribing. Prescription audits are important since evidence suggest a gap between the health care that patients receive and the practice that is recommended.[4]

Drug utilization pattern needs to be evaluated from time to time so as to increase therapeutic efficacy and decrease adverse effects. Studies on the process of drug utilization focus on the factors related to the prescribing, dispensing, administration, and taking of medications, and its associated events, covering the medical and non-medical determinants of drug utilizations, the effects of drug utilization, as well as studies of how drug utilization relates to the effects of drug use, beneficial or adverse.[6]

Medication problem is potentially tragic and costly in both human and economic terms, for patients and professionals alike. In health care setting, there are many problems regarding drugs administration which includes errors in prescribing and transcription. The irrational use of drugs by both prescribers and consumer is in fact a global problem which can be assessed by a standardized method of prescription analysis.[12]

The deleterious impact of poor quality prescriptions, under and over-dosing, duplication and multiplicity of drugs on the restricted purse of sick persons, particularly those belonging to lower socioeconomic status, which also adversely effects their households as a whole in terms of the non-health expenditures, such as food, clothing and education. Apart from having a negative impact on workflow in practice, prescription errors may pose threat to patient safety. The problem related to prescribing medication has not been adequately studied, especially in developing countries. One of the ways of assessing prescribing practices is ‘prescribing audit’ (PA), with which prescribers get regular feedback about their prescriptions.[12]

Use of medicines constitutes an important part of many medical treatments and disease prevention interventions. Some studies on drug utilization in Spain have observed that immigrates consume fewer medicines and have much lower expenditures on pharmaceuticals compared to the autochthonous population. Another aspect modulating drug utilization pattern of migrates is the possible lack of trust in the proposed treatment and as a consequence, poor compliance. There has been development of many new therapeutic agents which have made it possible to cure or provide the symptomatic control of many clinical disorders. However in many circumstances drugs are not used rationally for optimal benefits and safety. The study has been conducted in apex institute of their country highlighting the

rationale of drug use. This necessitates a periodic review of pattern of drug utilization to ensure safe and effective treatment. [6] Thus, the ultimate goal of drug utilization research must be to assess whether drug therapy is rational or not. To reach this goal, methods for auditing drug therapy towards rationality are necessary.[4]

Inappropriate use of drugs and dosage forms result in potential health hazard to the patients and cause financial burden. To avoid such problems every member of the healthcare system should practice rationally.[5]

World Health Organization (WHO) defines RUD as "Medicine use is rational (appropriate, proper, correct) when patients receive the appropriate medicines, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost both to them and the community. Irrational (inappropriate, improper, incorrect) use of medicines is when one or more of these conditions is not met."[16]

The five important criteria for rational drug use are accurate diagnosis, proper prescribing, correct dispensing, suitable packing and patient adherence. The availability and affordability of drugs along with their rational use is crucial for rendering effective health-care. In this perspective, drug utilization study is an important tool in assessing rationality of prescriptions. Thus, in ophthalmology practice, rational prescribing plays a crucial role in reducing the ocular disease burden of the country.

RUD actually addresses different steps in supply-use chain of drugs i.e. selection, prescribing, dispensing, monitoring and feedback. Analysis and evaluation of all these steps is important for its effective implementation.[16]

To investigate the rational use of drugs, WHO have established few core indicators, viz. prescribing indicators are one of them. Prescribing indicators included number of drugs prescribing per encounter, percentage of drugs prescribed by generic name, percentage of encounter by injection and antibiotics prescription and percentage of drugs prescribed from essential medicine list (EML).

Rational use of antibiotics is extremely important as injudicious use can adversely affect the patient, cause emergence of antibiotic resistance and increase the cost. When employed rationally, significant reduction in the mortality and morbidity and saving in resources can be achieved. Broad-spectrum antibiotic are commonly used to effectively treat ocular infection.

The frequency of resistant bacteria appears to be considerable on the basis of in vitro breakpoints applicable to systemic use. This phenomenon does not alter:

- The clinical efficacy of topical antibiotics,
- The ability of these products to eliminate bacteria from the ocular surface.

Topical antibiotics are able to eradicate in vitro resistant strains in patients and provide the same cure rate for both susceptible and resistant strains.[20]

Despite the knowledge about effectiveness of prophylactic antibiotics, administrative regimens are often inappropriate and, secondly, duration of prophylaxis is often longer than recommended. This over and prolonged use has contributed to overwhelming rate of antibiotic resistance.[21]

The aim of the present study was to describe the drug utilization pattern in an ophthalmology out-patient department using WHO core indicators such as,

- Total No. of Drugs prescribed
- Number of Drugs Prescribed with Generic Name
- Number of Antibiotics Prescribed
- Number of Injections Prescribed
- Number of Drugs from National Essential list of Medicines
- Number of Drugs Prescribed with Brand Name

In the view of above facts, we have taken up a project entitled **"A STUDY ON DRUG UTILIZATION AMONG AMBULATORY PATIENTS VISITING DEPARTMENT OF OPHTHALMOLOGY AT A TERTIARY CARE HOSPTAL"** at the study site.

OBJECTIVE OF STUDY

The present study was carried out by the following objectives:

Main objective:

To assess the drug utilization among ambulatory patients visiting department of ophthalmology.

Specific objectives:

- Demographic details of the patients.
- Socio-economic data.
- Indications for which the patient visited OPD.
- To assess the prescription by using WHO core prescribing indicators.

REVIEW OF LITERATURE

Pradeep RJ *et al.*, carried out Drug Utilisation Study In Ophthalmology Outpatients at A Tertiary Care Teaching Hospital. Their objective was to study the drug utilization and describe the prescribing practices of ophthalmologists in a tertiary care teaching hospital. The results showed that the average number of drugs per prescription was 1.49. Percentage of drugs prescribed by generic name was 2.35%. Percentage of encounters with antibiotics was 44.83%. Percentage of drugs prescribed from National Essential drug list (NEDL)/National Formulary of India (NFI) was 19.48%. Patient's knowledge of correct dosage was 93.83%. Antimicrobial agents were the most commonly prescribed drugs followed by anti allergy drugs and ocular lubricants. Fluoroquinolones accounted for 60% of the total antimicrobial drugs; of which gatifloxacin was the most frequently prescribed fluoroquinolone. They showed ample scope for improvement in encouraging the ophthalmologists to prescribe by generic name and selection of essential drugs from NEDL/NFI.[1]

Kanchan Kumar M *et al.*, carried out A Study of Rational Use of Drugs Among The Ophthalmic Inpatients of A Government Teaching Hospital In View of Forensic Pharmacology. Their objective was to investigate the nature of utilization of drugs in respect of rationality correlating the clinical and forensic pharmacology. Results revealed that proportion of drugs from Essential Medicines List (EML) was 51.62%, while 54.05% was prescribed by generic names. Most commonly prescribed drugs were antibiotics (100%), analgesic-anti-inflammatory agents (100%) and mydriatic-cycloplegic agents (91.98%).

Average number of drugs per prescription was 4.03±1.5 and average cost per day per prescription was 99.22 INR (Indian Rupees). Injectable were prescribed in 97.36% cases, and 10.81% of total drugs (37) prescribed. They concluded that prescribing practices were not always in accordance with the WHO criteria for rational use of drugs. They suggested that there is a need to provide more inputs to the Ophthalmologists to promote rational use of drugs. [2]

Yasmeen M *et al,* carried out A Drug Utilization Study In The Ophthalmology Department of A Medical College, Karnataka, India. Their aim was to evaluate the pattern of prescription and the use of drugs in the out patients ophthalmology department at a medical college. The results showed that the average number of drugs per prescription was 2.00%. The maximum number of drugs which were prescribed, were in the form of eye drops (65.81%), followed by ointments (17.63%), capsules (8.02%), tablets (6.59%), syrups (0.76%), injections (0.76%) and lotions (0.31%). The dosage form was indicated for 99.88% of the drugs, the frequency of drug administration for 94% of the drugs and the duration of treatment for only 75% of the drugs prescribed. The number of antibiotics which were prescribed were 399(30.18%), out of which 257(64.3%) were antibiotics which were prescribed in the form of drops, 129(32.26%) were prescribed as ointments and 13 (3.25%) were prescribed orally. The number of encounters with anti-inflammatory and anti-allergic drugs prescribed were138 (10.43%).They concluded that there is a need for the improvement in prescription writing, as the duration of therapy was missing in 25% of the prescriptions. This, coupled with low generic prescribing, could result in a less safe and a more expensive prescribing. It is always preferred to have a complete prescription which should include name, age, sex, diagnosis and rational drug treatment with less number of drugs, the proper dosage form, the frequency of administration and the duration of therapy.[3]

Rathnakar UP *et al.*, carried out A Descriptive Study of Drug Utilization In Outpatients of Ophthalmology Department of A University Teaching Hospital In Southern India. Their objective was to assess the drug utilization pattern in an ophthalmology out-patient department of a university teaching hospital in Southern India primarily by using the drug prescribing indicators. The results showed that the number of drugs per prescription ranged from one to four. Fluoroquinolones were the commonest drugs prescribed while their combination with dexamethasone was the commonest fixed dose combination prescribed. All the prescriptions contained the dose, frequency of administration and the duration of

treatment. However generic names were not used in the prescriptions. They concluded that Polypharmacy was low in study sample. Although the prescriptions were complete in terms of dose, duration and formulation, lack of use of generic names in the prescriptions needs to be addressed. High incidence of infective conditions necessitates consideration of the local drug sensitivity pattern and patient adherence to prescribed drug regimen. [4]

Dibyendu D *et al.*, carried out Drug Utilisation Study In Outpatient Ophthalmology Department of A Tertiary Care Hospital In West Bengal. This study was designed with the aim to investigate the utilization pattern in a tertiary care hospital. The results showed that a total of 600 prescriptions were analyzed, with the average number of drugs per prescription being 2.6 (0.9). The most common disorders diagnosed were refractive errors (13.3%) followed by cataract, glaucoma and others. 1400 drugs were prescribed in six dosage forms with eye drops being the most common (57.14%) followed by tablets (14.28%), ointment (6.42%), syrup (3.92%), capsules (4.28%), lotion (0.57%), injections contributed 2.14% of the dosage forms prescribed. The frequency of drug administration was recorded in 96.6% and the duration of treatment was mentioned in 80% of the drugs prescribed. Antimicrobials were the most commonly prescribed (39.6%) followed by anti-inflammatory and anti-allergic (26.0%), anti-glaucoma drugs (23.0%), mydriatic and cycloplegics (12.8%), miotics (7.00%). Drugs were prescribed in brand name in 65.6% and that accounted for generic name in 34.3% (481/1400).They concluded that prescription writing errors were minimum, but generic prescribing was low which adds to the economic burden indirectly leading to non-compliance. There is a scope for improvement, in encouraging the ophthalmologists to prescribe by generic name and selection of essential drugs from NEDL/NFI. [5]

Pooja P *et al.*, carried out Drug Utilization Pattern In Ophthalmology Department At A Tertiary Care Hospital. The aim of the study is to assess the average number of drugs per prescription, formulations being prescribed and the category most often used in ophthalmology. In the results, it is showed that average number of drugs prescribed was 4.325. Maximum number of drugs prescribed in the form of eye drops[67.65%], Ointments [11.66%], Tablets [7.8%] Capsules [7.23%] Syrups [3.54%], Injections [2.52%]. The number of anti-biotics prescribed was [58.43%]. Out of these [66.79%] antibiotics prescribed in the form of eye drops, [31.06%] as Ointments and [2.13%] Orally. Number of encounters with Anti-inflammatory and Anti-allergic drugs were [10.1%], Miotics [3.1%], Lubricants [18.73%], Multi-vitamin [1.05%]. They concluded that, prescription writing errors were at its

minimum, thereby avoiding irrational prescriptions.Duration of treatment and prescribing by generic name were very low.Generic prescribing was seen less, which adds to economic burden making the medications expensive as per patients perspective. There is a need for development of prescribing guidelines and educational initiatives to encourage rational and appropriate use of drugs.[6]

Nihar RB *et al.*, carried out a study on Patterns of Prescription and Drug Use In Ophthalmology In A Tertiary Hospital In Delhi. This study was carried out to describe the patterns of prescription and drug use in out-patients at AIIMS, NEW DELHI. The results showed that the average number of drugs per prescription was 3.03. Duration of treatment was recorded for only 26.4% of the drugs prescribed. The maximum number of drugs prescribed were in the form of eye drops (76%), followed by tablets (10.9%), ointments (6.4%), syrups (1%), capsules (0.7%), lotions (0.3%) and injections (0.1%). No dosage form was recorded for 4.6% of the drugs prescribed. The frequency of administration was recorded for only 77.9% of the drugs prescribed. The number of antibiotics prescribed was 1059, which constitutes 34.2% of the total number of drugs prescribed. The percentage of drugs prescribed by generic name was only 35%.They concluded that there is awareness of polypharmacy but a high incidence of common prescription writing errors such as, not recording the duration of therapy, frequency of administration and dosage form. Moreover prescribing by generic name was also low.[7]

Bhavesh KL *et al.*, carried out Drug Prescription Pattern Of Outpatients In A Tertiary Care Teaching Hospital In Maharastra. Their objective was to develop baseline data on drug prescribing practices using WHO prescribing indicators for adoption in drug utilization studies. The results showed that average number of drugs per encounter was 3.62. Encounter with an antibiotic prescribed was 46.17%, with a FDC it was 46.67% and with an injection it was 0.17%. The most common group of drugs prescribed was Vitamins and Minerals (24.44%), followed by Analgesics (17.76%), Antimicrobials (16.59%) and Antiulcer drugs (16.49%). Most common drug prescribed was Ranitidine (15.89%), followed by Vitamin B complex (11.03%) and Diclofenac (10.69%). Most common antibiotic prescribed was Ciprofloxacin(3.80%), followed by Amoxicillin (3.73%) and Metronidazole (2.30%)8.They concluded that the prescribing practices in this study are not satisfactory, as suggested by polypharmacy, over prescription of antibiotics and lack of awareness of essential drugs list. The efforts of the prescriber can be successful and patient satisfaction can be achieved only if

the patient receives rational treatment for his disease or illness. This study will act as a feedback to the prescribers, so as to create awareness about the rational use of drugs.[8]

Amithkumar J *et al.*, carried out Drug Utilisation Study In Ophthalmology Outpatients Department In A Tertiary Care Teaching Hospital of Western Uttar Pradesh, India. Their objective was to investigate the drug utilization pattern in Ophthalmology Outpatient Department (OPD) at Saraswathi Institute of Medical Sciences, Hapur, India, using the World Health Organization (WHO) drug use indicators. The results showed that the average number of drugs per prescription was 2.92. The drugs were prescribed in the form of eye drops (53.08%), followed by ointments (22.43%), tablets (18.49%), and capsules (5.99%). The dosage form was indicated for all the drugs prescribed, the frequency of drug administration for 97.5% of the drugs, and the duration of treatment for 82.5% of the drugs prescribed. Antimicrobial agents were the most commonly prescribed drugs followed by lubricants, anti-inflammatory, anti-allergic, anti-glaucoma drugs, etc. Percentage of drugs prescribed by generic name and from NEDL was 1.19% and 24.45% respectively. It is important to prescribe drugs by generic names as chances of error in writing as well as the reading of the prescription are less with generic prescribing. Prescribing by brand names may result in prescription writing, and reading errors as brand names of different drugs sound similar and spell a like. In addition, generic drugs are less expensive than branded drugs, thus generic prescribing makes the treatment low cost and promotes the rational use of drugs [9].

Benarjee I *et al.*, carried out Drug Utilisation In Ophthalmology Out Patient Department of A Medical College In India. Their objective was to investigate drug utilization pattern in ophthalmology outpatient department of a medical college in India. A total of 250 prescriptions were analyzed with the average number of drugs per prescription being2.4 (0.9). The most common disorders diagnosed were refractive errors (31.6% [202/640]) followed by cataract, glaucoma and others. Drugs were prescribed in different dosage forms with eye drops being the most common (70.8% [1073/1516]) followed by tablets (15.9% [241/1516]), ointment (6.1% [93/1516]), syrup (1.1% [16/1516]) and others; injections contributed 2.1% (30/1516) of all dosage forms. The frequency of drug administration and duration of treatment was recorded in 96% (614/640) and 75% (480/640) of all prescriptions respectively. Antimicrobials were most commonly prescribed (36.4% [552/1516]) followed by anti‐inflammatory and anti‐allergic (24.2% [367/1516]), anti‐glaucoma medications (21.4% [323/1516]), mydriatic and cycloplegics (7.2% [109/1516]), miotics (6.2%

[94/1516]), multivitamins (4.6% [70/1516]). Drugs were predominantly prescribed in brand name 83% (1258/1516) instead of generic name. A total of 62% (940/1516) of drugs were prescribed from national essential medicine list. They concluded that present study revealed certain lacunae in the prescribing practices of the Ophthalmologists of the institute as evidenced by low generic prescribing, inadequate information about frequency of administration and duration of therapy in many prescriptions. This can be addressed through proper sensitization of clinicians in the art of rational prescribing.[10]

Hardik V.V. *et al.*, carried out Drug Utilisation Study In Ophthalmology Outpatients In A Tertiary Care Hospital. Their objective was to describe the patterns of prescription and drug use in Ophthalmology outpatients at GG hospital, Jamnagar, Gujarat, India. Results showed that the average number of drugs per prescription was 3.20%. Eye drops were the most commonly prescribed (66.8%) dosage form, followed by ointment (18.4%), capsules (8.66%) and tablets (6%). Dosage forms were recorded in 99.2% drugs, information about the frequency of drug administration was present in 96% of the drugs and duration of therapy was recorded in 84.7% of the drugs prescribed. The drug classes that were used most frequently were Antibiotics (45%), Ocular lubricants (24.7%), NSAIDS (17.4%) and Anti-allergy medications (8.1%). They concluded that Polypharmacy was high in our study sample. Although the prescriptions were complete in terms of dose, duration and formulation, lack of use of generic names in the prescriptions needs to be addressed.[11]

Siddarth. V. *et al.*, carried out A Study of Prescribing Practices In Outpatient Department of An Apex Tertiary Care Institute of India. Their objective was to study the prescribing practices in outpatient department of an apex tertiary care institute of India. A total of 300 prescriptions were analyzed. Results showed that an average of 2.82 drugs were prescribed per patient. Only 1.63% prescribed with Generic. The number of Antacids, Vitamins, Analgesics, Antibiotics and Antipyretics were 26.33%, 24%, 23.3%, 22.8%, and 18% respectively .They concluded it has been generally observed that system of OPD registration is good but problem areas are the body and closing of the prescription. Prescribing medicines by brand name is a cause of worry, especially in developing country like India as it increases the cost of healthcare. Prescription audit forms a very important component of medication management as well as an essential component of patient safety. The study has brought out the need for sensitization and awareness programs for doctors to improve the quality of prescription writing and periodic review of prescriptions. Sharing of prescription audit will

not only help in improving the prescribing practices but would also promote the safety culture in the organization.[12]

Rajendra G *et al.,* carried out a study on Drug Prescription Pattern of Outpatients In A Tertiary Care Hospital In Central India. Their objective was to give feedback to the prescribers, so as to create awareness about the rational and cost effective use of drugs. A total of 714 prescriptions were randomly collected and analyzed. A total of 1678 drugs were prescribed. Average number of drugs per encounter was 2.35. Drugs prescribed from essential drugs list (India) was73.54%. Drugs prescribed from essential drugs list (WHO) was 57.63%. Total number of prescriptions with an antibiotic was 45.66%. Total number of prescriptions with an injection was 14.57%. Total number of prescriptions with a FDC was 62.46%. Total 61.22% prescriptions contained 4 or more drugs. The most common group of drugs prescribed was Vitamins and Minerals (31.13%), followed by Analgesics (20.67%), Antiulcer drugs (18.55%) and Antimicrobials (16.79%). The most common drug prescribed was Omeprazole (14.89%), followed by Vitamin B complex (13.54%) and Paracetamol (11.23%). The most common antibiotic prescribed was Ciprofloxacin (4.08%), followed by Amoxicillin (3.63%) and Metronidazole (2.95%). They concluded that drug prescription practices like prescription writing in hospitals should be improved. Implementing institutional guidelines for appropriate prescription writing, basing prescription on the list of essential drugs, and emphasizing the importance of these practices in medical college curriculum and continuing medical education programs are necessary for more rational and safer drug prescribing and successful drug therapy.[13]

Suman *et al.*, carried out a study on Drug Utilisation Patterns of Drugs Used In Ophthalmology Out Patients Department At Tertiary Care Hospital. Their objective was to analyze the patterns of drugs prescribed in ophthalmology OPD. A total of 246 prescriptions of patients were analyzed who visited Ophthalmology OP Department. The total 495 drugs were prescribed. Average number of drug prescribed was 2.01. Maximum Patients were diagnosed with Cataract (25.03%) followed by Conjunctivitis (10.49%), Meibomitis (7.88%), Glaucoma (10.03%), Allergic eye (15.12%), Blepharitis (7.85%), Foreign body in eye (4.91%), Dry Eye (15.09%) and Uveitis diagnosed in 3.60% of Ophthalmology OPD. Among total 495 drugs prescribed, the combination of Antibiotic plus Steroid (23.95%) was prescribed maximum followed by Antibiotic (18.11%), Analgesic (3.64%), Steroid (17.79%), B- blocker (4.87%), Prostaglandin Analogue (3.04%), Mydriatic (5.03%), Antihistamine

(7.08%), Artificial Tear (10.10%) and other drugs (4.38). Most commonly prescribed drug was Loteprednol, Moxifloxacin and Prednisolone. They concluded that the study found lower incidence of antibiotic prescription but prescription of drugs were very low in their generic is matter of concern. The study will give right feedback to prescriber and helps to enhance rational prescribing practices. [14]

Dutta S.B. *et al.*, carried out a study on Prescribing Pattern In Ophthalmological Outpatient Department Of A Tertiary Care Teaching Hospital In Dehrdun, Uttarakand. The objective of this study was to describe the prescribing practices in Ophthalmology outpatient department (OPD) to promote rational prescribing. 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%),stye12(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. 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.[15]

Faizakram *et al.*, carried out a study on Drug Prescribing Pattern In Ophthalmology Out Patient Department In A Medical College. Their objective was to analyze drug prescribing pattern in ophthalmology OPD.A total of 176 prescriptions were analyzed the average number of drugs per prescription being 2.7 [0.78].Eye drops being the most common

(81.01%) dosage form. injections were only 0.63% of all drugs. Percentage of prescription with antibiotics were (36%) All drugs were prescribed only in brand name, none by generic name. 40.29% (940/1516) of drugs were prescribed from essential medicine list. Almost all prescriptions were having clear information on dosage form, dose, frequency and duration of treatment. It is concluded that on many parameters and prescribing indicators the prescribing pattern at institute is satisfactory specially complete drug Information for patients in prescription. Some others parameters needs improvement like absence of generic name in prescription, high percentage of antibiotics, lower percentage of drugs from EML. It seems that awareness among the clinician about rational prescribing is increasing. Still further improvement in the use of antibiotic and preparation of EML considering the requirement of specialties and suitable dosage form are the areas of continuous improvement. There is need of continuous endeavor to sensitise the clinician for rational use of drug.[16]

Prajapati V.I *et al.*, carried out a study on Drug Use In Ophthalmology Out- Patient Department. Their objective was 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. Results 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%). They conclded that 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 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 are appropriate to a large extent. There is need to conduct many

such studies at regular interval 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.[17]

Hanumant A. *et al.*, carried out a study on Prescription Analysis to Evaluate Rational Use of Antimicrobials. Their objective is to delineate the prevailing prescribing practices and to know the extent of rational therapy in outpatient setup. out of the total 400 prescriptions collected from surgery, medicine, OBG, and pediatrics OPDs, 33.33% prescriptions contained antimicrobial agents as far as irrational FDCs are concerned, out of total 43 antimicrobial FDCs, 27 prescriptions contained irrational FDCs. They concluded that pattern of prescriptions in terms of rationality of antimicrobial FDCs remains poor. There is an urgent need to develop standards of antimicrobial drug prescriptions to avoid drug resistance. Educational interventions to promote rational use of antimicrobial agents and awareness of deleterious impact of irrational prescribing habit on the community and all members of the health care system areneeded.[18]

Alam k et al carried out A Study on Rational Drug Prescribing and Despensing in Outpatients in a Tertiary Care Teaching Hospital of Western Nepal. Their objective is to analyze the prescriptions of out-patients for rational prescribing and dispensing and to evaluate the patient's knowledge regarding use of drugs, using INRUD indicators. A total of 247 prescriptions were randomly selected for analysis, wherein 720 drugs were prescribed. Only 15% of drugs were prescribed by generic name, 21.67% of the total drugs consisted of fixed-dose combinations, only 40% of drugs were from the Essential drug list of Nepal and 29.44% (n=212) were from the WHO Essential drug list. It was found that more than half (54.17 %) of the drugs were from Nepalese National Formulary and 35.69% were from WHO model formulary. Dermatological products were most commonly prescribed followed by drugs acting on central nervous system, antimicrobials and drugs acting on cardiovascular system. Among the drugs dispensed, 79.16% were oral followed by topical (18.19%) and parenteral forms (2.98%). Diagnosis was mentioned only in 3.23% (n=8) of the prescriptions and the average cost per prescription was found to be Nepalese rupees (US$ 3.26). However, 82.6% of the medication envelopes were labelled with name of the drug and 87.0 % with drug strength. Only 53.8% (n=133) of the patient knew both the duration of the therapy and administration time of drugs. They concluded that there is immense scope of improvement in

prescribing and dispensing in the hospital. Generic prescribing is urgently needed. The prescribers should be educated about generic prescribing which may have a multitude of benefits including cost minimization. The study also suggests that a hospital formulary encompassing national essential drug list is urgently required. The Drug and Therapeutics Committee of the hospital should take the leading role in rationalizing the prescribing and dispensing pattern in the hospital.

Fekede B D *et al.*, carried out a study on Assessment of Ophthalmology Drug Prescribing Pattern At Jimma University Specialized Hospital, Southwest Ethiopia. Their objective is to assess the rationality of prescribing ophthalmic drugs. A total of 196 prescription papers with ophthalmic medications were assessed. The ophthalmic disease was a more prevalent in the patients older than 50 years of accounting for more than 44%, but no difference among male and female patients. The average number of drugs per prescription was 2.26%, ranged between 1 and 5. Only 69.3% of drugs were prescribed by generic name. Among a total of 443 drugs prescribed, antibiotics were the most prescribed drug class accounting for about 60%. More than 79% and 82% of the prescriptions assessed contained strength of the drug and frequency of administration, respectively. Prescriptions contained dose and duration of therapy were only 17.8% and 12.8% respectively. They concluded that Antibiotics were the most frequently prescribed ophthalmic drugs and most prescribing parameters include dosage, frequency and duration of therapy are inadequately and incompletely recorded in the prescriptions. The number of drugs per prescriptions and prescribing by generic names were also not in line with the WHO recommendation. They recommend that prescribers should strictly adhere to WHO recommendations when to prescribe any of ophthalmic medications in order to promote rational use of drugs in such patients. In addition well-designed observational studies addressing the gaps observed are important to improve rational prescribing.

Meenakshi N *et al.*, carried out Drug Utilisation Study In Outpatient Ophthalmology Department of Government Medical College Jammu Their objective is to assess the patterns of prescription and drug utilization by measuring WHO delineated drug use indicators. This study was conducted in the Postgraduate Department of Pharmacology and Therapeutics in collaboration with the Postgraduate.

Department of Ophthalmology Govt. Medical College Hospital, Jammu. Total number of prescriptions analyzed were 440, in which total of 822 drugs were prescribed. Analysis of the prescriptions showed that average number of drugs per prescription was 1.87. The maximum number of drugs prescribed were in the form of eye drops (66.18%), followed by ointments (16%), capsules (9.5%), tablet (6.57%), syrup (0.73%), injection (0.73%) and lotion (0.24%). The dosage form was indicated for 94%, frequency of drug administration for 98% drugs and duration of treatment for only 75% of the drugs prescribed. The number of antibiotics prescribed was 266 (32.26%), out of these 160 (60.15%) antibiotics prescribed in the form of drops, 100 (37.59%) as ointment and 6 (2.26%) orally. Number of encounters with anti-inflammatory and antiallergic drugs was 92(11.2%), mydriatics and cycloplegics 64(7.9%), miotics 20 (2.4%), multivitamins 58 (7.05%) and others used were lubricant and miscellaneous eye drops 322 (40%). They concluded that writing of prescriptions in generic name was nearly absent . The trade names of many pharmacologically different drugs sound alike and spell similar. This can result in error in writing as well as reading of the prescription. It is always preferred to have complete prescription. It should include name, age, sex, diagnosis, rational drug treatment with less number of drugs, proper dosage form, frequency of administration and duration of therapy. Thus, it will give relief to patient from disease in a short span and with less cost.

Sunil K *et al.,* carried out a study on Patterns of Prescription And Drug Dispensing at pediatrics department in Lokamanya Tilak Municipal Medical College and Hospital in Mumbai. Their objective is to analyze the patterns of prescription and drug dispensing using WHO core drug use indicators and some additional indices. Results showed that the average number of drugs per encounter was 2.9 and 73.4% drugs were prescribed by generic name. Majority of drugs prescribed were in the form of syrups (60.8%). Use of antibiotics (39.6% of encounters) was frequent, but injection use (0.2% of encounters) was very low. A high number of drugs prescribed (90.3%) conformed to a model list of essential drugs and were dispensed (76.9%) by the hospital pharmacy. Certain drugs (5.7%) prescribed as syrups were not dispensed, although they were available in tablet form. Most parents (80.8%) knew the correct dosages, but only 18.5% of drugs were adequately labeled. No copy of an essential drugs list was available. The availability of key drugs was 85%. They concluded that any drug utilization study based on the WHO core drug use indicators has limitations. Determining the quality of diagnosis and evaluating the adequacy of drug choices is beyond the scope of the prescribing indicators. They stated that there is need of Interventions to

rectify over prescription of antibiotics and syrup formulations, inadequate labeling of drugs and lack of access to an essential drugs list are necessary to further improve rational drug use in their facility.

Nishita H D *et al.,* conducted a research on Prescription Audit in the Inpatients of a Tertiary Care Hospital Attached with Medical College. Their objective is to study drug utilization pattern and suggest measures to change prescribing habits for better therapeutics. A total of 306 prescriptions were analyzed for the study. The age distribution of the prescriptions included pediatric (<18 years) 23.86%, adults 63.40% and geriatric (>60 years) 12.75% patients. The proportion of males (53.27%) was slightly more than the females (46.73%) Regarding drug profile 73.01% of prescribed drugs were from the National list of essential medicines, 2011.1258 drugs out of 1986 (63.34%) were prescribed by their generic names. This is quite comparable to that of 73.4% found by a study in Indian setting. Out of 1986 drugs 95 (4.78%) FDCs were prescribed. This figure is quite low as compared to three Indian studies which reported 40.92%, 75% and 60% respectively. Fixed dose combinations have inherent disadvantages of their own. Even the WHO guidelines for selecting essential drugs state that FDCs are to be used only when necessary and the combination has been proved safe and effective. Oral formulations were the most commonly prescribed 1381 (n=1986, 69.54%) followed by injections 576 (29%) followed by topical 29 (1.46%). Use of injections was high. By this data they conclude that polypharmacy is quite common. Most of drugs were prescribed according to the NLEM 2011 as compared to two studies which reported 6.19% and 7% respectively. Prescription audit is an important measure to improve the quality of care afforded by the hospitals. Data generated on morbidity pattern coupled with current practices of treatment of these diseases provides an objective basis for preparing an NLEM2011.

Uddhao G *et al,* conducted a study on Prescription Audit of Patient Attendees in Public Health Facilities in Maharashtra, India with Special Reference To Rational Use Of Antibiotics. The main objective of this study is to analyze the prescription of drugs given to the patients in OPD and IPD of the primary and secondary level public health facilities in Maharashtra. Drug prescriptions of 961 OPD patient attendees were studied. Average number of drugs per prescription was 3.3. About 45% of prescriptions contained one or more antibiotics of which nearly 3% two antibiotics. All the prescriptions had drugs from the list prepared by the Directorate of Health services and all the drugs prescribed were generic

drugs. About 25% of the prescriptions contained at least one injection, while about 44% contained at least one antibiotic. Out of the 961 OPD prescriptions, 483 (50%) could not be reviewed because diagnosis, signs & symptoms were not mentioned. Out of 478 known diagnosis cases, 14 (2.9%) prescriptions were irrational. They concluded that Auditing of the prescriptions gives a current picture of the prescribing practices in the public health facility settings. This exercise showed that there is huge need of improvement in prescribing patterns in areas of legible handwriting, complete prescriptions with signs, symptoms, needed diagnostic test and follow up advice along with rational choice of drugs with dose and duration, establishment and implementation of appropriate clinical guidelines / SOP for common ailments, use of essential medicines list and regular update to the clinicians in form of CME s will help in implementing the principles of rational use of drugs . Medicines in wards should be regularly checked; LASA to be practiced, inadequate supply of drugs like paracetamol, NCD medicines, disposable syringes, sterile gloves etc., shall be addressed.

METHODOLOGY

Method and collection of data:

Study site:

Department of Ophthalmology, Basaveshwar Teaching and General Hospital, Kalaburagi.

Study duration:

The study has been carried out for a period of 6 months.

Study design: “A Prospective Study”.

Study Criteria: The study has been carried out by considering the following criteria:

Inclusion criteria:

1. Patients irrespective of their age and sex visiting ophthalmology department.
2. Patients willing to participate in the study.
3. Patients treated in ophthalmology OPD for any condition except refractive errors.

Exclusion criteria:

1. Patients diagnosed with refractive errors.

2. Patients not willing to participate in the study.

Source of data:

Data will be collected from:

a) Out-patient Cards of patients visiting the Ophthalmology OPD.

b) Lab reports of patients visiting the ophthalmology OPD.

RESULT

Gender Distribution of Ophthalmic Patients

Gender distribution of the patients are enrolled in the study. This results showed that out of 203 patients 104 (51%) were males and 99 (49%) were females.

Table No. 1: Gender Distribution of Ophthalmic Patients

Gender distribution	Number of patients	Percentage (%)
Male	104	51%
Female	99	49%
Total	**203**	**100.00%**

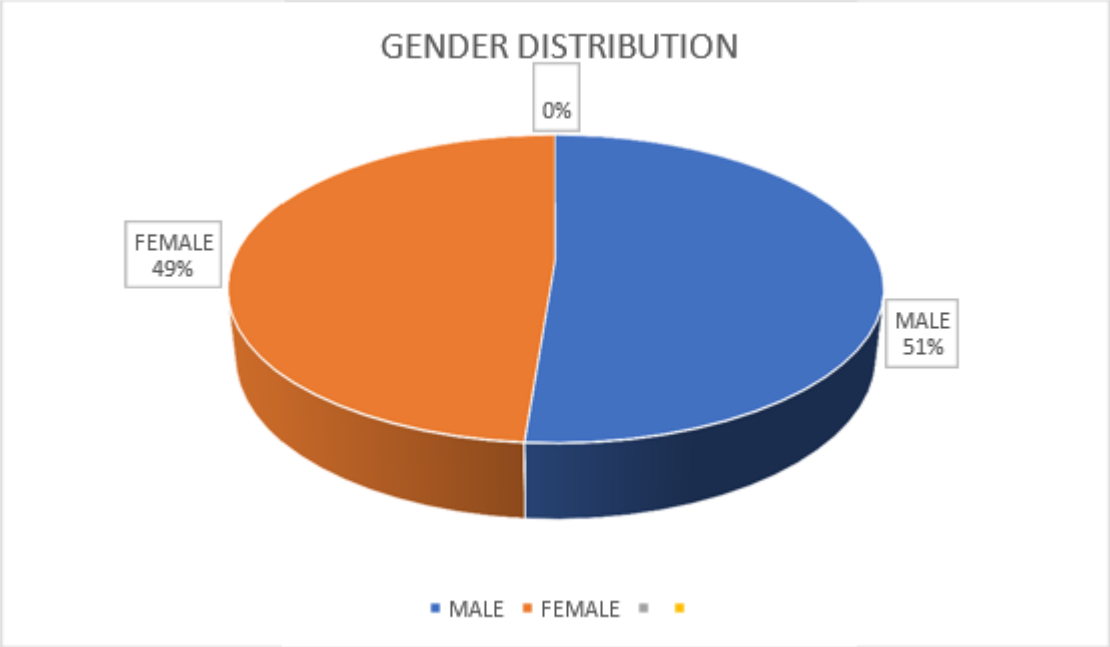

Figure No. 1: Gender distribution of Ophthalmic Patients

NUMBER OF URBAN AND RURAL PATIENTS IN OPHTHALMOLOGY OPD:

A total of 203 prescriptions were collected, out of these 112 patients are fromurban area and 91 patients are from rural area.

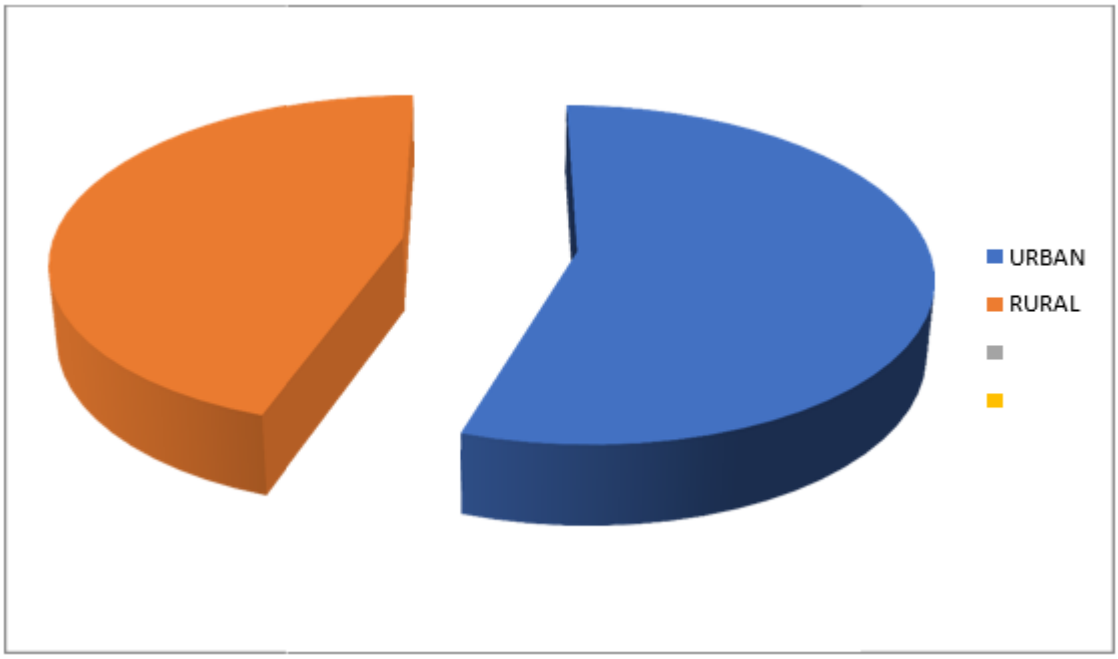

Figure 2: Number of Rural And Urban Patients

Table No. 2: Number of urban and rural patients:

Area	Number of patients	Percentage
Urban	112	55.17
Rural	91	44.83

NUMBER OF DRUGS PER PRESCRIPTION OF OPHTHALMIC OUTPATIENTS:

During this study, a total of 203 prescriptions were analyzed, of these the number of drugs per prescription varied from one to six. Prescriptions containing one drug are 21, two drugs are 100, three drugs are 59, four drugs are 21, five drugs are 2, six drugs are 2.

Table No. 3: Number of Drugs Per Prescription

Number of drugs	Number of prescriptions	Percentage
One	21	10%
Two	100	49%
Three	59	29%
Four	21	10%
Five	02	1%
Six	02	1%

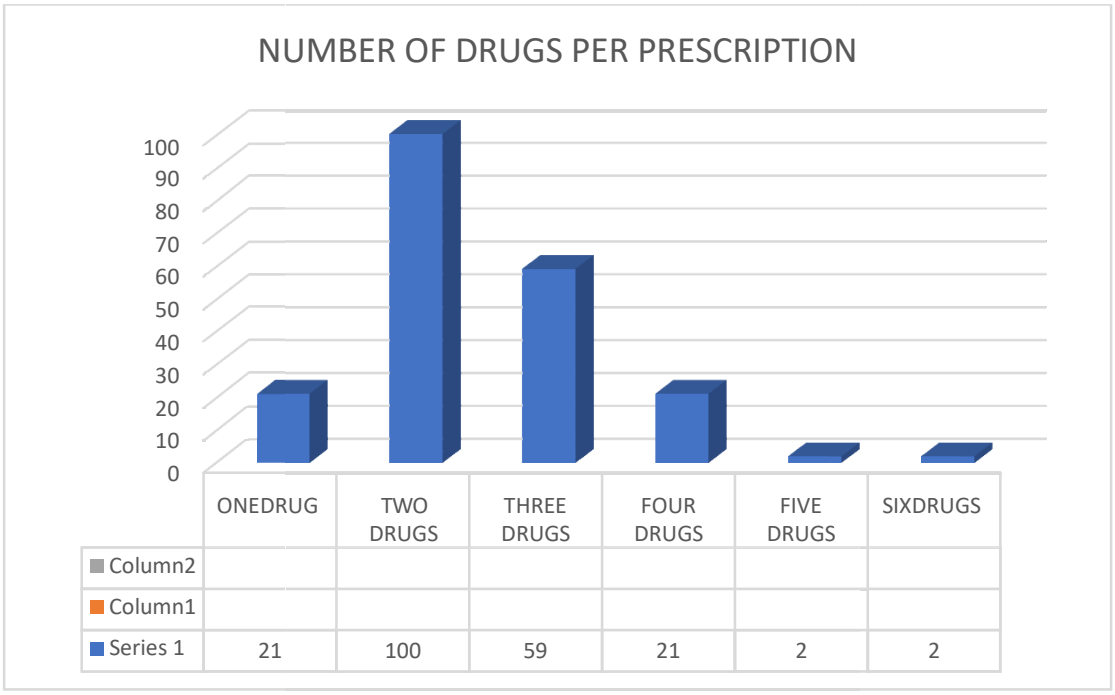

Figure No. 3: Number of Drugs Per Prescription

TYPES OF DOSAGE FORM:

A total number of 203 prescriptions were collected, out of these eye drops are most commonly prescribed (271) dosage form, followed by ointments 100, tablets 91, suspensions 26.

Table No. 4: Types of Dosage Forms

Dosage forms	Number of drugs	Percentage
Eye drops	271	56%
Eye ointments	100	20%
Tablets	91	19%
Suspensions	25	5%

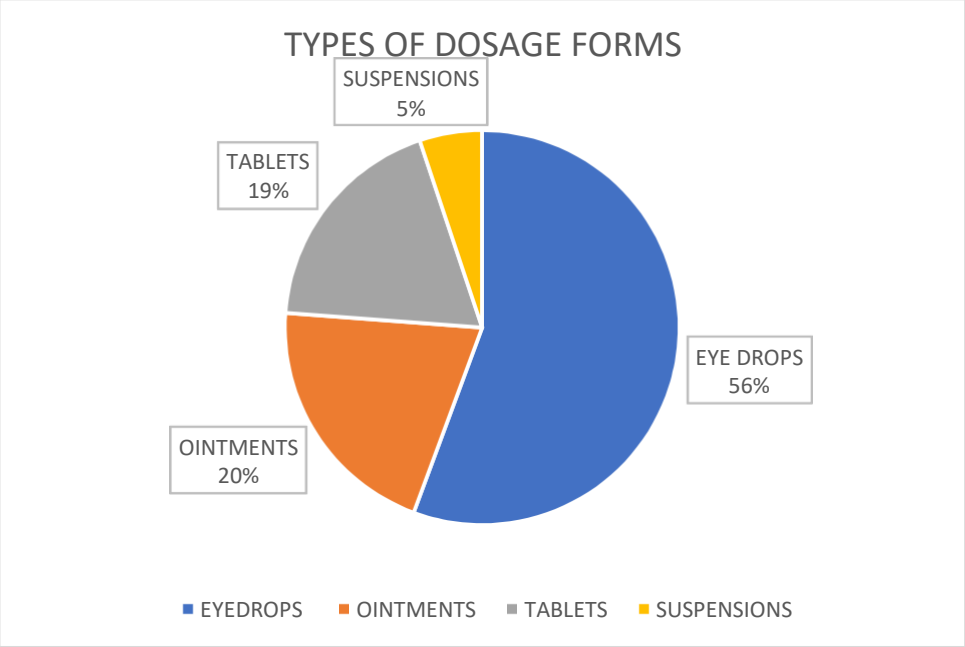

Figure No. 4: Types of Dosage Form

PATTERN OF DIAGNOSIS OF DISEASE IN OPHTHALMIC OUTPATIENT:

Among 203 patients; maximum patients were diagnosed for conjunctivitis i.e; 36, followed by eye foreign body(29), pterygium(23), keratitis(16), chalazion (15), stye (13), chemical injury (12), etc.

Table No. 5: Pattern of Diagnosis of Disease

Types of disease	Number of disease	Percentage
Conjuctivitis	36	17.73%
Foreign body	29	14.2%
Pterygium	23	11.33%
Keratitis	16	07.88%
Chalazion	15	07.38%
Stye	13	06.40%
Chemical injury	12	05.91%
Meibomitis	10	04.92%
Episcleratitis	10	04.92%
Ulcer	07	03.44%
Blepharitis	07	03.44%
Iridocytosis	06	02.97%
Trauma	04	01.97%
Corneal infiltration	04	01.97%
Keratoplasty	04	01.97%
Glaucoma	03	01.47%
Post-op evaseration	03	01.47%
Itching	01	0.49%

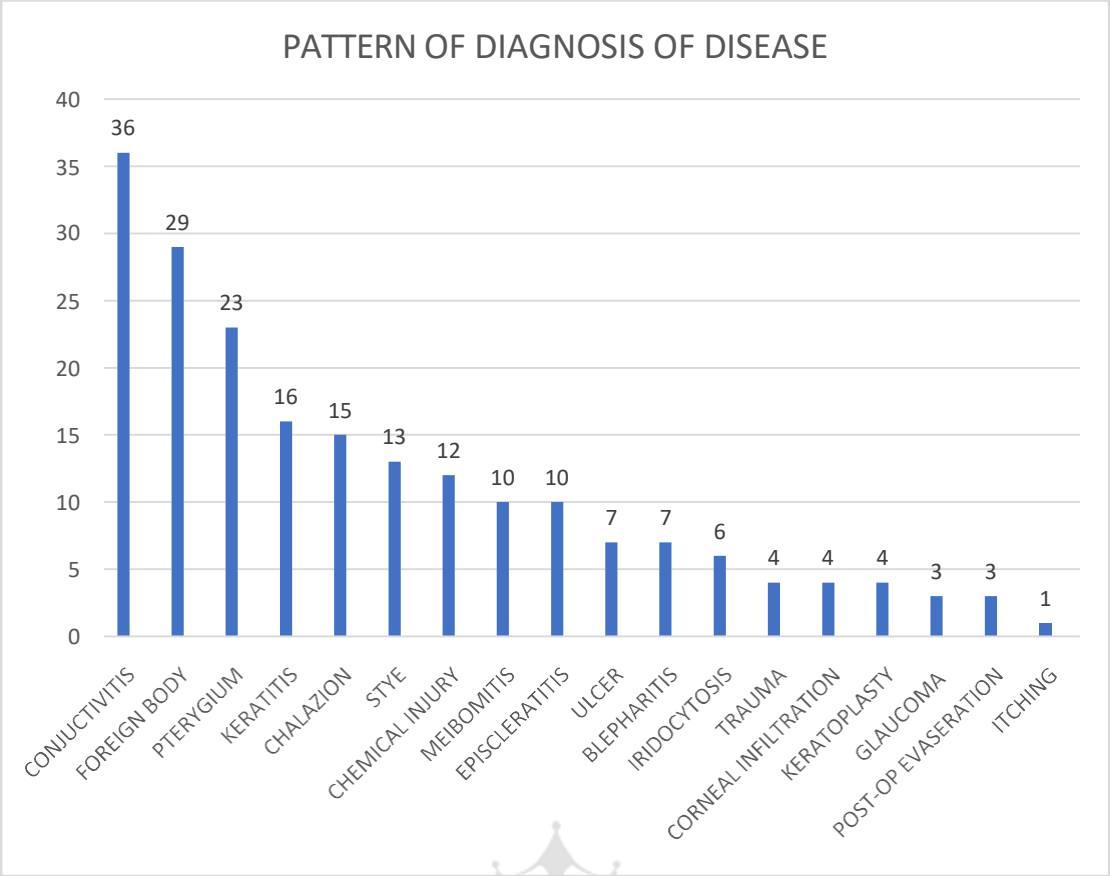

Figure No. 5: Pattern of Diagnosis of Disease

TYPES OF DRUGS PRESCRIBED IN OPHTHALMOLOGY OUTPATENTS

A total of 203 prescriptions were collected, among which most of them were antibiotics, a total of 220 antibiotics were prescribed, followed by lubricants 74, antihistamines 46, NSAIDS 27, steroids 26, antiviral 24, anti-allergic 21, antifungal l6, antacids 16, antihypertensive 4, beta-blockers 4, carbonic anhydrous inhibitors 9, anticholinergic 7, alpha agonists 2, vitamins 2.

Table No. 6: Types of Drugs Prescribed

Type of drugs	Number of drugs	Percentage
Antibiotics	220	45.08%
Lubricants	74	15.16%
Anti histamines	46	9.42%
Nsaids	27	5.53%
Steroids	26	5.32%
Anti viral	24	4.91%
Anti allergic	21	4.30%
Antacids	16	3.27%
Carbonic anhydrous inhibitors	09	1.84%
Anti cholinergic	07	1.43%
Anti fungal	06	1.22%
Anti hypertensive	04	0.81%
Beta blocker	04	0.81%
Alpha agonst	02	0.40%
Vitamins	02	0.40%

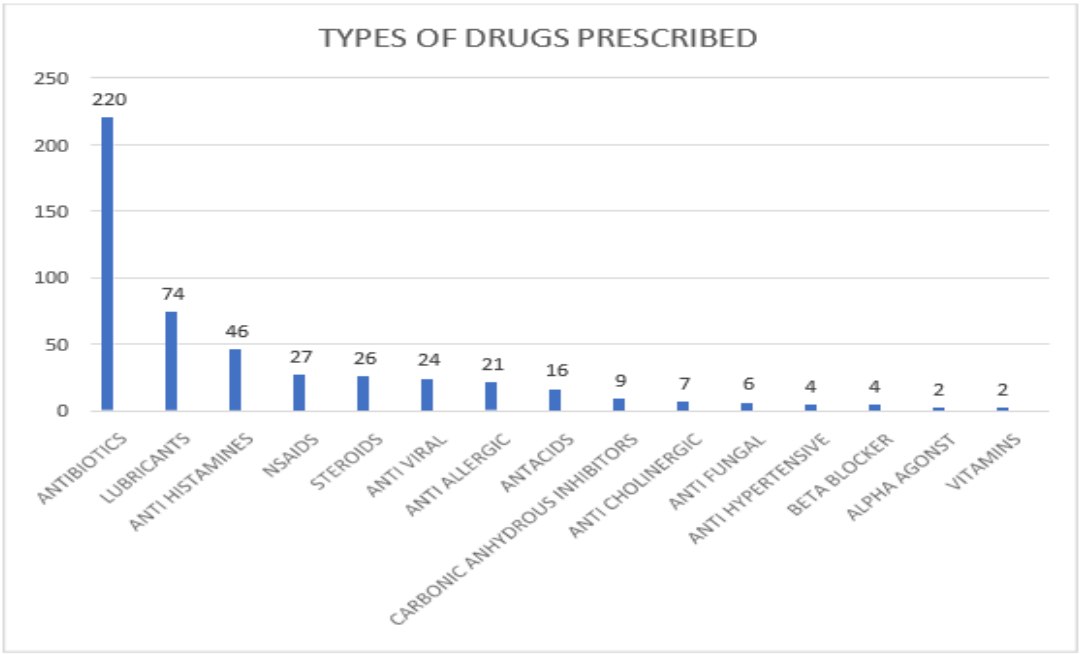

Figure No. 6: Types of Drugs Prescribed

NUMBER OF DRUGS WITH GENERIC AND BRAND NAME:

Out of 203 prescriptions, 385 drugs are prescribed with brand name and 103drugs are prescribed with generic name.

Table No. 7: Number of Drugs with Generic and Brand Name

Type of drug	Number of drugs	Percentage
Brand name	385	78.9%
Generic name	103	21.1%

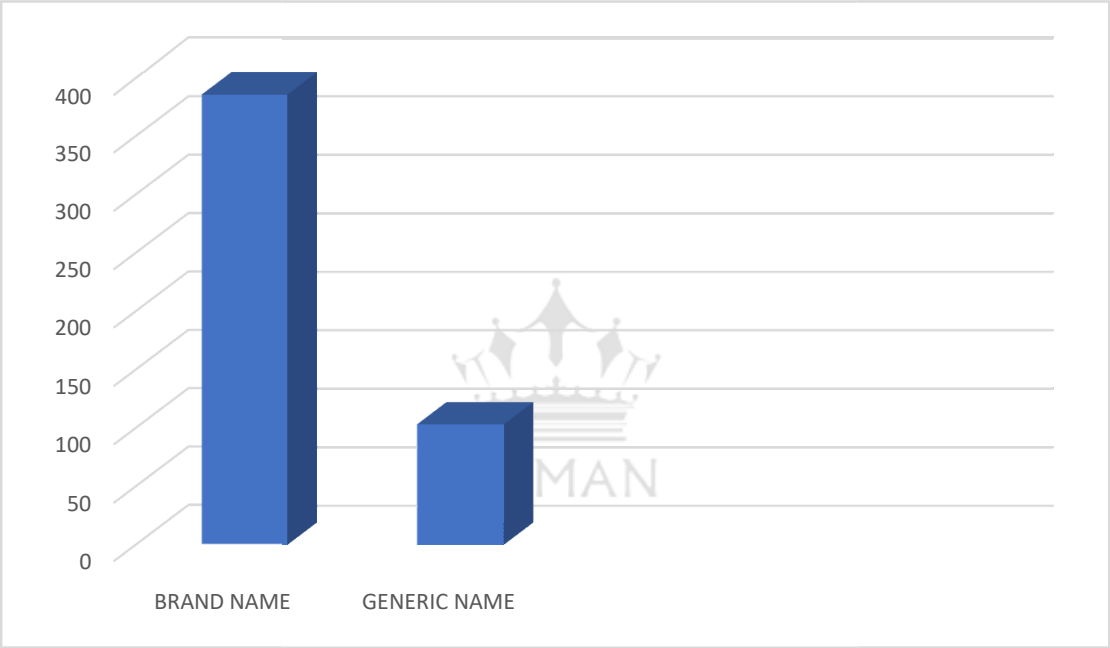

Figure No. 7: Number of drugs with generic and brand name route of administration

ROUTE OF ADMINISTRATION:

Out of 203 prescriptions in the ophthalmology OPD, drugs are administeredonly in two routes i.e; oral and topical. A total of 91 drugs are administered in oralroute and 396 are administered in topical route.

Table No. 8: Route of Administration

Route of administration	Number of drugs	Percentage
Oral	91	18.64%
Topical	396	81.36%

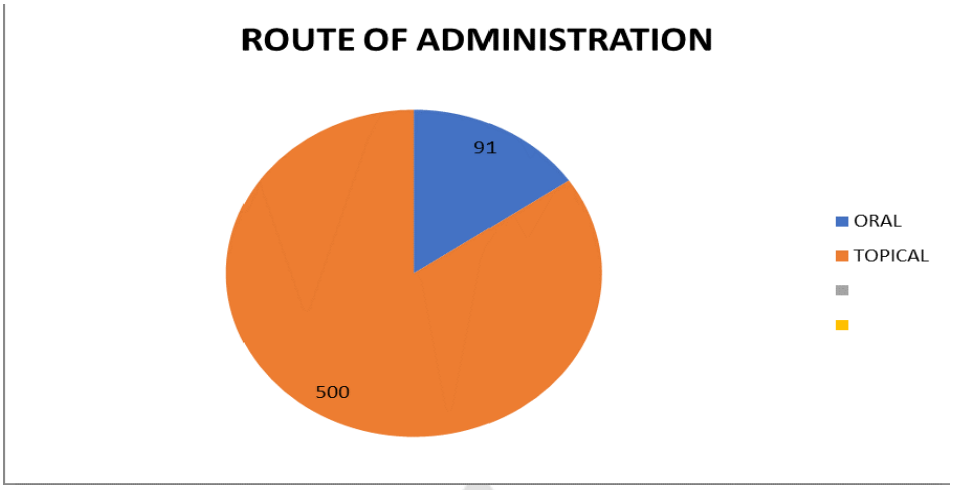

Figure No. 8: Route of Administration

AGE WISE DISTRIBUTION OF OPHTHALMOLOGY OPD PATIENTS:

Age wise distribution of ophthalmology out patients were enrolled in the study. The result showed that 36 patients are of 0-20 years of age, 98 are of 20-40 years, 35 patients are from 41-50 years of age and lastly 34 patients are of greater than 50 years of age.

Table No. 9: Age wise distribution of ophthalmology OPD patients

Age	Number of patients	Percentage
0-20	36	17.73%
21-40	98	48.27%
41-50	35	17.24%
>50	34	16.74%

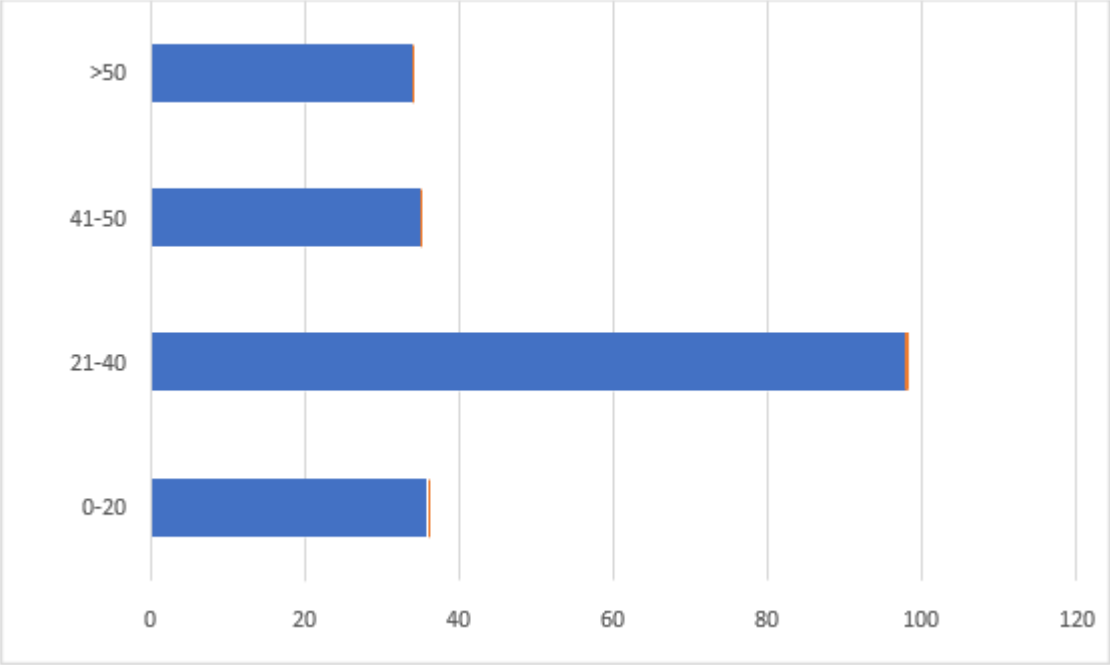

Figure 9: Age wise distribution of the ophthalmology OPD patients

DRUG CORE INDICATORS:

Total No. of Drugs prescribed	488
Number of Drugs Prescribed with Generic Name	103
Number of Antibiotics Prescribed	220
Number of Injections Prescribed	00
Number of Drugs from National Essential list of Medicines	414
Number of Drugs Prescribed with Brand Name	385

DISCUSSION

DETAILS OF PATIENT ENROLLMENT:

A total of 203 patients from the study site were enrolled into the study by considering study criteria. The present study was conducted in ophthalmology outpatient department in Basaweshwar Teaching and General Hospital.

ASSESMENT OF DEMOGRAPHIC CHARACTERISTICS:

GENDER:

Gender distribution of the patients are enrolled in the study. The result showed that out of 203 patients 104 (51%) were males and 99 (49%) were females.

NUMBER OF DRUGS PER PRESCRIPTION OF OPHTHALMIC OUTPATIENTS:

During this study, a total of 203 prescriptions were analyzed, of these the number of drugs per prescription varied from one to six. Prescriptions containing one drug are 21, two drugs are 100, three drugs are 59, four drugs are 21, five drugs are 2, six drugs are 2.

The result showed that an average of 2 drugs are prescribed in an prescription, in the ophthalmology outpatient department.

Our result was similar to the study of Ratnakar UP et al, their result showed that one drug (29.8%), two drugs (46.4%), three drugs (17.9%) and four drugs (6%). The average number of drugs per prescription are 2.

TYPES OF DOSAGE FORM:

In these study, four different types of dosage forms are prescribed. The result showed that a total number of 203 prescriptions were collected, out of these eye drops are most commonly prescribed (271) dosage form, followed by ointments 100, tablets 91, suspensions 26.

Our study result was similar to the study result of Pradeep R Jadav et al., their result showed that drugs were prescribed in four different dosage forms. Eyedrops were the most commonly prescribed (79.51%) dosage form, followed by ointment(15.23%), capsules (2.69%) , and tablets (2.57%).

PATTERN OF DIAGNOSIS OF DISEASE IN OPHTHALMIC OUTPATIENT:

The result showed that a total of 203 patients were diagnosed; of these maximum patients were diagnosed for conjunctivitis i.e; 36, followed by eye foreign body(29), pterygium(23), keratitis(16), chalazion (15), stye (13), chemical injury (12), etc.

Our study result showed similar to the study result of Amit Kumar Jain et al. their result showed that the most common disease diagnosed was conjunctivitis in 290 (29%) patients

followed by Blepharitis 140 (14%), ocular surface disorders 120(12%), dryeye 110(11%), glaucoma 60(6.0%), cornealulcer 50(5.0%), meibomitis 40(4.0%), iridocyclitis 35(3.5%), diabeticretinopathy 30(3.0%), foreignbody 30(3.0%), stye 25 (2.5%), dacryocystitis 20 (2.0%), subconjunctival hemorrhage 15(1.5%).

TYPES OF DRUGS PRESCRIBED IN OPHTHALMOLOGY OUTPATENTS:

A total of 203 prescriptions were collected, among which most of them were antibiotics, a total of 220 antibiotics were prescribed, followed by lubricants 74, antihistamines 46, NSAIDS 27, steroids 26, antiviral 24, anti-allergic 21, antifungal6,antacids 16, antihypertensive 4, beta blockers 4, carbonic anhydrous inhibitors9,anticholinergic 7, alpha agonists 2, vitamins 2.

The study result were similar to the study result of Meenakshi Nehru et al., their result showed that the Antimicrobials were 266(32.36%) given in various dosage forms. Anti-inflammatory and antiallergic drugs were 92 (11.2%), mydriatics and cycloplegics were 64(7.9%), miotics were 20(2.4%) and multivitamins were 58(7.05%).

NUMBER OF URBAN AND RURAL PATIENTS IN OPTHALMOLOGYOPD:

A total of 203 prescriptions were collected, out of these 112 patients are from urban area and 91 patients are from rural area.

NUMBER OF DRUGS WITH GENERIC AND BRAND NAME:

The result showed that, out of 203 prescriptions, 385 drugs are prescribed with brand name and 103 drugs are prescribed with generic name.

ROUTE OF ADMINISTRATION:

The result showed that out of 203 prescriptions in the ophthalmology OPD, drugs are administered only in two routes i.e; oral and topical. A total of 91 drugs are administered in oral route and 396 are administered in topical route.

AGE WISE DISTRIBUTION OF OPHTHALMOLOGY OPD PATIENTS:

Age wise distribution of ophthalmology out patients were enrolled in the study. The result showed that 36 patients are of 0-20 years of age, 98 are of 20-40 years, 35 patients are from

41-50 years of age and lastly 34 patients are of greater than 50 years of age.

DRUG CORE INDICATORS

According to the WHO drug core indicators, the total number of drugs prescribed were 488. Of these 488 drugs, 103 are with generic name and 385 are with brand name. Total antibiotics prescribed were 220.

CONCLUSION

In the research study we have assessed the drug utilization among ambulatory patients visiting ophthalmology outpatient department.

We conclude that drugs prescribed using generic name were low as majority of drugs were prescribed using brand name and this increases the economic burden so the practice of generic prescribing needs to be improved. The average number of drugs per prescription is 2. This shows that polypharmacy was low and rational prescribing was achieved. The prescribing pattern observed in the current study was knowledge based and the study shows selection of essential drugs from National essential drug list (NEDL). Out of 488 drugs, a total of 414 drugs were prescribed from National essential drug list (NEDL).In our study, Antibiotics prescribed were 45.08% and most of them were prescribed in the form of eye drops thus, minimizing the adverse effects. It is always preferred to have a complete prescription which should include name, age, sex, diagnosis and rational drug treatment with less number of drugs, and the proper dosage form. Our hospital based prescriptions were almost complete in 75%of cases. There is need to conduct similar studies in other departments, as well to audit a large number of prescriptions for the benefits and safety of patients.

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ANNEXURE MASTERCHART

Sr. No.	OP Number	GENDER	AGE	DIAGNOSIS
1	424145	M	22	HSV Keratitis
2	425552	F	33	Episcleratitis
3	426533	F	35	Corneal FB
4	426685	F	50	Corneal ulcer
5	428366	F	22	Corneal FB
6	427501	F	48	Viral Keratitis
7	427607	M	29	Conjunctival FB
8	428212	M	20	Veneralkerato conjunctivitis
9	427268	F	27	Keratoplasty
10	429800	M	22	Stye
11	420746	F	12	Vernelkeratocojuctivits
12	428738	M	58	Keratoplasty
13	428905	M	7	Trauma
14	429754	M	40	Post op evisceration
15	430264	M	20	Corneal FB
16	431828	F	40	Corneal Infiltration
17	431736	M	7	Trauma
18	431810	F	74	Corneal fungal ulcer
19	432790	F	25	Viral keratitis
20	438192	F	42	Nasal pterygium
21	438149	F	55	Chemical Injury
22	437118	M	23	Allergic Conjunctivitis
23	437091	F	40	Allergic conjunctivitis
24	438587	F	45	Progressive Pterygium
25	438113	F	14	Corneal FB
26	439806	M	53	Glaucoma
27	442575	M	16	Corneal FB
28	442569	F	11	Trauma
29	442590	M	42	Post op Evasiration
30	446668	M	47	Chemical Injury
31	447258	M	45	Stye
32	447613	F	20	Viral keratitis
33	451166	F	32	Acute iridocytosis
34`	449872	F	35	Allergic Conjunctivitis
35	454394	M	28	Progressive pterygium
36	454389	F	28	Pterygium
37	457741	M	55	Conjunctivitis
38	457712	F	47	Pterygium
39	457725	M	15	Corneal FB
40	447347	F	42	Episcleratitis
41	450572	F	18	Corneal FB
42	448245	M	56	Episcleratitis
43	466927	M	30	Corneal FB
44	464916	M	23	Stye
45	466948	F	63	Viral conjunctivitis

46	461668	M	25	Corneal FB
47	448023	F	27	Stye
48	461567	M	34	Conjunctival FB
49	464384	F	68	Progressive pterygium
50	25689	F	28	Corneal Ulcer
51	475604	F	22	Corneal FB
52	21305	M	40	Meibomitis`
53	473112	F	56	Progressive pterygium
54	32742	M	41	Chemical injury
55	126775	M	27	Meibomitis
56	462133	M	21	Inflamed pterygium
57	437011	F	23	Allergic conjunctivitis
58	471042	F	19	Bacterial conjunctivitis
59	32730	M	56	Glaucoma
60	32770	M	70	Glaucoma
61	22066	M	13	Chalazion
62	27952	M	29	Nasal pterygium
63	25884	M	32	Acute iridocytosis
64	21563	F	25	Stromal keratitis
65	22846	M	17	Blepharitis
66	21717	F	45	Progressive pterygium
67	23104	M	29	Meibomitis
68	23304	M	64	Corneal FB
69	24024	M	5	Allergic conjunctivitis
70	23313	M	18	Conjunctival FB
71	25739	F	50	Viral conjunctivitis
72	25996	M	27	Stye
73	30812	M	37	Corneal fungal ulcer
74	25815	F	50	Bacterial conjunctivitis
75	25987	F	23	Episcleratitis
76	25100	M	55	Corneal FB
77	24904	F	65	Evisceration
78	25926	M	24	Stye
79	33827	F	8	Blepharitis
80	24414	F	63	Chalazion
81	24015	F	35	Keratoplasty
82	27013	M	70	Corneal fungal ulcer
83	23045	M	31	Chalazion
84	25879	F	32	Episcleratitis
85	29653	F	50	Chemical injury
86	32323	F	23	Stye
87	33811	M	42	Allergic conjunctivitis
88	41802	M	54	Conjunctival FB
89	41273	F	60	Stye
90	38155	M	21	Blepharitis
91	41648	F	25	Nasal pterygium
92	36747	M	25	Episcleratitis
93	36758	F	18	Viral conjunctivitis

94	41807	F	30	Nasal pterygium
95	36757	F	20	Episcleratitis
96	36750	M	55	Bacterial conjunctivitis
97	41972	M	25	Chalazion
98	43204	F	29	Episcleratitis
99	42718	M	20	Conjunctival FB
100	42713	F	25	Corneal FB
101	44709	F	21	Viral keratitis
102	35798	M	32	HSV Keratitis
103	44745	F	55	Conjunctivitis
104	43718	M	46	Conjunctivitis
105	45245	M	40	Meibomitis
106	45246	F	25	Blepharitis
107	45821	M	40	Allergic conjunctivitis
108	42703	M	23	Chemical injury
109	50149	M	20	Episcleratitis
110	55026	F	42	Conjunctival FB
111	50148	M	36	Chalazion
112	50047	M	22	Corneal FB
113	36760	F	29	Viral keratitis
114	43453	F	40	Viral conjunctivitis
115	50161	F	35	Chalazion
116	473526	M	60	Itching
117	28442	M	55	Meibomitis
118	20255	M	25	Viral keratitis
119	472014	M	50	Viral keratitis
120	19964	M	40	Chemical injury
121	461209	F	38	Trauma
122	22428	M	12	Alkali injury
123	20091	M	23	Chalazion
124	26926	M	16	Blepharitis
125	26929	M	20	Blepharitis
126	19712	F	44	Acute Iridicytosis
127	20280	F	20	Acute iridocytosis
128	27237	F	25	Nasal pterigium
129	33813	M	22	Nasal pterigium
130	471903	M	02	Bacterial conjuctivitis
131	39066	M	18	Chemical injury
132	125927	F	50	Chemical injury
133	126890	M	25	Corneal FB
134	123906	F	50	Progressive pterygium
135	122141	F	20	Nasal pterigium
136	122895	F	21	Nasal pterigium
137	122663	M	45	Inflammedpterygium
138	121369	M	32	Nasal pterygium
139	119465	F	22	Nasal pterygium
140	121578	M	67	Meibomitis with pterygium
141	123988	F	31	Chalazion

142	121316	F	28	Meibomitis
143	126937	F	50	Allergic conjuctivitis
144	120240	M	55	Allergic conjuctivitis
145	124391	M	25	Allergic conjuctivitis
146	121961	F	21	Viral conjuctivitis
147	121348	M	52	Viral conjuctivitis
148	127920	M	68	Conjuctival FB
149	119408	F	20	Conjuctival FB
150	120444	F	35	Stye
151	123977	M	69	Viral keratitis
152	120520	M	25	Chemical injury
153	121358	F	01	Microbial keratitis
154	127972	M	62	Corneal ulcer
155	123014	F	32	Acute iridocytosis
156	126622	F	35	Acute iridocytosis
157	125290	M	37	Progressive pterygium
158	124780	M	45	Bacterial conjuctivitis
159	125307	M	22	Chemical injury
160	125614	M	50	Viral keratitis
161	125972	F	22	Stye
162	125159	M	22	Stye
163	124493	M	18	Allergic conjuctivitis
164	126615	F	35	Allergic conjuctivitis
165	126645	M	18	Allergic conjuctivitis
166	125353	M	52	Conjuctival FB
167	125285	M	28	Chalazion
168	125943	F	30	Chalazion
169	125281	F	35	Conjuctival FB
170	114937	M	18	Conjuctival FB
171	114934	M	32	Stye
172	114921	F	48	Chalazion
173	115072	M	28	Allergic conjuctivitis
174	115644	M	41	Meibomitis
175	116543	M	42	Corneal infiltration
176	114104	M	39	Nasal pterygium
177	114109	F	48	Episcleratitis
178	114027	M	38	Chemical injury
179	115436	M	38	Conjuctival FB
180	114098	F	42	Stye
181	114033	F	32	Chalazion
182	114093	M	54	Chalazion
183	115558	F	15	Chalazion
184	115421	F	09	Blepharitis
185	115552	F	29	Corneal infiltration
186	116490	M	38	Allergic conjuctivitis
187	115679	F	22	Conjuctival FB
188	115624	M	46	HSV keratitis
189	115610	F	52	Chemical injury

190	115423	F	34	Corneal infiltration
191	115325	F	22	Exposure keraotoplasty
192	115750	M	25	HSV keratitis
193	116721	M	15	Viral conjuctivitis
194	115674	M	42	Conjuctival FB
195	116846	F	34	Meibomitis
196	117577	M	35	Chalazion
197	117375	M	25	Allergic conjunctivitis
198	117570	M	42	Viral conjunctivitis
199	117703	F	54	Viral conjunctivitis
200	117578	M	46	Progressive pterygium
201	117591	M	57	Meibomitis&stye
202	117725	F	45	Allergic conjunctivitis