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

Human Journals
Research Article
January 2021 Vol.:20, Issue:2

A Study on Drug Prescribing Pattern and Disease Pattern of Inpatients Visiting Ophthalmology Department in a Rural Tertiary Care Teaching Hospital

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Submitted: 10 December 2020
Revised: 30 December 2020
Accepted: 20 January 2021

HUMAN JOURNALS
www.ijppr.humanjournals.com

Keywords: Inpatient, Ocular Disease, Cataract, Pterygium, Rational Drug Use, Blindness

ABSTRACT

AIM: To study the drug prescribing pattern and disease pattern of inpatients visiting the ophthalmology department at Adichunchanagiri Hospital and Research Centre (AH&RC), B.G Nagara, Mandya. **METHODS:** A total number of 183 prescriptions were collected through a specially designed data collection form and analyzed for no of drugs per prescription, the total number of drugs prescribed, disease pattern, number of drugs prescribed with a generic name and brand name, types of dosage form prescribed, number of drugs from WHO EML. **RESULTS:** Prescription analysis resulted that 871 drugs were prescribed in 183 prescriptions, the average number of drugs per prescription was 4.76, none of the drugs prescribed in generic name, the maximum number of drugs per prescribed with tablets 416, followed by eyedrops 360, injections 92, syrup 2, and 1 suppository. Out of 183 inpatients 174 patients were diagnosed with cataracts. Out of 871 drugs 494 drugs were prescribed as per the list of WHOEML. **CONCLUSION:** The prescribing pattern observed in the current study was knowledge-based and following the accepted patterns of treatment of ocular diseases, but the study showed ample scope for improvement in encouraging the ophthalmologists to prescribed by generic name and selection of essential drugs from WHOEML/NEDL/NFI. The study revealed that prescription writing errors were minimum.

INTRODUCTION

We substantially rely on our eyes in everyday life, yet this organ has been neglected in terms of medicine. Most if retinal diseases have no early warning signs or symptoms but, a dilated exam can detect eye diseases in their primary stages before vision loss occurs. All parts of the eye can 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 infections are considered to be a minor infection, it can be "vision-threatening"[1]. Retinal disease has very less priority in the prevention of blindness programs in developing countries mainly because eye problems were considered as a rare cause of blindness in the developing world. Even though the effort and expense involved in acquiring costly equipment and developing skilled human resource for retinal specialty, failure in justifying the treatment results of eye disease has also contributed to the development and nourishing of this assumption.

In recent times, there has been a gradual increase in the burden of retinal disorders globally. With increased longevity and rising of cataract surgical services, retinal diseases especially those due to diabetes and age-related macular degeneration are coming up as important causes of blindness and visual impairment[2]. The average person might have a difficult time keeping track of the numerous ocular diseases and associated symptoms, a person may focus on a few of the more common signs of ocular problems. Knowing some of the symptoms of common eye conditions may encourage to seek an eye examination if you exhibit signs of eye deterioration or disease[3].

However, the trends of ocular diseases vary all over the world and besides influenced by racial, geographic, socio-economic, and cultural factors. The common ocular diseases throughout are cataract, uveitis, glaucoma, conjunctivitis, corneal ulcers, refractive errors, and pterygium[4]. Even though of the efforts and expenses involved in acquiring costly equipment and developing skilled human resources for ocular specialty, failure in justifying the treatment results of eye diseases has also contributed to the development and nourishing of this assumption[1,3].

In India, cataract has been reported to be the main cause for 50-80% of the bilaterally blind in our country. The modern estimates from World Health Organization (WHO) reveal that 47.8% of global blindness is due to cataract, and in south Asia region which 51% of blindness is due to cataract. In India, cataract is the main cause of blindness accounting for 62.6% cases

of blindness[4]. Hence, awareness and knowledge of common eye diseases play an important role in encouraging people to seek treatment for eye problems. This helps in reducing the burden of visual impairment among the population in a society. Visual health education encourages people to ask for consultation from an ophthalmologist.

A major advantage in ocular diseases is that in comparison to other parts of the central nervous system, drug delivery can be more targeted using either drops applied to the surface of the eye and some of the injections made directly into the eye. These routes of targeted drug delivery minimize systemic & toxic effects and therefore enhance therapeutic indices. In ophthalmic diseases, indiscriminate use of topical nonsteroidal anti-inflammatory drugs, antibiotics, and other drugs can result in many adverse effects such as local irritant effects, damaging the conjunctiva, cornea, and even severe antibiotics witnessed various changes day by day, especially in the past 20–30 years. Long term use of ocular antibiotics cause scarring of the conjunctiva and dry eyes. Microbial resistance to antibiotic agents is increasingly day by day prevalent in ocular infections. Past 2-3 decades have witnessed changes in antibiotic susceptibility patterns on a worldwide basis. Guidelines has been developed to help slow the escalation of systemic antibiotic resistance and to encourage prudent use of antibiotics also apply to the management of ocular infections[1,4].

The pursuit of proper and superintend use of medicines in the basis for concept and effort for the rational use of drug (RUD). World Health Organization (WHO) defined RUD as "Medicine use is rational, when patients receive the appropriate medicines, in doses that meet their own individual requirements, for an adequate period, and at the lowest cost both to them and the community. Irrational use of medicines is when one or more of these conditions is not met." Drug utilization studies gives a sound basis for better healthcare decisions for society and country at large. Drug Utilization studies are the marketing, distribution, prescription and use of drugs in a society with special emphasis on the resultant medical and social consequences as defined by WHO. Hence periodic auditing of drug prescribing patterns is vital tool for the promotion of RUD that will improve the therapeutic efficacy, decrease the adverse drug reaction and cost effectiveness[5].

To investigate the rational use of drugs, WHO have established few core indicators, where prescribing indicators are one of them. Prescribing indicators include study of 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)[5,6].

OBJECTIVES

PRIMARY OBJECTIVE

To study the drug prescribing pattern and disease pattern inpatients visiting ophthalmology department at Adichunchanagiri Hospital and Research Centre (AH&RC), B.G Nagara, Mandya.

SECONDARY OBJECTIVES

- To explore the knowledge and awareness on drug prescribing pattern and disease pattern in the ophthalmology department.
- To study percentage of drugs prescribed from the essential medicine list (EML).
- To identify ADR, if any.
- To identify drug interaction, if any.

STUDY CRITERIA

Inclusion criteria

All patients who were willing to participate after getting the written informed consent & attending the ophthalmology department of the hospital was included in the study.

Exclusion criteria

Those patients who are not willing to participate in the study.

METHODOLOGY

"The study was a Prospective Observational Study". The study was carried out for a period of 6 months from October 2019- April 2020. The study was approved by institutional Ethical Committee, AH&RC, B G Nagara, (ENo; AIM/IEC/200/2019-20). Considering the inclusion and exclusion criteria subject was enrolled to the study after procuring the written consent individually. The suitably designed data collection form was used to collect all the necessary information. The participants were explained well about the study before taking their data and

cleared all their doubt about the study. The collected data was transcript into excel spreadsheet for calculation. Suitable statistical method was used for the analysis of the data obtained. The data was entered in Microsoft excel. The statistical analysis was performed using SPSS V.22. The descriptive statistical method including frequency, mean, mode &median was determined for the socio-demographic details.

RESULTS

A STUDY ON DRUG PRESCRIBING PATTERN AND DISEASE PATTERN OF PATIENTS VISITING OPHTHALMOLOGY IN PATIENT DEPARTMENT

Socio-demographic characteristics of the participants in ophthalmic inpatients (N= 183)

A total of 183 prescriptions were analyzed. The mean age of the subject was 62.96 years (SD10.337) out of these male patients were 88 and female patients were 95 and Age-wise distribution of ophthalmology in patients were enrolled in the study the result showed that 1 patient of 1-10 years of age, 1 patients are from 20-30 years of age,5 patients are from 31-40 years of age, 13 patients from 41-50 years of age, 57 patients of 51-60 years of age and lastly 107 patients are of greater than 60years of age.

Table No 1: Socio- Demographic Characteristics of the Participants In Ophthalmic Inpatients

AGE IN YEARS	NO OF PARTICIPANTS	PERCENTAGE
0-10	1	0.55%
11-20	0	0%
21-30	1	0.55%
31-40	5	2.72%
41-50	13	7.1%
51-60	57	31.13%
61-70	77	42.1%
71-80	28	15.3%
81 ≤	1	0.55%
Sex		
Male	88	48.1%
Female	95	51.9%

Mean age: 62.96 SD ± 10.337 (N= 183)

No. of drugs per prescriptions of ophthalmic Inpatients.

During this study, a total no. of 183 prescriptions was analyzed. Out of these prescriptions the no. of drugs per prescription varied from 1-6. Prescription containing 6 drugs were 38, 5 drugs are 41, 4 drugs are 100, 3 drugs in 2. There were 1 and 2 drugs were given in each of the prescriptions.

Table No. 2: No of Drugs Per Prescriptions of Ophthalmic Inpatients

PRESCRIPTION CONTAINING NUMBER OF DRUGS	NUMBER OF PRESCRIPTIONS	NUMBER OF PRESCRIPTION (%)
1.00	1	.5
2.00	1	.5
3.00	2	1.1
4.00	100	54.6
5.00	41	22.4
6.00	38	20.8
Total	183	100.0

No. of dosage forms prescribed per prescription in ophthalmic inpatients

Out of 183 prescriptions, the maximum no. of dosage form for a prescription is 4 and the minimum no. of the dosage form is 1. Single dosage form of drug was prescribed in 2 patients, 2 dosage form of drugs were prescribed in 124 prescriptions and 3 dosage form of drugs were prescribed in 56 and 4 dosage form of drugs was prescribed for single prescription.

Table No. 3: No. of Dosage Forms Prescribed Per Prescription In Ophthalmic Inpatients

NO OF DOSAGE FORMS PRESCRIBED PER PRESCRIPTIONS	NO. OF PRESCRIPTIONS	PERCENT
1.00	2	1.1
2.00	124	67.8
3.00	56	30.6
4.00	1	.5
Total	183	100.0

Types of dosage forms prescribed for ophthalmic inpatients

A total no. of 183 prescriptions were collected out of these tablets are most commonly prescribed dosage form 416, followed by eye drops 360, injections 92, syrup 2 and 1 suppository.

Table No. 4: Types of Dosage Forms Prescribed For Ophthalmic Inpatients

DOSAGE FORMS	NO. OF DRUGS	PERCENTAGE
Eye drops	360	41.33
Tablets	416	47.76
injection	92	10.56
Syrups	2	0.229
suppository	1	0.114

Pattern of diagnosis of disease in ophthalmic Inpatients

Among 183 patients of data collected 174 patients were diagnosed for cataract and 6 patients were diagnosed with Pterygium and 1 patient was diagnosed for right eye scleritis and 1 patient was diagnosed with choroidal and 1 patient was diagnosed for laceration of lid.

Table No. 5: Pattern of Diagnosis of Disease in Ophthalmic Inpatients

OCULAR DISEASES	NO OF PRESCRIPTIONS	PERCENT
CATARACT	174	95.1
CHOROIDAL NEOVASCULAR MEMBRANE	1	.5
LACRATION OF LID	1	.5
PTERYGIUM	6	3.2
RE SCLERITIS	1	.5
Total	183	100.0

The below table shows the age group distributed according to the diagnosis. Most of them were above 50 years of age almost all of them were diagnosed with cataract.

Table No 5.1: Age Wise Distribution of Diseases in Ophthalmology Inpatients

AGE GROUP	CATARACT	CHOROIDAL NEOVASCULAR MEMBRANE	LACRATION OF LID	PTERYGIUM	RE SCLERITIS	TOTAL
1-10	**0**	**0**	**0**	**0**	**1**	**1**
10-20	**0**	**0**	**0**	**0**	**0**	**0**
21-30	**0**	**0**	**1**	**0**	**0**	**1**
31-40	**5**	**0**	**0**	**0**	**0**	**5**
41-50	**11**	**0**	**0**	**2**	**0**	**13**
51-60	**54**	**0**	**0**	**4**	**0**	**58**
61-70	**77**	**0**	**0**	**0**	**0**	**77**
71-80	**26**	**1**	**0**	**0**	**0**	**27**
81<	**1**	**0**	**0**	**0**	**0**	**1**
TOTAL	**174**	**1**	**1**	**6**	**1**	**183**

Classes of drugs prescribed in ophthalmology inpatients

A total of 183 prescriptions were collected among which most of them were antibiotics, a total no. of 290 antibiotics were prescribed followed by NSAID 238, cycloplegics 133, anti-glaucoma 2, Steroids 92, artificial tears 4.

Table No. 6: Classes of Drugs Prescribed in Ophthalmology in Patients

CLASS OF A DRUG	NO. OF DRUG	PERCENTAGE
Antibiotics	362	41.57%
NSAID	278	31.91%
Cycloplegics	133	15.27%
Anti-glaucoma	2	0.23%
Artificial tears	4	0.46%
Steroids	92	10.56%
total	871	100%

Route of administration of drugs prescribed for ophthalmology inpatients

Out of 183 prescriptions in ophthalmology inpatient drugs are administered only in Four routes i.e.; oral and topical and IV and Rectal. A total of 360 drugs are administered in topical route and 418 are administered in oral route etc.

Table No.7: Route of Administration of Drugs Prescribed For Ophthalmology Inpatients

ROUTE OF ADMINISTRATION	NO. OF DRUGS	PERCENTAGE
Oral	418	48%
Topical	360	41.33%
IV	92	10.56%
Rectal	1	0.11%
Total	871	100%

Drug core indicators

Table No. 8: Age Wise Distribution of Ophthalmology in Inpatients

Total no of prescriptions	183
Average no of drugs per prescription	4.76
Total no of drugs prescribed	871
Total no of drugs prescribed in generic name	0
Total no. of drugs prescribed in brand name	871
No. of antibiotics prescribed	362
No. of drugs from WHO EML	494
No. of injections prescribed	92

Prescription Parameter

In all 184 prescriptions, all the essential parameters like:

1. Type of dosage form
2. Duration of therapy
3. Frequency of administration of drugs

Were completely mentioned in all prescription.

DISCUSSION

DETAILS OF PATIENT ENROLLEMENT

A total of 183 outpatients from the study site were enrolled in the study by considering study criteria. The present study was conducted in Ophthalmology Department of Adichunchanagiri Hospital and Research Centre.

ASSEMENT OF DEMOGRAPHIC CHARATERISTICS

Gender distribution of patients is enrolled in the study. A total no. of and 183 prescriptions were analyzed from the ophthalmology inpatient department. The result showed that out of 183 patients, majority of them are female 95 and male patients were 88. Health problems such as diabetes and blood pressure are most seen in women than in male, so these problems are directly linked with ophthalmic problems.

NO. OF DRUGS PER PRESCRIPTION

A lower no. of drug per prescription indicates less chance of drug interaction, less chances of ADR and better compliance, indirectly it is also indicating more chances of correct diagnosis. The average no. of drug per prescription is an important index as it tends to measure polypharmacy. During the study period a total no. of 183 prescriptions were analyzed in the ophthalmology inpatient department, out of these no. of drugs per prescription varied from 1-6 the prescription containing one drug are 1, two drugs are 1, three drugs are 2, four drugs are 100, five drugs are 41, six drugs are 38.

The result showed that average no. of 4.76 drugs are prescribed in ophthalmology inpatient department. Our study was similar to Neelkantreddypatil *et.al.*[1], there study shows that no. of prescription varied from 1-6 prescription containing one drug are 21, two drug are 100, three drug are 59, four drug are 21, five drug are 2 and six are 2 and average no. of drugs per prescription are 2.[9]Average should always maintain low as possible to reduce adverse effect, bacterial resistance level and patient medication cost range. It shows the degree of Polypharmacy and average value ranges from1.6 to 1.8%. The prescribing error should be low by maintaining the average number and the appropriate use of drugs and drug prescribing pattern will increase the patient benefits in several aspect and also health of public.

TYPES OF DRUGS PRESCRIBED IN OPHTHALMOLOGY OUT PATIENTS

In our study there were 5 different types of dosage forms are prescribed in ophthalmology inpatient department. The result showed that a total no. of 183 prescriptions are collected out of these most commonly prescribed are tablets 416, followed by 360 eye drops and 42 injections, 2 syrups and 1 suppository .

Our results are similar to Bhadury T *et.al*[8]. There results showed that drugs were prescribed in 6 different dosage form with eye drops being the most common 70.8% followed by tablets 50.9%, ointments 6.1%, syrup1.1%, capsule 3.9% etc.

Pattern of diagnosis of ophthalmic patients

In ophthalmology inpatients, 183 prescriptions were analyzed out of that Cataract was most commonly diagnosed disease 174 followed by Pterygium 6 etc.

Comparing our result to Amit Kumar Jain *et.al*.[7] Their result showed that the most common disease diagnosed was Conjunctivitis in 290(29%) patients followed by Blepharitis 140(14%), Ocular Surface Disorder 120(12%), dry eye 110(11%), glaucoma 60 (6.0%) etc.

Types of drugs prescribed in ophthalmology outpatients

For ophthalmology inpatients antibiotics 362 were commonly prescribed followed by NSAID 278, cycloplegics 133, steroids 92, artificial tears 4 and anti-glaucoma 2.

While comparing our results to Rajesh Kumar suman *et.al*.,[9] found to be similar to our study wherein their study antibiotics were in the 14.69%, antiviral was 4.12%, antihistamine are 49.14%, steroids were 11.98% followed by anti-inflammatory are in 6.04% and at last artificial tears were in 22.23%.

Eye drops most commonly prescribed dosage form for ophthalmology treatment mainly all types of dosage groups such as antibiotic, steroids, artificial tear and anti-glaucoma drugs are mainly prescribed in drops form for eye diseases. NSAIDs and vitamins mainly prescribed in tablet form and antibiotics are mainly prescribed in ointment and gel form, vitamins are prescribed in capsules or tablet form.

No. of drugs with generic name and brand name

In ophthalmology inpatients in all the 183 prescriptions all the drugs were in brand name and none of the drugs were prescribed in the generic name this shows that more the frequency of prescribing the drugs in brand name leads to the popularity of brands this may result in misinterpretation of sound alike and look alike drugs.

PARAMETERS

The most important parameters/essential prerequisites which are mandatory prescription are the route of administration, duration of therapy and frequency of administration which when not adequately included in a prescription may go against the drug manufacturing criteria's such as standard bioavailability, half-life and other pharmacokinetic parameters resulting in ADRs which may also be due to misinterpretation of route of administration, duration of therapy and frequency of administration (poor medication adherence).

All the prescriptions in our study contain all these essential prerequisites. Out of 871 drugs prescribed, 494(56.71%) drugs were prescribed from the WHOEML.

CONCLUSION

A total of 183 patients from the study site were enrolled in the study, out of these no. of drugs per prescription varied from1-6 the prescription containing one drug are 1, two drugs are 1, three drugs are 2, four drugs are 100, five drugs are 41, six drugs are 38. The results showed that average no. of 4.76 drugs are prescribed in the ophthalmology inpatient department. This value shows poly pharmacy was less. There were 5 different types of dosage forms are prescribed in the ophthalmology inpatient department tablets are most commonly prescribed 416, followed by 360 eye drops and 42 injections, 2 syrups and 1 suppository. In 183 prescriptions, Cataract was most commonly diagnosed disease 174 followed by Pterygium 6 etc. For management of these diseases antibiotics 362 were commonly prescribed followed by NSAID 278, cycloplegics 133, steroids 92, artificial tears 4 and anti-glaucoma 2.

As per our study, in ophthalmology inpatient department all the 183 prescriptions containing all 871 drugs were prescribed in brand name and none of the drugs were prescribed in generic name. This shows that more the frequency of prescribing the drugs in brand name leads to popularity of brands this may result in misinterpretation of sound alike and look alike drugs.

The most important parameters/essential prerequisites which are mandatory prescription are route of administration, duration of therapy and frequency of administration. All the prescriptions in our study contain all these essential prerequisites. Where 871 drugs were prescribed in ophthalmology inpatients 494(56.71%) drugs were included.

The prescribing pattern observed in the current study was knowledge-based and in accordance with the accepted patterns of treatment of ocular diseases, but the study showed ample scope for improvement in encouraging the ophthalmologists to prescribe by generic name and selection of essential drugs from WHOEML/NEDL/NFI. The study revealed that prescription writing errors were minimum.

LIMITATIONS

- Every hospital has their own drug policy, so it’s difficult to compare with WHO essential list of medicines and its standard guidelines.
- Can’t follow up the patients as our study is only limited for the collection of patient’s data who visits the ophthalmology department for the first time.
- Only 183 patients had taken for this study and the study population is less but higher numbers of patients are required for better results.

- It's only limited to ophthalmology and this type of study should be conducted on another department also.
- The study is done at single center. For better results multi-center study is required.

FUTURE DIRECTIONS

- This type of study can be conducted for longer period for getting a clear understanding about the prescribing pattern of drugs.
- Educational programs to increase the awareness about rationality and for updating knowledge to prescribers can be conducted.
- A pharmacoeconomic study can be done.

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