

*Originalni članci/
Original articles*

ASSESSMENT OF OPHTHALMIC DRUG
PRESCRIBING PATTERN AT JIMMA
UNIVERSITY SPECIALIZED HOSPITAL,
SOUTHWEST ETHIOPIA
PROCENA OFTALMOLOŠKIH LEKOVA
PROPISANIH NA JIMMA UNIVERZITETSKOJ
SPECIJALNOJ BOLNICI, JUGOZAPADNA
ETIOPIJA

Correspondence to:

Fekede Bekele Daba (B.Pharm,
M.Pharm, R.Ph)
School of Pharmacy, Health Institute,
Jimma University, Ethiopia.
P.O.Box: 378
Mobile: +251-935970999
Email: fekedeb@gmail.com;
fekede.bekele@ju.edu.et

Oliyad Dinsa, Fekede Bekele Daba

School of Pharmacy, Health Institute, Jimma University, Ethiopia

Key words

Prescribing, ophthalmic drugs, Jimma
University Specialized Hospital,
Ethiopia

Ključne reči

propisivanje, oftalmološki lekovi,
Specijalna bolnica Jimma Univerziteta,
Etiopija.

Abstract

Background: Irrational prescription of drugs is a common occurrence in clinical practice. Eye disorder can be vision-threatening and must be treated effectively by appropriate and safe use of ophthalmic drugs. The objective of this study was to assess the rationality of prescribing ophthalmic drugs at Jimma University Specialized Hospitals, Southwest Ethiopia.

Methods: A cross-sectional study design involving patient interview was carried out on ophthalmic patients from May to June 2016 using convenient sampling technique. Data were abstracted from the patients and the prescription paper using structured data collection format and interview. Data abstracted included socio-demographics characteristics of patients, prescription information and the type of ophthalmic medications. Descriptive statistics were used to summarize the results.

Results: A total of 196 prescription papers with ophthalmic medications were assessed. The ophthalmic disease was more prevalent in the patients older than 50 years of age 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.

Conclusion: Antibiotics were the most frequently prescribed ophthalmic drugs. Drug dosages, duration of therapy, strength and frequency of administration were incompletely and inadequately written on the prescription. Number of drugs per prescription and generic prescribing were not in line with the WHO recommendation. Prescribers should strictly adhere to the WHO recommendations when to prescribe any of ophthalmic medications especially antibiotics and should prescribe by their generic names in order to avoid irrational drug use in the study area.

INTRODUCTION

Irrational prescription of drugs is a common occurrence in clinical practice⁽¹⁾. Inappropriate, irrational and cost-ineffective uses of pharmaceuticals are worldwide phenomena especially in the developing countries⁽²⁾. More than 50% of all medicines worldwide are prescribed, dispensed, or sold inappropriately. If medicines are not prescribed and used properly, billions of dollars of public and personal funds are

wasted⁽³⁾. Hence, a periodic auditing of drug utilization pattern has become necessary to promote rational prescribing⁽⁴⁾.

Good prescribing practice is prescribing the right drug at the right time, in the right dosage of the right formulation and for the right length of time. It is not always possible to assume that the first drug of choice will be suitable for every patient. Therefore, one has to verify the convenience of the selected drug for that particular patient, including suitability

of the drug, dosage form, dosage schedule and duration of treatment in view of effectiveness and safety^(5,6). Prescriptions orders should always incorporate all necessary information & the prescribing practice of medicines needs to be regularly monitored in order to assess its rationality.

Eye care is one of the most sensitive practices of the health care system. Irrational care of the eye could lead to patient harm ranging from temporary vision loss to blindness⁽⁷⁾, hence eye is a complex organ in which minimal impairment can produce a substantial functional effect.

Recently, there have been many developments and introduction of new ocular therapeutic agents^(8,9). Antibiotics are widely prescribed for various ophthalmic diseases. Evidences have shown trends of resistance to different class of antibiotics often used in ocular therapeutics⁽¹⁰⁾. Eye infections can be vision-threatening and must be treated effectively by appropriate and safe use of topical ophthalmic anti-infective agents⁽¹¹⁻¹²⁾. Topical drugs have clear topical administration advantages and constitute a more convenient way of administration as well as avoiding hepatic first-pass metabolism⁽⁹⁾. But, indiscriminate use of topical antibiotics and non-steroidal anti-inflammatory drugs cause histological and structural change in conjunctiva.

In the current study area, studies on the assessment of ophthalmic prescribing are scarce. Thus, the aim of this study was to assess the rationality of ophthalmic drugs prescribing at Jimma University Specialized Hospital (JUSH), South-west Ethiopia.

METHODS

The study was carried out at ophthalmic clinic of Jimma University Specialized Hospital (JUSH). JUSH, one of few university referral hospitals of Ethiopia, is located in south-west part of the country. A cross-sectional study design involving patient interview was carried out. One hundred ninety six ophthalmic patients who visited the ophthalmology clinic and pharmacy unit from May to June 2016 were included in the study using convenient sampling technique. All prescriptions presented to the dispensary unit with ophthalmic drugs were included. Data were abstracted from the patients and the prescription paper using structured data collection format and this was complemented by interview. Data abstracted included socio-demographics characteristics of patients, prescription information and the type of ophthalmic medications. Descriptive statistics were used to summarize the result.

Prescribing patterns of ophthalmic drugs were measured using WHO prescribing indicators. Accordingly, average number of drugs prescribed per prescription was calculated by dividing the total number of drug products prescribed by the number of prescriptions surveyed. Percentage of drugs prescribed by generic name was calculated by dividing the number of drugs prescribed by generic name by total number of drugs prescribed, multiplied by 100. Percentage of prescriptions in which an antibiotic was prescribed was calculated by dividing the number of prescription in which an antibiotic was prescribed by the total number of prescriptions surveyed, multiplied by 100.

Data collection was conducted after ethical approval of the study was obtained from Ethics Review Committee of School of Pharmacy. Permission was obtained from department of Ophthalmology to undertake the study. Prior to data collection, informed consent was obtained from all patients. Record card number was used as patient identifier and name of the patients was excluded to keep and respect confidentiality of all information obtained.

RESULTS

Sociodemographic characteristic of the patient

A total of 196 ophthalmic patients fulfilling the inclusion criteria were involved in the study. The ophthalmic disease was more prevalent inpatients older than 50 years of age accounting for more than 44%. The prevalence among male and female was almost similar. More than 46% of study participants had no formal education. About 71% were from rural area and 63.3% were living with their family and (Table 1).

Table 1: Socio-demographic characteristics of patients (n=196)

Characteristics		n	(%)
Sex	Male	101	(51.5)
	Female	95	(48.5)
Age (years)	≤10	26	(13.3)
	11-20	19	(9.7)
	21-50	64	(32.7)
	>50	87	(44.4)
Educational status	No formal education	91	(46.4)
	Primary school	60	(30.6)
	High school	28	(14.3)
	College and above	17	(8.7)
Living status	Live with family	124	(63.3)
	Live alone	72	(36.7)
Residence	Rural	139	(70.9)
	Urban	57	(29.1)

Prescribing patterns of ophthalmic drugs

This study shows that, 69.3% of drugs were prescribed by their generic name. Patients with antibiotic prescription were 59.7%. Prescription papers were assessed to check for adequacy of all the necessary information of dosage schedule written by prescribers. Accordingly, doses of the prescribed drugs and duration of therapy were written on 17.8% and 12.8% of prescriptions, respectively [Table 2]. The average number of drugs per prescription was 2.26, ranged between 1 and 5 (Table 3).

Table 2: Analysis of prescriptions of patients with respect to different parameters

Indicators	Frequency	Percent
Average number of drugs per prescription (n=443)	196	2.26±1.01
Percentage of dosage forms recorded (n=196)	179	91.3
Percentage of dose recorded (n=196)	34	17.3
Percentage of strength recorded (n=196)	155	79.1
Percentage of frequency of therapy recorded (n=196)	161	82.1
Percentage of duration of therapy recorded (n=196)	24	12.2
Percentage of drugs prescribed by generic name (n=443)	307	69.3
Percentage of drugs prescribed by Brand name (n=443)	136	30.7
Percentage of prescriptions with antibiotics (n=196)	117	59.7

Table 3: Number of drugs per prescription (n= 196)

Number of drugs per prescription	Number of prescriptions	Percentage
One	54	27.6
Two	82	41.8
Three	29	14.8
Four	17	8.7
Five	14	7.1

In the study population, a total of 443 drugs were prescribed. Out of these, antibiotics were the most commonly prescribed drugs accounting for 59.8% of all the prescribed drugs followed by steroids and analgesics [Table4].

Table 4: Commonly prescribed drug classes (n= 443)

Drug class	Frequency	Percentage
Antibiotics	265	59.8
Steroids	80	18.1
NSAIDs†	55	12.4
Antiviral agents	26	5.9
Others*	17	3.8

†Non-steroidal anti-inflammatory drugs,

*others include antiglaucomal agents, mydriatics, tear substituents

DISCUSSIONS

This study revealed that, ophthalmic disorders are more common in older patients although there was no sex preponderance among the patients. This might indicate that, the eye disease are usually not sex linked but might be age related, as also reported in studies done in Tanzania (13) and India (14). Nearly one half of study participants had no formal education. This might affect the understanding level of patients on important information given by health care professionals and on how to apply the medications to the affected eyes. Most of the study participants were from rural area indicating that they should go long distance to access referral hospital where ophthalmic clinics are available; hence such hospitals are very limited in the area.

Analysis of prescription papers showed that the overall information of dosage schedule written by prescribers was inadequate. The dosage, frequency and duration of drug therapy are the most important parameters and if not clearly recorded can result in irrational use of drugs. In the current study, only 17.3% of prescriptions have recorded dose of the medications. This was comparable with the result from Saudi Arabia which reported only 19.4% of prescriptions have records of dose (15). In contrary, this result was found to be much less compared to the report from a study of India and Dubai which reported more than 89% and 50% of prescriptions were composed of written doses, respectively (14, 16). Duration

of therapy was written on only 12.2% of all prescriptions. Compared to reports from other studies, this finding was found to be very low. Most reports showed that, duration of therapy with ophthalmic medications were absent in very few prescriptions and most of them reported that more than 75% of prescriptions had recorded duration of therapy (14-18). Compared to dosage and duration records, record of frequency of administration is promising. That is, it was written on more

than 82% of prescriptions. In spite of this, this figure is low compared to reports from other studies that, frequency was recorded on more than 89% of prescriptions (14, 17, 18). Prescribers should always remember that the dosage, frequency and duration of drug therapy are the most important parameters and if any of these are not clearly recorded can result in irrational use of drugs that will adversely affect the patient.

Drug prescription forms have a very important point of contact between the health care provider and the user. Prescriber's name and address are important components of prescription paper especially for patient safety. This is indicated where the patient or the dispenser wants to contact the prescriber for any clarification or potential problem with the prescription, and to prevent irrational prescribing by non-prescriber (15,16). The issue of accountability can also be addressed and this information will be important for cross check evaluations in cases of prescription errors and help easily identify the actual prescriber (16). In this study, prescriber's name, qualification and date of prescribing were absent in 91.4%, 91% and 10.8%, respectively. This figure is too large when compared to Saudi Arabia (15), where name was absent in 16.7% of prescriptions. In Dubai and Gondar university hospitals, qualification and date were missing in 9.7% and 10.8% of the prescription, respectively (16, 19). The lack of prescribers' information may be due to lack of awareness of the prescribers on the importance of this information. Ideally, all information on the prescription should be completely written (20). Therefore, a lot has to be done to improve such inadequacy of the practice.

Average number of drugs per prescription is an important index as it tends to measure the degree of polypharmacy (20). In this study, the average number of drugs prescribed per

prescription was 2.26. This result was found to be higher than the figure recommended by WHO. Other research results also reported a low number of drugs per prescription (17, 21, 22). Although such high results were observed in our study, there are still other studies which reported much higher figures. Studies in India reported an average of 2.4 to 5 drugs per prescription (14, 23-28) and (18). Higher figures may lead to increased risk of prescribing errors, drug-drug interactions, and increased hospital admissions due to drug related harms to the patient. Hence, it is advisable to keep the number of drugs per prescription as minimum as possible according to WHO recommendations.

Ideally, all prescription drugs should be prescribed by their generic name. The current study shows that, the percentage of drugs prescribed by generic name was 69.3%. This findings too low compared to the recommendations and one study from Tanzania (99.8%) (14). In the contrary, our finding was higher compared to studies from Ghana, Lebanon and different areas of India which reported 26% - 73% prescriptions by generic name (14, 25, 27, 29). There are also reports in which the prescribers frequently prescribe medications exclusively by their brand names in contrast to WHO recommendation of 100% generic prescription (14, 18, 21, 22). Prescribing drugs by generic name makes the treatment low cost and rational as it avoids errors in prescription writing and confusion of dispensing of different brand names (31).

In this study, out of a total of 443 drugs prescribed, antibiotics were the most common. Accordingly, the average percentage of prescriptions with antibiotics was 59.7%, which is much more than that recommended by WHO. According to WHO, the average percentage of antibiotics per prescriptions should be in the range of 20 to 26.8% (20).

Most literature findings, though better than our study, were not in accordance with the WHO recommendation (17, 18, 22, 27, 32). There are study findings whose antibiotics prescriptions reports are in the range of recommendations (21, 26). The high use of antibiotics may reflect the prevalence of eye infections. At the same time, frequent use of antibiotics is prone to increased risk of emergence of resistant organisms and this in turn can result in ineffectiveness of the available ophthalmic antibiotics. Therefore, health care providers should use antibiotics carefully to patients who will exactly benefit from them.

CONCLUSION

According to this study, the most frequently prescribed ophthalmic drugs were antibiotics and most prescribing parameters including dosage, frequency and duration of therapy are inadequately and incompletely recorded in the prescriptions. The number of drugs per prescription and prescribing by generic names were also not in line with the WHO recommendation. We recommend that prescribers should strictly adhere to the 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.

COMPETING INTERESTS

The authors declare that they have no competing interests.

ACKNOWLEDGEMENTS

This study was supported by Jimma University.

Sažetak

Uvod: neracionalno propisivanje lekova je uobičajena pojava u kliničkoj praksi. Poremećaji oka mogu biti opasni po vid i moraju se efikasno lečiti odgovarajućim i bezbednim oftalmološkim lekovima. Cilj ovog rada je bio da se proceni racionalnost propisivanja oftalmoloških lekova na JIMMA Univerzitetnoj specijalnoj bolnici, Jugozapadna Etiopija.

Metode: Sprovedena je studija preseka koja uključuje razgovor sa oftalmološkim pacijentima od maja do juna 2016. godine koristeći pogodne tehnike uzorkovanja. Podaci su prikupljeni od pacijenata i propisanih recepata koristeći strukturiran upitnik za prikupljanje podataka i intervju. Podaci su uključili socijalno-demografske karakteristike pacijenata, informacije o propisivanju i tip oftalmoloških lekova. Korišćena je deskriptivna statistika da se prikažu rezultati.

Rezultati: Ocenjeni su 196 recepata oftalmoloških lekova. Očne bolesti su češće kod pacijenata starijih od 50 godina, koji čine više od 44%, bez razlike po polu. Prosečan broj lekova po receptu je 2.26, a kretao se između 1 i 5. Samo 69,3% lekova bili su propisani generičkim nazivom. Među ukupno 443 lekova koji su propisani, antibiotici su propisivani najviše, oko 60%. Više od 79% i 82% recepata imali su navedenu jačinu leka i učestalost davanja. Recepata koji su imali navedenu dozu i trajanje terapije bilo je samo 17,8% i 12,8%.

Zaključak: Antibiotici su najčešće propisivani oftalmološki lekovi. Doze leka, trajanje terapije, jačina i učestalost davanja su nepotpuno i neadekvatno napisani na receptima. Broj lekova po receptu i generičko propisivanje nisu bili u skladu sa preporukom SZO. Lekari koji propisuju treba da se strogo pridržavaju preporuka SZO za oftalmološke lekove, a naročito antibiotike i treba da ih propišu generičkim imenima kako bi se izbeglo neracionalno korišćenje.

REFERENCES

1. Ramsay, L.E., 1993. Bridging the gap between clinical pharmacology and rational drug prescribing [see comments]. *British journal of clinical pharmacology*, 35(6), pp.575-576.
2. World Health Organization (WHO), Introduction to Drug Utilization Research. WHO Library Cataloguing-in-Publication Data. Oslo, Norway, 2003. p 6-48.
3. Lancet, T., 2010. Rational use of medicines. *The Lancet*, 375(9731), p.2052.
4. World Health Organization, 2012. The pursuit of responsible use of medicines: sharing and learning from country experiences. Google Scholar.
5. WHO. Promoting rational use of medicines: core components WHO policy perspective on medicine, Geneva, 2002.
6. Food, Medicine and Healthcare Administration and Control Authority (FMHACA) of Ethiopia. 2nd edition. Addis Ababa: Manual for Medicines Good Prescribing Practice; 2012. Available at <http://www.fmhaca.gov.et/Documents/Medicines%20Good%20Prescribing%20Manual%20second%20edition%202012.pdf>.
7. Mandal, R., Maiti, P., Sasmal, N.K., Sinha, N., Gupta, A., Das, K.S. and Biswas, M.C., 2011. Ocular effects of long term use of topical steroids among children and adolescents with vernal keratoconjunctivitis: a prospective observational study. *Journal of the Indian Medical Association*, 109(10), pp.708-10.
8. Leonardi, A., 2005. Emerging drugs for ocular allergy. Expert opinion on emerging drugs, 10(3), pp.505-520.
9. Koevary, S.B., 2003. Pharmacokinetics of topical ocular drug delivery: potential uses for the treatment of diseases of the posterior segment and beyond. *Current drug metabolism*, 4(3), pp.213-222.
10. Asbell, P.A., Colby, K.A., Deng, S., McDonnell, P., Meisler, D.M., Raizman, M.B., Sheppard, J.D. and Sahm, D.F., 2008. Ocular TRUST: nationwide antimicrobial susceptibility patterns in ocular isolates. *American journal of ophthalmology*, 145(6), pp.951-958.
11. Rajasekaran, A., Kumaran, K.S.G.A., Preetha, J.P. and Karthika, K., 2010. A comparative review on conventional and advanced ocular drug delivery formulations. *International Journal of PharmTech Research*, 2(1), pp.668-674.
12. Bremond-Gignac, D., Chiambaretta, F. and Milazzo, S., 2011. A European perspective on topical ophthalmic antibiotics: Current and evolving options. *Ophthalmology and eye diseases*, 3, p.29.
13. Massele, A.Y., Nsimbi, S.E.D. and Rimoy, G., 2001. Prescribing habits in church-owned primary health care facilities in Dar-Es-Salaam and other Tanzanian coast Regions. *East African medical journal*, 78(10), pp.510-514.
14. Ashish Gangwar, Rashmi Singh, Sujata Singh and B.D. Sharma. Pharmacoepidemiology of drugs utilized in ophthalmic outpatient and inpatient department of a tertiary care hospital. *Journal of Applied Pharmaceutical Science*, 01 (09); 2011: 135-140
15. Irshaid, Y.M., Al Homrany, M., Hamdi, A.A., Adjepon Yamoah, K.K. and Mahfouz, A.A., 2005. Compliance with good practice in prescription writing at outpatient clinics in Saudi Arabia. *Eastern Mediterranean Health Journal*. 2005; 11(5/6):922-928
16. Sharif, S.I., Al-Shaqra, M., Hajjar, H., Shamout, A. and Wess, L., 2008. Patterns of drug prescribing in a hospital in Dubai, United Arab Emirates. *Libyan Journal of Medicine*, 3(1), pp.10-12.
17. Meenakshi Nehru, K. Kohli, B. Kapoor, P. Sadhotra*, V. Chopra, R. Sharma. Drug Utilization Study in Outpatient Ophthalmology Department of Government Medical College Jammu. *JK Science*, 7(3); 2005: 149-151
18. Amit Kumar Jain, Seema Jain, Vikrant Sharma, Dadan Ji Pandey, Anand Shukla. Drug utilization study in ophthalmology outpatient department in a tertiary care teaching hospital of western Uttar Pradesh, India. *Asian J Pharm Clin Res*, 9 (1); 2016: 354-356
19. Desta, Z. and Abdulwhab, M., 1996. Prescription writing in Gondar outpatient teaching hospital, Ethiopia. *East African medical journal*, 73(2), pp.115-119.
20. World Health Organization, 1993. How to investigate drug use in health facilities: selected drug use indicators.
21. Chandekar, U. K. & Rataboli, P. V. (2014) A study of drug prescribing pattern using WHO prescribing indicators in the state of Goa, India. *Int J Basic Clin Pharmacol*, 3 (6), 1057-1061.
22. S. B. Dutta, Mirza Atif Beg, Sanjeev Mittal, Manisha Gupta. Prescribing pattern in ophthalmological outpatient department of a tertiary care teaching hospital in Dehradun, Uttarakhand: a pharmaco-epidemiological study. *Int J Basic Clin Pharmacol*. 2014 Jun;3(3):547-552
23. Biswas, N.R., Uppal, R. and Sharma, P.L., 1993. Perinatal prescribing to indoor patients in Nehru Hospital, PGIMER. *Chandigarh J Obset Gynaec India*, 43, pp.907-910.
24. Gupta, N., Sharma, D., Garg, S.K. and Bhargava, V.K., 1997. Auditing of prescriptions to study utilization of antimicrobials in a tertiary hospital. *Indian journal of pharmacology*, 29(6), p.411.
25. Kanchan Kumar Mondal, Supreeti Biswas, Rajat Kanti Biswas, Anjan Adhikari, Biswajit Sukul, Saibendu Kumar Lahiri, Krishnangshu Ray. A Study of rational use of Drugs among the Ophthalmic-in-Patients of a Government Teaching Hospital In view of Forensic Pharmacology. *J Indian Acad Forensic Med*. 2011; 33(4)
26. Nihar R. Biswas, Rajat S. Biswas, Prem S. Pal, Sunil K. Jain, Satya P. Malhotra, Ashok Gupta And Shanthi N. Pal. Patterns of prescriptions and drug use in two tertiary hospitals in delhi. *Indian J Physiol Pharmacol*. 2000; 44 (1): 109-112
27. Sunil Karande, Punam Sankhe and Madhuri Kulkarni. Patterns of Prescription and Drug Dispensing. *Indian Journal of Pediatrics*, 2005; Volume 72
28. Suman RK, Gore VS, Mohanty IR et al. prescribing patterns of drugs used for treatment of conjunctivitis in ophthalmology outpatient department of tertiary care hospital. *Int J Health Sci Res*. 2015; 5(3):194-199.
29. Bosu, W.K. and Ofori-Adjei, D., 1999. An audit of prescribing practices in health care facilities of the Wassa West district of Ghana. *West African journal of medicine*, 19(4), pp.298-303.
30. Hamadeh, G.N., Dickerson, L.M., Saab, B.R. and Major, S.C., 2001. Common prescriptions in ambulatory care in Lebanon. *Annals of pharmacotherapy*, 35(5), pp.636-640.
31. Sharma, D., Reeta, K.H., Badyal, D.K., Garg, S.K. and Bhargava, V.K., 1998. Antimicrobial prescribing pattern in an Indian tertiary hospital. *Indian journal of physiology and pharmacology*, 42(4), pp.533-537.
32. Desta, Z., Abula, T., Gebre-Yohannes, A. and Worku, A., 2002. Drug prescribing patterns for outpatients in three hospitals in north-west Ethiopia. *Ethiopian Journal of Health Development*, 16(2), pp.183-189.