



The Outpatient Use of Furosemide in a Public Hospital

Nehad J. Ahmed^{1*}

¹*Department of Clinical Pharmacy, Prince Sattam Bin Abdulaziz University, Al-Kharj, Saudi Arabia.*

Author's contribution

The sole author designed, analysed, interpreted and prepared the manuscript.

Article Information

DOI: 10.9734/JPRI/2020/v32i730463

Editor(s):

(1) Rahul S. Khupse, University of Findlay, USA.

Reviewers:

(1) Hussin Jose Hejase, Al Maaref University, Lebanon.

(2) Syed Umer Jan, University of Balochistan, Pakistan.

(3) Yuji Aoki, Matsumoto University, Japan.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/56052>

Received 08 February 2020

Accepted 12 April 2020

Published 24 May 2020

Original Research Article

ABSTRACT

Aim: The prescribing pattern of furosemide helps the prescribers in the monitoring and evaluation of the drugs and helps them in recommending the necessary modifications. So the aim of the present study is to demonstrate the outpatient use of furosemide in a public hospital.

Methodology: This is a retrospective study was conducted in a public hospital in Alkharj city. The outpatient prescriptions were reviewed to demonstrate the prescription patterns of furosemide. The study included all outpatient prescriptions that contains furosemide in 2018.

Results: Furosemide was prescribed in 46.27% of diuretics prescriptions in the outpatient setting. The majority of the patients were female patients. Most of the patients were more than 39 years old. Most of the furosemide prescriptions were prescribed mainly by resident prescribers, mainly in the cardiology department.

Conclusion: Furosemide is an important medication for treating cardiovascular diseases specially in the presence of edema. It is important to increase the awareness of health care professionals and patients regarding the use of furosemide. Moreover, it is important to increase the awareness of the public regarding the importance of adherence to furosemide.

Keywords: *Outpatient; use; prescribing; furosemide.*

*Corresponding author: E-mail: pharmdnehadjaser@yahoo.com, n.ahmed@psau.edu.sa;

1. INTRODUCTION

The main goal of medication therapy is to improve the quality of life of the patients. Medication plays an important role in drug therapy. The medicine should be used correctly by giving the right drug for the right patient at the right dose and duration as per clinical need [1]. Drug and therapeutics committees can considerably improve drug usage and decrease costs for health care services. Unsuitable usage of drug wastes resources and decreases the quality of patient's care [2]. The needed medications should be efficacious, affordable and safe. One of the good ways to improve health status is the rational usage of essential medication [3].

The prescription can be defined as a legal document containing directions for medication and is written by a licensed practitioner to the pharmacist [4]. Many organizations give a manual on prescribing guidance such as World Health Organization, British National Formulary and Medical Council ethical codes of Nepal [5-7]. Unfortunately, a previous study showed that most of doctors don't adhere to these guidelines. It is important to prescribe medications correctly because the correct prescribing affects the drug therapy as well as patient's health [8,9].

Cardiovascular diseases (CVDs) are common diseases that affect the heart and the circulatory system and include many diseases such as congestive heart failure, ischemic heart disease, hypertension, peripheral artery diseases and stroke. There are many modifiable and non-modifiable risk factors of CVDs, important modifiable risk factors include the unhealthy diet, tobacco use, physical sedentariness, obesity and abnormal blood lipid profile [10]. In the world today about 30% of deaths are caused due to CVDs, among these deaths approximately 40% are occurred in high-income countries and around 28% occurred in middle and low-income countries. The global rise in CVD is the result of industrialization, urbanization and concomitant lifestyle alterations [11].

Several classes of medicines are available for the management of CVDs. Commonly used drugs to treat CVDs are calcium channel blockers, beta blockers, vasodilators, angiotensin-converting enzyme inhibitors, angiotensin receptor blockers, diuretics, antiplatelet and lipid-lowering agents [12]. Furosemide is one of the cardiovascular drugs

that is used to treat fluid retention in people with liver diseases, congestive heart failure or kidney diseases such as nephrotic syndrome [13].

The prescribing pattern help the prescribers in the monitoring and evaluation of the drugs and help them in recommending the necessary modifications [14]. Numerous factors related to the inappropriate prescribing which include unsafe and ineffective treatment, prolongation of illness, in addition to distress and excessive economic burden to the patient [15,16]. So the aim of the present study is to demonstrate the outpatient use of furosemide in a public hospital in order to help the prescribers in evaluating the drug therapy and to recommend the needed modifications.

2. METHODOLOGY

This is a retrospective study conducted in a public hospital in Alkharj city. The prescriptions in the outpatient setting were reviewed to demonstrate the prescription patterns of furosemide. The inclusion criteria include all outpatient prescriptions that contains furosemide in 2018. Therefore, the prescriptions in inpatient setting, the prescriptions before or after 2018 and the prescriptions that don't contain furosemide were excluded.

After the collection of the data, data analysis is conducted using Excel software. Furthermore, according to Hejase and Hejase [17], "descriptive statistics deals with describing a collection of data by condensing the amounts of data into simple representative numerical quantities or plots that can provide a better understanding of the collected data." Therefore, this study analyzed data collected with descriptive statistics such as frequencies and percentages supported with data tables for clarity.

This study was approved by the Institutional Review Board of the ministry of health with a log number of 2019-0153E.

3. RESULTS

Furosemide was prescribed by 180 prescriptions in the outpatient setting in 2018 out of 389 diuretics prescriptions (46.27%). Other diuretics were prescribed less commonly, for example hydrochlorothiazide was prescribed in 56 prescriptions only (31.11%). The majority of the patients were female patients (53.33%). Table 1 shows patients' personal data.

Table 1. Personal data

Variable	Category	Number	Percentage
Gender	Male	84	46.67
	Female	96	53.33
Nationality	Saudi	143	79.44
	Non-Saudi	37	20.56

Most of the patients were in the ages between 50-69 (52.21%) as shown in Table 2.

Table 2. Age of the patients

Age	Number	Percentage
Less than 20	2	1.11
20-29	4	2.22
30-39	3	1.66
40-49	22	12.22
50-59	46	25.56
60-69	48	26.67
70-79	35	19.44
More than 80	20	11.11

Furosemide was prescribed mainly by resident prescribers (68.33%). Table 3 shows the prescribers' level.

Table 3. The level of the prescribers

Variable	Number	Percentage
Consultant	28	15.56
Resident	123	68.33
Specialist	29	16.11

Furosemide was prescribed mainly from cardiology department (49.44%). Table 4 shows the departments that prescribed furosemide for patients in the outpatient setting.

Table 4. The departments that prescribed furosemide for patients in the outpatient setting

Department	Number	Percentage
Cardiology	89	49.44
Emergency	32	17.78
Gastroenterology	6	3.33
Internal Medicine	40	22.22
Nephrology	11	6.11
Neurology	2	1.11

The majority of the patients didn't refill furosemide prescription (85.81%). Table 5 shows the frequency of prescribing furosemide.

4. DISCUSSION

Furosemide was prescribed in 46.27% of diuretics prescriptions in the outpatient setting in 2018. In contrast of our study, Rimoy et al. [18] reported that bendrofluazide was the most prescribed diuretics in the outpatient setting. Similar to our study, Furosemide was the most prescribed diuretics as reported by Thapa and Singh [19] and by Shalavadi et al. [20].

53.33% of the patients were female patients. The grand majority of the patients were more than 39 years old (95.01%). This is rational because the patients who use furosemide have fluid retention specially, patient with liver diseases, congestive heart failure or kidney diseases. These diseases are more common in advancing ages. Shalavadi et al reported that for general antihypertensive medication prescription, most of the patients who receive antihypertensive drugs were in the ages of 40 or more than 40 (19.33%) [20].

In the present study furosemide was prescribed mainly by resident prescribers (68.33%). Usually residents have insufficient experience so they should prescribe furosemide under the supervision of more experienced specialists and consultants.

Furosemide is a cardiovascular drug so it is rational to be mostly prescribed by the departments that have patients with cardiovascular diseases such as cardiology, internal medicine and emergency departments. Similarly, in our study, furosemide was prescribed mainly by cardiology department

Table 5. The frequency of prescribing furosemide

Variable	Number	Percentage
Patients who didn't refill Furosemide prescription	133	85.81
Patients who refill Furosemide prescription once	20	12.90
Patients who refill Furosemide prescription twice	1	0.64
Patients who refill Furosemide prescription three times	1	0.64

(49.44 %) followed by internal medicine (22.22%) and emergency department (17.77%).

85.81% of the patients didn't refill furosemide prescription which demonstrates a low adherence rate for the patients. In contrast to our study, Viana et al. [21] reported that the adherence rate was 96.0% for loop diuretics but in his study he focuses only on chronic heart failure patients [21]. Moreover, Hincapie et al. [22] reported that regarding all medications non-adherence, about 48.3% of the participants reported never obtaining, obtaining but not using, or starting but stopping prescribed medications in general. He also reported that regarding furosemide, some patients did not obtain and some patients started its using but stopped it.

5. CONCLUSION

Furosemide is an important medication for treating cardiovascular diseases specially in the presence of edema and usually prescribed in the advanced age. It is prescribed mainly by residents. It is important to increase the awareness of health care professionals and patients regarding the use of furosemide. Moreover, the study shows low adherence rate of furosemide so it is important to increase the awareness of the public regarding the importance of adherence to furosemide in order to improve the patients' health status and their quality of life.

DISCLAIMER

The products used for this research are commonly and predominantly used products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

CONSENT

As per international standard or university standard written patient consent has been collected and preserved by the author.

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author.

ACKNOWLEDGEMENT

This Publication was supported by the Deanship of Scientific Research at Prince Sattam bin Abdulaziz University.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. WHO. Promoting rational use of medicine: core components; 2002. Available:<http://apps.who.int/medicinedocs/pdf/h3011e/h3011e.pdf> [Cited on, 2018]
2. Organization WH. Drug and therapeutics committees: A practical guide. Geneva: World Health Organization; 2003.
3. Desalegn AA. Assessment of drug use pattern using WHO prescribing indicators at Hawassa University teaching and referral hospital, South Ethiopia: A cross-sectional study. BMC Health Serv Res. 2013;13(1):170.
4. Ather A, Neelkantreddy P, Anand G, Manjunath G, Vishwanath J, Riyaz M. A study on determination of prescription writing errors in outpatient Department of Medicine in a Teaching Hospital. Indian J. Pharm. Pract. 2013;6(2):21–24.
5. Association BM. Britain RPSoG. In: British national formulary 73; 2017.
6. De Vries T, Henning R, Hogerzeil HV, Fresle D, Policy M, Organization WH. Guide to good prescribing: A practical manual; 1994.
7. Code of ethics and professional conducts; 2017. [Cited on 2017] Available:<http://www.nmc.org.np/assets/uploads/files/Code-of-Ethics-2017.pdf>
8. Jain S, Upadhyaya P, Goyal J, Kumar A, Jain P, Seth V, et al. A systematic review of prescription pattern monitoring studies and their effectiveness in promoting rational use of medicines. Perspect Clin Res. 2015;6(2):86.
9. Mortazavi SA, Hajebi G. An investigation on the nature and extent of occurrence of errors of commission in hospital prescriptions. Iran J Pharm Res. 2010; 83–7.
10. Muhit MA, Rahman MO, Raihan SZ. Cardiovascular disease prevalence and

- prescription patterns at a tertiary level hospital in Bangladesh. *J. Appl. Pharm. Sci.* 2012;2:80-4.
11. Gaziano TA, Gaziano JM. Epidemiology of Cardiovascular Disease. In: Lango DL (ed.). *Harrison's Principles of Internal Medicine*. 18th edn. New York, McGraw Hill. 2012;1811-6.
 12. Rathod PS, Patil PT, Lohar RP. Prescription pattern in indoor patients of cardiovascular diseases: A descriptive study in a tertiary care hospital attached to a government medical college. *Int J Basic Clin Pharmacol.* 2016;5:491-5.
 13. Drugs.com. Furosemide (Lasix) Uses, Dosage, Side Effects - Drugs.Com; 2020. Available:<<https://www.drugs.com/furosemide.html>> [Accessed, 18 March 2020]
 14. Srishyla MV, Krishnamurthy M. Prescription audit in an Indian Hospital setting using the DDD concept. *Ind J Pharmacol.* 1994;26:23-8.
 15. Ramsay LE. Bridging the gap between clinical pharmacology and rational drug prescribing. *Br J Clin Pharmacol.* 1993;35: 575-6.
 16. Vries MD, Heluling RH. *Guide to good prescribing*. A practical guide WHO; 1994.
 17. Hejase AJ, Hejase HJ. *Research methods: A practical approach for business students* (2nd edition). Philadelphia, PA, USA: Masadir Inc. 2013;272.
 18. Rimoy GH, Justin-Temu M, Nilay C. Prescribing patterns and cost of antihypertensive drugs in private hospitals in Dar es Salaam, Tanzania. *East Cent Afr J Pharm Sci.* 2008;11:67-73.
 19. Thapa R, Singh S. A study on medicine utilization pattern in outpatient Departments of Tertiary Care Centre In Kathmandu. *Nepal Med Coll J.* 2019;21 (4):319-26.
 20. Shalavadi M, Chandrashekhar V, Manohar K, Nihar K, Srikanth DRS. A prospective study on prescription pattern of antihypertensive drugs and drug interactions at a tertiary care teaching hospital. *Am J Pharmacol.* 2018;1(2): 1010.
 21. Viana M, Laszczynska O, Mendes S, Friões F, Lourenço P, Bettencourt P, et al. Medication adherence to specific drug classes in chronic heart failure. *J Manag Care Spec Pharm.* 2014;20(10): 1018-26.
 22. Hincapie AL, Taylor AM, Boesen KP, Warholak T. Understanding reasons for nonadherence to medications in a medicare part D beneficiary sample. *J Manag Care Spec Pharm.* 2015;21(5): 391-9.

© 2020 Ahmed; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:

The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/56052>