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Prescription Pattern of Injection at Out Patient Pharmacy Department of Adama Hospital Medical College, Adama, Ethiopia

Belayneh Kefal Gelaw[1]*, Adunya Feyissa[1], Gobezie Temasgen Tegegne[1], Getasew Amogne Ayinalem[2] and Amsalu Degu Defersha[1]

[1]Department of Pharmacy, College of Medicine and Health Sciences, Ambo University, P.O.Box: 19, Ambo, Ethiopia
[2]Department of Pharmacy, College of Medicine and Health Sciences, Wollo University, P.O.Box: 1145, Dessie, Ethiopia

Abstract

Introduction: Injection is an infusion method of putting drugs or fluids in to the body with a hollow needle and a syringe. The use of injection for treatment accompanied with variety of disadvantages including sepsis at administration, risk of tissue toxicity, costly difficulties in correcting the error. Injections are very expensive compared to other dosage forms and require trained personnel for administration. Moreover, unhygienic use of injections can increase the risk of transmission of potentially serious pathogens, such as hepatitis, HIV/AIDS, and blood-borne diseases. It is estimated by the WHO that about 16 billion injections are undertaken in developing countries annually and are often irrationally used.

Objective: The present study was aimed to assess the prescription pattern of injections in Adama Hospital Medical College.

Method: Hospital based Prospective cross sectional study was done to assess prescription pattern of injections in outpatient pharmacy of AHMC. All Prescription cards from March 24, 2015 to May 24, 2015 were taken and reviewed using pre-tested data collection format. Finally data was edited, coded, tallied and cleaned. Descriptive statistics was computed.

Result: On review of 500 prescription papers, 600 injections were prescribed. The percentage of prescriptions containing name of the patient, sex, age, address, date and card number were 490 (98%), 395 (79%), 405 (81%), 250 (50%), 300 (60%) and 480 (96%) respectively. The most commonly prescribed therapeutic class was inject able antibiotics 154 (25%), anti pains 120 (20%) and diuretics 66 (11%). Injections prescribed with over, under and optimum dose were 15 (2.5%), 9 (1.5%), 576(96%), respectively. About 18 (3%), 6 (1%) and 2 (0.3%) of antibiotics were prescribed by incorrect frequency, short and extended duration of administration, respectively. Only on 190 (38%), 65 (13%) and 480 (96%) of prescription papers were names, qualification and signature of the prescribers specified respectively.

Conclusion: There was rational use of injections in the hospital though there are some problems that have to be considered.

Keywords: Injection medicine; Prescribing pattern; Prescribers; Prescription; Adama

Abbreviations

AHMC: Adama Hospital Medical College; ARVT: Anti Retro viral Therapy Pharmacy; EDL: Essential Drug List; EP: Emergency Pharmacy; ID: Inject able Drugs; IP: Inpatient Pharmacy; OP: Outpatient Pharmacy; OPD: Out Patient Department; WHO: World Health Organization

Introduction

Background

Injection is an infusion method of administering drugs or fluids into the body with a hollow needle and a syringe. The uses of injectable drugs have many disadvantages including sepsis at administration, risk of tissue toxicity, costly difficulties in correcting the error. Injections are very expensive compared to other dosage forms and require skilled personnel for administration. Apart from this, unhygienic use of injections can enhance the hazard of transmission of potentially serious pathogens, such as hepatitis, HIV/AIDS, and blood-borne diseases [1]. According to WHO report about 16 billion injections are undertaken in developing countries annually [2].

Injectable drugs are often irrationally used. Use of Drugs involves the prescribing, dispensing and the interaction between the prescriber and the patient. These behaviors include the process of making a diagnosis, prescribing, dispensing, and use of drugs by the patient [3,4].

According to World Health Organization (WHO) definition the rational use of injectable drugs requires that patient receive the right medications at the right dose, right frequency and duration of therapy and in the lowest cost that could be afford by them and their community. Rational use of drugs is also one indispensible element in achieving quality of health and medical care for patients and the community as a whole [5].

According to a study done in the northern, central, eastern, western and southern areas of Tehran in 1999, the average prescription injectable drugs for each encounter was equivalent to 3.6 which 39% of it consisted of injection medicines [6]. Another study conducted in Tehran revealed that the average prescribed items were equivalent to 2.85 and at least one injection item was among 28.96% of them [7].

Rational prescription could be achieved if the prescribers have

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access to an essential drugs list and the essential drugs are available on a regular basis. In the absence of such facility-related factors, the risk of irrational prescribing could raise several folds. Irrational use of drugs is presently a major health problem in medical practice whose consequences include ineffective treatment, unnecessary prescription of drugs particularly antimicrobials and injections, development of resistance to antibiotics, adverse effects and economic burden on both patients and society. It has been estimated that 50% or more expenditure on medicines is being wasted through irrational prescribing, dispensing and usage [8,9].

Statement of the problem

Globally, it is anticipated that more than 30% of injections prescribed, dispensed or sold improperly. Irrational use of injection has been found to be a frequent problem in various parts of the world, especially in developing countries. Irrational prescription of injection medicines is also one of the common problems of medical treatments in developing countries [2]. Nonetheless, overuse of injection medicines is an additional current health problem in developing countries, On top of this, the practice of irrational prescribing is a global major problem of health care delivery. However, this problem is most commonly pronounced in developing countries where health budgets are small and 30-40 % of the total health budget is spent on drugs [9].

Prescription of injectable drugs carries all necessary information, such as name, age, and address of the patient together with a brief diagnosis of the condition targeted by the drug treatment. However, most prescription did not contain this information [9]

Significance of the study

1. Most prescription of injectable drugs do not full fill the requirement information on the prescription paper such as patient related information, drug related information and prescriber related information. The finding of this study would enable to improve such problems and to fill the gap that observed on the prescription pattern of inject able drugs.

2. The data regarding pattern of injection use in the AHMC is still lacking or scarce. This study is thus initiated to fill such information gaps by determining the pattern of injection use in the hospital.

3. This study will also provide a base line data for policy makers and also initiate other researchers on this topic.

Objective

General objective: To assess prescription pattern of injectable drugs in AHMC

Specific objective

1. To assess the percentage of injectable drugs per prescription

2. To determine the percentage of injections prescribed by generic name per encounter

3. To determine the type of drugs commonly prescribed.

Methods and Materials

Study area

Adama Hospital Medical College is located in the Middle East Ethiopia, Oromia Regional state, in Adama town 99km from Addis Ababa to the South East. It was established in 1946 by Italian missionaries. The hospital was named as Hailemariam Mamo memorial

hospital little bit after establishment, but its name was changed to Adama Referral Hospital in mean time and now it renamed as Adama Hospital Medical College by Oromia regional state health bureau after it start to teach accelerated medicine, Emergency surgery and some Specialty in 2011.AHMC is one of the hospital that serve large size of population from middle east and southern Oromia, Afar, Somali, Southern Nation, Nationalities and peoples(SNNP) and even some parts of Amhara region. Currently the college hospital has catchment population of about 5 million serving as referral hospital for all nearby hospitals and the adjacent regions. It has capacity of 200 beds for inpatient with five disciplines (Surgery, Internal medicine, pediatrics, Gynecology/Obstetrics and ophthalmology) with four pharmacies (OPD, ward, emergency and ART pharmacy) and serves about 850 patients per day at OPD during working hours and on average 52 patients per day after working time in private wing clinic. The hospital has about 465 workers of which 257 were health professionals and the remaining are administrative workers and teachers. The hospital is now working in collaboration with Adama General Hospital and Medical College (AGHMC)

Study period

Study was conducted from March 24, 2015 to May 24, 2015.

Study design

A prospective cross sectional study was done to assess prescription pattern.

Source population and study population

Source population

All available prescription in the outpatient Pharmacy department during the study period

Study population

All prescription containing injectable drugs during the study period

Inclusion and exclusion criteria

Inclusion criteria: All prescription containing injectable drugs

Exclusion criteria Those prescriptions containing drugs which were not clear to read Prescriptions from other health settings dispensed in the hospital. Prescriptions containing only medical supplies such as syringe, needle and catheter

Sampling size

A total of 500 encounters containing injectable drugs were successfully evaluated during the study period.

Measurements

Dependent variables

Number of injectable drugs per prescription

Number of injectable drugs prescribed by generic name

Prescription pattern of injectable drugs

Independent variables: Socio demographic characteristics

Data collection process

The data was collected by four trained data collectors (pharmacy Graduating class students) using pretested data collection formats.

Data was collected from the prescription paper. The collected data was checked for completeness and consistency before processing.

Data quality control

The quality and completeness of the data was checked by the principal investigator. Pretest was performed as a part of training and the data collectors were guided by the investigators.

Data processing and data analyzing

Data were complied, analyzed and summarized then interpreted by using tables or graphs. The collected data were carefully analyzed by using calculator manually.

Ethical approval

Ethical clearance was obtained from Ethical Review Board of College of Medicine and Health Sciences of Ambo University to conduct this study.

Operational Definitions

Prescriber: Any medical practitioner who is authorized/licensed to write prescription.

Injectable drugs: Are drugs which were administered parenteral route.

Prescription: Is a written form of communication between any authorized body and pharmacists to dispense drugs.

Poly pharmacy: Is when the prescription contains three or more drugs at once.

Injection: Is an infusion method of putting drugs or fluids in to the body with a hollow needle and a syringe.

Results

Patient related information

During the study period five hundred (500) encounters were successfully evaluated. The percentage of prescriptions containing name of the patient, sex, age, address, date and card number were 490 (98%), 395 (79%), 405 (81%), 250 (50%), 300 (60%) and 480 (96%) respectively (Figure 1).

Prescriber related information

Only on 190 (38%), 65 (13%) and 480 (96%) of prescription papers were names, qualification and signature of the prescribers specified respectively (Table 1).

Drug related information

Six hundred (600) injectable drugs were prescribed during the study period and the most commonly prescribed therapeutic class was injectable antibiotics 154 (25%), anti pains 120 (20%) and diuretics 66 (11%) respectively (Table 2)

Among the individual prescribed injections ceftriaxone (10.4%) and diclofenac (8.8%) were highly prescribed (Table 3).

Regarding the number of drugs per encounter 25%, 50%, 15% and 10% of the prescription were prescribed with one, two, three and four drugs respectively (Figure 2).

Discussions

In appropriate prescription of injectable drugs might reduce the quality of medical care, patient safety, and leads to wastage of resources. An encounter provides an insight into a prescriber's attitude to the diseases being treated and the nature of health care delivery system in the community.

According to this study, 490 (98%) prescription papers contain name of patients. This was comparable when compared with a study conducted in Nigeria for which 99.86% of the prescriptions contained patients name [10]. Even if the figure is low 10 (2%), it might have created problem during dispensing of the right drug to the right patient, and wrong drug might have been given to wrong patient (Table 4).

In this study, about 105 (21%), 95 (19%), 250 (50%), 200 (40%) and 20 (4%) prescriptions did not contain patients sex, age, address, date and card number respectively (Table 5). When compared with study done in Health facilities in North Ethiopia, prescriptions which did not contain any information on patient address (6.02%), age (2%), and sex (4.03%) were higher in this study. But figures for sex, age and address were lower in this study when compared with another study in hospital pharmacy in Saudi Arabia and France which showed prescriptions that did not contained age, and sex were 22.7 and 49.7%, and no prescription contained patient address [4 ,11]. Regarding to prescriber related information, only 38%, 13% and 96% of the prescription papers were names, qualification and signature of the prescribers specified respectively.

About 310 (62%) prescriptions did not contain name and 435 (87%) did not specify the qualification of prescribers, but all most all prescriptions (96%) were signed. This was different from a study done in hospital pharmacy in Saudi Arabia where 83.3%, 9.6% and 81.9% of the prescriptions contained name, qualification and signature for the prescribers, respectively and in France where full name and signature was written only for 7.8% of prescriptions [4, 11]. Of a total of 600
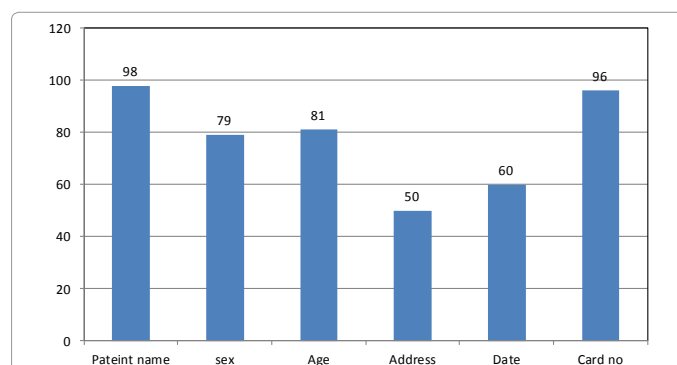

Figure1: Patient related information on the prescription in AHMC from March 20 - May 20, 2007.
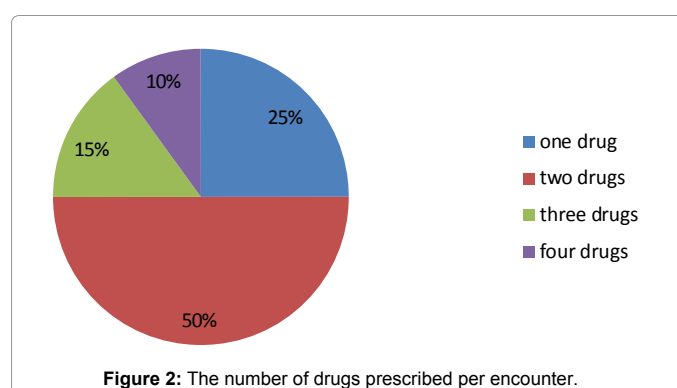

Figure 2: The number of drugs prescribed per encounter.

Prescriber related information	Frequency	Percentage (%)
Name of the prescriber	190	38 %
Qualification	65	13 %
Signature	480	96 %

Table1: Prescriber related information on the prescription in AHMC from March 20 to May 20, 2007.

S.NO	Class of injectable drugs	Frequency	Percentage (%)
1	Anti biotic	154	25 %
2	Anti pain	120	20 %
3	Diuretics	66	11 %
4	Corticosteroid	54	9 %
5	Respiratory drugs	54	9 %
6	Vitamins	42	7 %
7	GIT	36	96%
8	Cardiovascular	36	6 %
9	CNS	24	4 %
10	Others	14	2.3 %
Total		600	100 %

Table 2: Drug related information on the prescription in AHMC from March 20-May20, 2007.

Prescribed injection	Frequency	Percentage (%)
Cefriaxone	52	10.4 %
Diclofenac	44	8.8 %
Insulin	40	8 %
Metronidazole	41	8.2 %
Gentamicin	38	7.6 %
Ampicilin	34	6.8 %
Cloxacilin	28	5.6 %
Furosemide	26	5.2 %
Penicillin G Benzanthin	20	4 %
Vitamin B complex	18	3.6 %
Total	341	68.2 %

Table 3: The top ten prescribed injections at the outpatient pharmacy of AHMC from March 20- May20, 2007

prescribed drug products, the most commonly prescribed drugs were antibiotics (25.7%), ant pains (20%) and diuretics (11%) (Table2).

The percentage of drugs prescribed by generic names at AHMC was 96% which approaches the Standard value set by WHO (100%) and higher than the national value reported by Federal Democratic Republic of Ethiopia Ministry of Health (FDREMOH) in 2003(87%). However, lesser value was reported in India (48.5%) [12].This might be because of prescribers well trained, experienced, and qualified.

In this study, from a total of 600 injectable drugs prescribed, the average number of drugs per encounter was 1.2; this is lower when compared with the standard (1.6-1.8) The value from this study is also much lower as compared with the study conducted in Hawassa University Hospital, which was 1.9 [1].This might be so due to prescribers qualification and experience. Essential drugs offer a cost-effective solution to many health problems in developing countries. The national EDL were selected regarding to disease frequency, affordability, with assured quality and availability in appropriate dosage forms. Regarding the percentage of drugs prescribed in AHMC from the essential drug list was 94.7%, which is less than the ideal value of 100% set by WHO, and other studies results reported by Desalegn in 2013 from Hawassa university hospital (96.6%) [1] and Federal Democratic Republic of Ethiopia Ministry of Health (FMOH) national report in 2003 (99%). This may be due to lack of awareness of Essential Drug List and deficiency of availability of Essential Drug List.

In this study about 582(97%) of drugs were prescribed with its frequency and about 18(3%) were not prescribed with its frequency. This is comparable with study conducted in Iran for which 96.5% and 17.3% of the drugs were prescribed with correct and incorrect frequency, respectively. The present study raveled that analgesics were the second most commonly prescribed drugs group in this health facility. This may be so due to patients demand and the primary instinct of pain alleviation by prescribers. However, higher values of 64.3 and 41 % have been reported from other studies in Nigeria [13,14]. Vitamins were prescribed in 7 % of encounters in this study. This figures is much lower than those found in the India study where 62.9 % of prescriptions had vitamins prescribed [13]. This may be so due to patients' low demand of vitamins.

Class of drug	Dose			Strength	Frequency		Duration of treatment		
	Over	Under	Optimum	Correct	Yes	No	Long	Short	Optimum
Anti pain	-	-	120	120	118	2	-	-	120
Corticosteroid	1	3	50	54	54	-	-	1	53
Vitamins	-	-	42	42	40	2	-	3	39
GIT	-	-	36	36	36	-	-	-	36
Antibiotics	10	4	14o	154	144	10	2	2	150
Diuretics	-	-	66	66	66	-	-	-	66
Respir. Drugs	3	1	50	54	54	-	-	-	54
CVS	-	1	35	36	36	-	-	-	36
CNS	-	1	23	24	22	2	-	-	24
Others	-	-	14	14	12	2	-	-	14
Total	15(2.5)	9(1.5)	576(96)	600(100)	582(97)	18(3)	2(0.3)	6(1)	592(98.7)

Table 4: Class of injectable drugs prescribed in AHMC from March 20 to May 20, 2007.

Class of drugs	Prescribed by generic name	Written in short (abbreviation)	Written for proper diagnosis
Anti pain	120	-	-
Corticosteroids	54	-	-
Vitamins	42	-	-
GIT	36	-	-
Antibiotics	134	20	-
Diuretics	62	-	-
Respiratory drugs	54	-	-
CVS	36	-	-
CNS	24	-	-
Others	10	4	-
Total	572(96)	24(4)	-

Table 5: List of drugs prescribed.

In this study all drugs (100%) were prescribed in correct strength. This was different from the study conducted in Nigeria where 84% of drugs were prescribed by correct strength. This difference is might be due to prescribers experience toward writing the correct strength of drugs [14].

From a total of prescribed drugs about 15(2.5%) and 9(1.5%) were prescribed as over and under dose. This is was different from study done Iran hospital for which over and under dose was 5.01% and 8.5%, respectively. This may be because of variation in prescribers' knowledge and experience on drug dose [15].

Conclusion

Most of the injectable drugs were prescribed in their generic name even if a few of them were prescribed in brand form. The percentage of injectable antibiotics prescribed was high which could contribute for drug resistance and all of the prescriptions found with no diagnosis. Some prescriptions missed relevant information especially with regard to patient and prescriber related information. Based on the findings of this study, the prescribing practice for injection exhibited deviation from the standard recommended by WHO and prescribing in generic name were found to be a problem in this study.

Recommendation

Based on the result the following recommendations were forwarded.

Prescribers: All of the drugs should be prescribed in their generic name and it is better if the diagnosis is written on the prescription because it helps for the pharmacists to ensure that the drugs prescribed are appropriate for the patient condition.

Ministry of health: There is a clear need for medical education programs which could rationalize the prescribing of injection and the prescribers should clearly complete information on the prescriptions.

Pharmacy staff: The pharmacy staff should provide the relevant information to the prescribers about effective utilization of drugs by establishing Drug Information Center (DIC). Identifying and correcting health care is the common duty of all health professionals and inter disciplinary communication should be improved among them.

To concerned body: Further research could be conducted on the topic with wide sample size and analytical statistics

Authors' Contribution

BKG; carried out the research drafting, design, statistical analysis and interpretation as well as coordinating all activities in the research, AF; participate in the sequence alignment and drafted a manuscript, GTT; participates in the design of the study and performs statistical analysis, ADD; participate in the design, analysis and interpretation of the research, JLL; participated in literature review, identified the research design issues, participated in coordination, and reviewed the manuscript.

Competing Interest

Non declared

Acknowledgement

References

1. Desalegn AA1 (2013) Assessment of drug use pattern using WHO prescribing indicators at Hawassa University Teaching and Referral Hospital, south Ethiopia: a cross-sectional study. See comment in PubMed Commons below BMC Health Serv Res 13: 170.

2. http/www.wise geek.com what are injection drugs.htm. Accessed date July13-201

3. Pattern of drug prescription Dubai hospital, United Arab Emirates accessed date June12, 2011

4. François P1, Chirpaz E, Bontemps H, Labarère J, Bosson JL, et al. (1997) Evaluation of prescription-writing quality in a French university hospital. See comment in PubMed Commons below Clin Perform Qual Health Care 5: 111-115.

5. Guide lines for implementing drug utilization review programs in hospitals. Accessed date July7, 2011.

6. Hakim, Nikzad A (2004) Status of prescription and drug usage in Tehran. J prev med public health 45: 1-8.

7. Mosleh A, Darbooy S, Ansari KS, Mohammadi M (2008) Drug prescription based on WHO indicators: Tehran University of medical sciences facilities with pharmacy. Tehran University Medical Journal, 65: 12-15.

8. WHO/DAP/2004. How to investigate drug use in health facilities: selected drug use indicators. 1-6.

9. Binu M, Sabbu R, Surendra K, Hiremath D (2013) A Retrospective Analysis of Prescribing Practice Based on WHO Prescribing Indicators at Four Selected Hospitals of West Ethiopia. East and Central African Journal of Pharmaceutical Sciences.

10. http://pdf.usaid.gov/pdf.docs/PNADP {WHO Prescription pattern of inject able drugs}. Accessed date July8, 2011

11. Physicians medication prescribing in primary care in Riyadh City, Saudi Arabia (2004). Literature review: variation in drug prescribing 112:65-72.

12. Kermode M, Muani V (2003) Injection prescribing pattern in India. Indian J Med Res 134: 423-431.

13. Kermode M1, Muani V (2006) Injection practices in the formal & informal healthcare sectors in rural north India. See comment in PubMed Commons below Indian J Med Res 124: 513-520.

14. Tamuno I, Fadare JO (2012) Drug Prescription Pattern in a Nigerian Tertiary Hospital. Tropical Journal of Pharmaceutical Research 11: 146-152

15. Meskarpour-Amiri M, Dopeykar N, Ayoubian PMA, Motaghed Z (2015) A Study on the Factors Affecting the Prescription of Injection Medicines in Iran: A Policy Making Approach. Global Journal of Health Science 7: 291-297