Original Research Article

Assessment of medication prescription pattern at Bole health center, Ethiopia

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ABSTRACT

Background: Inappropriate use of medicines becomes a common global problem. The aim of this study was to assess the drug prescription patterns at Bole health center, using some of the World Health Organization (WHO) core drug use indicators.
Methods: A cross-sectional study was conducted to determine the current prescribing practices at the health center. A sample of 720 prescriptions was selected by using stratified random sampling method from 11,040 prescriptions written for the 5 month period from August 1- December 30, 2016. Data were collected from prescription papers filed in the pharmacy.
Results: The average number of drugs prescribed per encounter was 2.03. The percentage of encounters in which antibiotics prescribed was 67.36%. The proportion of drugs prescribed by generic name and from an essential drug list was 98.14% and 99.25%, respectively.
Conclusions: The prescribing practice for antibiotic and average number of medicines per prescription shows deviation from the standard recommended by WHO. Great emphasis should be given to restrict inappropriate use of antibiotics.

Keywords: Irrational drug use, WHO drug use indicators, Drug prescribing pattern

INTRODUCTION

Irrational use of medicines involves the use of a number of medicines per patient (poly-pharmacy); underuse or incorrect use of effective medicines; use of wrong or ineffective medicines; use of too many antibiotics; improper use of injections; inability to prescribe in accordance with treatment guidelines and inappropriate self-medication, frequently of prescription-only medicines.[1]

Irrational use of medicines becomes a common problem in health care systems of both developed and developing countries. Throughout the world, more than 50% of all medicines are prescribed and dispensed improperly, while half of patients neglect to take the prescribed medicines correctly as indicated by WHO 2012 report.[2] Besides, around 33% of the world population lacks access to essential medicines.[3,4]

Irrational use of medicines causes numerous harmful consequences including reduction in quality of

pharmacotherapy, loss of resources, high treatment cost, high risk of adverse medicine reactions, and emergence of medicine resistance.[5]

The habits of irrational prescribing lead to ineffective and unsafe treatment, exacerbation or prolongation of illness, distress and harm to the patient, and higher costs. The contributing factors for existence of irrational prescribing are inadequate training and education of prescribers, patient pressure, poor communication between health professionals, uncertainty of diagnosis and promotional activities of pharmaceutical industries.[6]

A national study on medication use indicators in public health care facilities in Ethiopia revealed that the average number of medications prescribed per encounter was 1.9 and percentage of encounters with antibiotic was 58.1%. The percentage of encounters with injection was reported as 23% and percentage of medications prescribed by generic name found to be 87%.[7]

Assessment of medicine prescribing practice in health institution is of vital importance in the current situation where irrational medicine prescribing and development of antimicrobial resistance is becoming very common. It is therefore, the study helps to identify specific medicine use problems, sensitize practitioners on rational medicine prescription and provide policy makers with relevant information that could be useful in reviewing medicine-related policies. The current study assessed the medicine prescribing pattern in the outpatient pharmacy of Bole Health center by using some of the WHO core drug use indicators.

METHODS

Study design and setting

A retrospective cross-sectional study design was conducted to describe the current prescribing practices at Bole health center, Ethiopia.

Sample size determination and sampling procedure

According to the WHO document "How to investigate drug use in health facilities," at least 600 encounters should be included in a cross-sectional study to describe the current prescribing practices, with a greater number, if possible.[8] In this study, 720 prescriptions were selected by using stratified random sampling method from 11,040 prescriptions written for the 5 month period from August 1, 2016- December 30, 2016. One hundred forty four prescription papers were taken from each month. From 144 prescriptions, 48 prescriptions were taken from 10 consecutive days by simple random sampling (lottery method).

Data collection

The data on prescribing indicators was collected by four trained pharmacy personnel retrospectively from filed prescriptions. The required data to measure the prescribing indicators were recorded for each patient encounter and entered directly into Microsoft Excel 2010.

Measurement tool

The WHO has developed and validated several indicators to provide an appropriate means to evaluate a nation's medication use pattern and to measure the efficacy of interventions. The indicators are highly standardized and are recommended for inclusion in the studies on drug use. They give a straightforward tool for rapidly and reliably evaluating various critical parts of pharmaceutical use in primary health care.[9]

The prescribing indicators that were measured include:

A. *The average number of drugs prescribed per encounter* was calculated by dividing the total number of different drug products prescribed by the number of encounters surveyed. Combinations of drugs prescribed for one health problem were counted as one.

B. *Percentage of encounters in which an antibiotic prescribed* was calculated by dividing the number of patient encounters in which an antibiotic was prescribed by the total number of encounters surveyed, multiplied by 100.

C. *Percentage of encounters with an injection prescribed* was calculated by dividing the number of patient encounters in which an injection was prescribed by the total number of encounters surveyed, multiplied by 100.

D. *Percentage of drugs prescribed from an essential drug list* (EDL) was calculated by dividing number of products prescribed which are in essential drug list by the total number of drugs prescribed, multiplied by 100.

E. *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.

Data analysis

The data entered was analyzed using Epi info version 7 software. In the statistical analysis, frequencies, averages/means, and percentages were obtained.

Quality control/assurance of data

The data collected at the Health Center was checked daily for completeness, clarity, validity and logical consistency by the principal investigator.

RESULTS

Seven hundred twenty prescription encounters were assessed retrospectively at the health center pharmacy

from August 1- December 30, 2016. A total of 1459 medicines were prescribed. The average number of medicines per prescription was 2.03 (with a range between 1 and 4). The total number of encounters prescribed with antibiotic and injection were

485(67.36%) and 139 (19.31%) respectively. About ninety nine percent of medicines were prescribed from the essential drug list of Ethiopia. The percentage of medicines prescribed by generic name was 98.14% (Table 1).

Table 1: Summary of results obtained at the health center pharmacy from August 1-December 30, 2016 (n=720 encounters).

S.no.	Prescribing indicators assessed	Total drugs/ encounters	Average/percent	Standard derived or ideal
1	Average number of drugs per encounter	1459	2.03	(1.6-1.8)
2	Percentage of encounter with antibiotics	485	67.36	(20.0-26.8%)
3	Percentage of encounters with injection	139	19.31	(13.4%-24.1%)
4	Percentage of drugs prescribed by generic	1432	98.15	100%
5	Percentage of drugs from essential drug list	1443	99.25	100%

Table 2: Commonly prescribed antibiotics at the health center pharmacy from August 1-December 30, 2016.

Antibiotics	Frequency	Percentage (%)
Amoxicillin	182	34.08
Ciprofloxacin	72	13.49
Cotrimoxazole	64	11.9
Cloxacillin	51	9.52
Doxycycline	51	9.52
Gentamycin	25	4.75
Metronidazole	21	3.97
Amoxicillin-Clavulanate	17	3.18
Tetracycline	17	3.18
Norfloxacin	13	2.4
Ceftriaxone	13	2.4
Others	8	1.5

Others: Ampicillin, Benzyl penicillin, Erythromycin, Claritomycin and Chloroamphenicol

Out of 1459 drugs prescribed, 534 (36.6%) were antibiotics. The most commonly prescribed antibiotics were amoxicillin 182 (34.08%), ciprofloxacin 72 (13.49%), cotrimoxazole 64 (11.9%), cloxacillin 51 (9.52%), doxycycline 51 (9.52%), gentamycin 25 (4.75%) and metronidazole 21 (3.97%) (Table 2).

DISCUSSION

The study indicated that the average number of drugs per prescription was 2.03 which is slightly higher than WHO standard (1.6-1.8). In a study on prescribing patterns in two hospitals in Ethiopia, the average number of drugs per patient was 1.9 at Hawassa University teaching and referral hospital and 1.8 at Dessie Referal Hospital.[10,11] The higher average number of drugs per prescription might be due to lack of therapeutic training of prescribers, shortage of first line medications or a patient has many co-existing medical conditions receiving treatment. In addition, in the case of diseases such as heart failure and high blood pressure, combinations of two or three different medications are common and recommended.

The percentage of encounters prescribed with antibiotic was 67.36% which is higher than the WHO recommended value (20-26.8%). But, the finding is also higher than the report from Uganda 56% and Wolkite (63%).[12,13] The high percentage of antibiotics prescribed in the facility may be due to prescribers face high work load leading to not to diagnose the patient properly; patient expectation to receive antibiotics; prescribers' belief that the therapeutic efficacy of antibiotics is low or inadequate training of prescribers. Clinicians tend to overestimate the severity of the illness to justify antibiotic prescribing.

Our study showed that the percentage of encounters prescribed with injection was 19.31% which found to be acceptable compared with the standard of WHO (13.4%-24.1%) and the value reported by FDREMOH in 2003 that is 23%.[7] The reason may be there is good communication between the prescribers and dispensers in the choice of appropriate dosage form for the patient in certain medical conditions in the health facility.

The percentage of drugs prescribed at the Health center from the essential drug list was 99.25%, which is almost

similar to the ideal value of 100% set by WHO and other studies results reported by Desalegn in 2013 from Hawassa University Hospital (96.6%) and Federal Democratic Republic of Ethiopia Ministry of Health (FDREMOH) national report in 2003 which is 99%.[7,10] However, lesser value was reported in Nigeria (88%).[14] This trend of prescription may due to special emphasis given by professionals (both prescribers and dispensers) to work according to the national drug list of the country and regular follow up made by the supervisors of the health institution.

The percentage of drugs prescribed by generic names at the Health Center was 98.14% which approaches the standard value set by WHO (100%) and higher than the national value reported by FDREMOH in 2003 (87%).[7] However, it is much higher than the one reported by Bhartiy and his co-worker in India (48.5%) in 2008.[5] Relatively higher number of generic medication prescription in the health center might be due to prescribers' awareness about advantage of generic prescription; the countries' medication procurement policy which promotes procurement by generic; and the existence of good discussion among health care providers in various professional sessions such as case presentation and drug and therapeutic committee meeting.

CONCLUSION

In this study, the prescribing pattern of antibiotics and number of medicines per prescription showed deviation from the standard recommended by WHO. Appropriate training on rational use antibiotics should be provided to health care providers. Extensive drug use evaluation should be done for some antibiotics. Strict policies should be implemented to use antibiotics in accordance with the standard.

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