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A Retrospective Analysis of Prescribing Practice Based on WHO Prescribing Indicators at Four Selected Hospitals of West Ethiopia: Policy Implication

J.L. LENJISA[1]* AND T.H. FEREJA[2]

[1]Clinical Pharmacy Unit, and [2]Pharmaceutical Chemistry and Pharmacognosy Unit, Department of Pharmacy, College of Medicine and Health Sciences, Ambo University.

A descriptive cross-sectional survey to determine prescribing practice of clinicians at four public hospitals in West Ethiopia was carried out. The study involved retrospective review of 2024 prescriptions received at the hospitals' outpatient pharmacies during the period between January and September 2013. The mean number of drugs per prescription was 2.1±0.5. The prevalence of generic, antibiotics and injections prescribing were 79.2%, 54.7% and 28.3%, respectively. Drugs prescribed from Ethiopian essential drug list/formulary constituted 83.0%, which is far less than the ideal limit. Further, all the prescribing indicators studied were out of the ranges recommended by World Health Organization implying that there is deep rooted irrational prescribing practice in public hospitals in Ethiopia. Thus, urgent and well organized interventions should be implemented in the country.

Key words: World Health Organization, prescribing indicators, rational drug use

INTRODUCTION

Indicators of prescribing practice measure the performance of health care providers in several key dimensions related to appropriate use of drugs. The indicators are based on the practice observed in samples of clinical encounters taking place at outpatient health facilities for the treatment of acute or chronic illnesses. World Health Organization (WHO) developed core prescribing indicators to measure the degree of polypharmacy, the tendency to prescribe drugs by generic name and the overall use of antibiotics and injections. The degree to which the prescribing practices conformed to the essential drug list, formulary or standard treatment guideline was also measured by determining the number of drugs prescribed from essential drug list [1].

Prescribers can only treat patients in a rational way if they have access to an essential drugs list and the essential drugs are available on a regular basis [2]. 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 [3].

Irrational prescribing has for long been known to be a feature of healthcare settings in developing countries, and is characterized by polypharmacy, excessive use of antibiotics and injections and use of drugs of doubtful efficacy [4]. This obviously compromises the provision of quality health care using available resources allocated to drug supply in these countries.

Several studies which have been conducted on prescribing practices of physicians at outpatient settings globally [2-5] as well as in Ethiopia [8-9] identified high degree of irrational prescribing especially with regard to antibiotics and injections. However, periodic assessment of the prescribing practices in a health facility is still necessary to identify specific drug use problems, sensitize practitioners on rational drug prescription and provide policy makers with relevant information that could be useful in the review of drug procurement policies and

*Author to whom correspondence may be addressed.

implementation of policies on drug prescribing practices in the affected institutions and regions. This retrospective cross-sectional survey was therefore meant to analyze the prescribing practice of clinicians using WHO prescribing indicators at four selected public hospitals in West Ethiopia.

MATERIALS AND METHODS

Study area and period

This study was conducted from January 2013 to September 2013 at four public hospitals located in West Ethiopia. These hospitals are located at different distances from the capital city, Addis Ababa, ranging from 126 km to about 500 km. The four facilities were selected systematically out of the eight public hospitals found in this region.

Study design

This study was a descriptive cross-sectional survey as per WHO drug use indicators. A retrospective analysis of a total of 2024 prescriptions randomly sampled in the outpatient pharmacies of the four selected hospitals was done by well-trained pharmacists. A standard data collection tool developed by the WHO was used for assessing prescribing indicators. These include average number of drugs per prescription, percentage of drugs prescribed by generic name, percentage of prescriptions containing antibiotics, percentage of prescriptions containing injectable drugs, and percentage of drugs prescribed from the latest edition of national essential drugs list (EDL, or formulary). Beside these core indicators, the authors also looked at the percentage of prescriptions with documented diagnosis which offers the pharmacists an opportunity to determine whether or not the prescribed medication is appropriate for the indication under treatment.

Data analysis

Statistical package for social sciences (SPSS) computer software version 20.0 was used for data analysis. Different prescribing indicators were computed using the following formulae adopted from the WHO manual for prescribing indicators assessment [1].

(a) Average number of drugs per encounter = Total number of drugs prescribed / Total number of encounters sampled.
(b) Percentage of drugs prescribed by generic name = (Number of drugs prescribed by generic name / Total number of drugs prescribed) × 100.
(c) Percentage of encounters with an antibiotic prescribed = (Number of patient encounters with an antibiotic / Total number of encounters sampled) × 100.
(d) Percentage of encounters with an injection prescribed = (Number of patient encounters with an injection prescribed / Total number of encounters sampled) × 100
(e) Percentage of drugs prescribed from essential drugs list = (Number of drugs prescribed from essential drugs list / Total number of prescribed drugs) × 100.

In addition to these, percentage of prescriptions with documented diagnosis was calculated as number of prescriptions with diagnosis over the total number of sampled prescriptions.

RESULTS AND DISCUSSION

The WHO prescribing indicators of drug use, namely the average number of drugs per prescription, percentage generic prescribing, percentage prescribing based on EDL, and percentage prescriptions with documented diagnosis, in the four selected hospitals are presented in Table 1. On average, each prescription carried 2.1±0.3 drugs with a range of 1.9 to 2.3 across the four studied hospitals. The WHO recommends that the average number of drugs per prescription should be less than 2 [1]. Higher values imply overprescribing [1]. Polypharmacy is one of the essential indicators of potential drug-drug interactions, risk of fatal combined or synergistic medication side effects, medication non-adherence and hence poor treatment outcomes that even can lead to death. Although the finding of this study is within the range of results reported from other parts of Ethiopia [8-10], it seems that overprescribing is

a worldwide problem as similar studies from other parts of the globe reported higher values ranging from 2.2 to 3.81 [2-7]. In general, such findings call for urgent and well organized interventions by pharmaceutical policy makers to tackle this bothersome problem of polypharmacy.

Table 1: Some WHO prescribing indicators of drug use in four public hospitals in West Ethiopia in the period January - September 2013

Indicators	Hospitals				
	AH (n = 500)	**GH** (n = 500)	**NH** (n = 512)	**GIH** (n = 512)	**Total** (n = 2024)
Average number of drugs per prescription	2.0±0.2	2.3±0.5	1.9±0.7	2.1±0.1	2.1±0.3
Number (%) of generic drugs	743 (72.8)	1040 (91.1)	771 (81.0)	752 (70.7)	3306 (79.2)
Number (%) of drugs from EDL	776 (76.1)	1142 (100)	768 (80.7)	781 (73.5)	3467 (83.0)
Number (%) of prescriptions with diagnosis	5 (1)	408 (81.6)	0 (0)	504 (98.4)	917 (45.3)

Key: n = number of prescriptions sampled; AH = Ambo Hospital; GH = Gedo Hospital; NH = Nekemte Hospital; GIH = Gimbi Hospital; EDL = essential drugs list.

In this study, the average generic prescribing was 79.2%, with a range of 70.7% to 91.1% across the four hospitals. The WHO recommends prescribing in generic name in a facility to be 100%. Increasing generic prescribing would promote rational use of drugs by minimizing confusion during dispensing and reduce the cost of securing brand drugs [1]. The 79.2% generic prescribing in this study is less than findings reported from south Ethiopia (98.7%) and southwest Ethiopia (92%) [8, 10]. However, other studies reported less than 50% generic prescribing especially in private health facilities with generic prescribing of 0% to 42.7% [4, 11, 14, 15]. Empirical evidence show that generic prescribing is a measure of the quality of prescribing in a given health facility and the cost of prescribed medications can determine the patients compliance level [17, 18]. Hence, prescribers working in different health facilities of west Ethiopia as well as in countries where such problems are deep rooted should increase level of generic prescribing in order to fully utilize its advantages in patient care. However, there are situations where generic prescribing is not mandatory. These include drugs with narrow therapeutic window and/or formulations having different bioavailability hence varying dosing frequencies [19].

Drugs prescribed from the hospitals' formularies averaged 83.0%, ranging from 73.5% in Gimbi Hospital to 100% in Gedo Hospital. Essential drug list/formulary of a given country is developed to promote rational use of medicines and also help to practice the most economic prescribing in health facilities. Prescribing of drugs from Ethiopian EDL is significantly lower in our study compared to the one recommended by WHO (100%) and other studies in Ethiopia which were 96.6% and 97% in south Ethiopia and southwest Ethiopia, respectively [8, 10]. Hence, the habit of prescribers not to rely on this document in our study and also in different countries should be addressed critically through strong supervision by the responsible

stakeholders, in this case, health care policy makers.

Of the total sampled prescriptions, less than half of them (45.3%) had a documented diagnosis for which drugs were indicated. Even though this figure is higher than the findings of similar studies [12, 16] in west Bengal (39.2%) and in Pakistan (43.3-79.0%), it would be better if writing diagnosis on prescriptions is a custom for prescribers in general even if not mandatory. This would help the pharmacists to identify some sort of inappropriate indications for the drug under consideration.

As shown in Figure 1, the prescribing of antibiotics was as high as 54.7% on average, ranging from 45.9% in Nekemte Hospital to 69.2% in Ambo Hospital. The WHO recommends that antibiotic prescribing should be less than 30% and if possible based on susceptibility test results against the responsible microorganisms. This is mainly to combat the emergence of multidrug-resistant microbes. The finding of the present study shows that there is overprescribing of antibiotics at the four study hospitals. Nevertheless, it is better than what had been reported (58-65%) in the country before [8-10,20]. In general, such irrational prescribing of antibiotics is very common in other African countries [4, 7, 21] too that need very stringent control by drug regulatory authorities of respective countries to halt the alarmingly increasing antimicrobial resistance in the developing world.

Figure 2 shows high prescribing of injectables. The percentage of prescriptions bearing an injectable averaged 28.3%, with a minimum of 10.2% in Nekemte Hospital and a maximum of 36.1% in Gimbi Hospital. Injections are very expensive compared to other dosage forms and require specialized training to administer. Furthermore, the use of injections can increase the risk of transmission of infectious agents such as hepatitis and human immunodeficiency viruses in absence of aseptic techniques. The WHO encourages the prescribing of injectable to be as low as less than 10%. However, with the exception of very few studies [2, 4, 13] that have reported prevalence rate of injection prescribing of less than 10% (ranging from 0.17% to 4%), overprescribing of injections (up to 46%) has been reported in most studies as is the case in the present study [5, 7, 14, 22, 23]. Overprescribing of injections is also common in other parts of Ethiopia where it ranges from 23% to 38.1% [8, 10, 20]. This calls for prescription auditing by regulatory bodies so as to facilitate tackling of this problem.

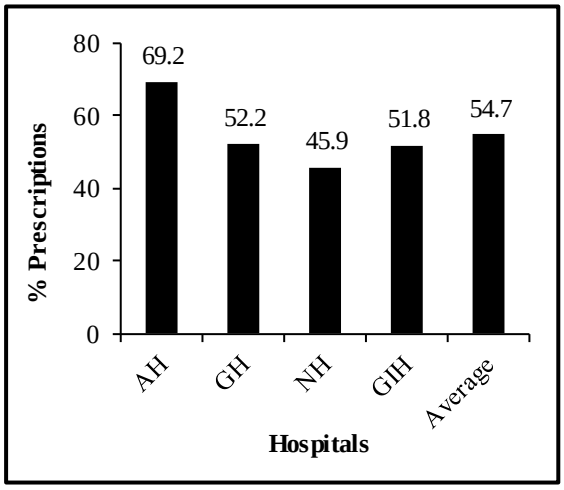

Figure 1. Percentage of prescriptions bearing antibiotics in the four hospitals in West Ethiopia. *AH = Ambo Hospital; GH = Gedo Hospital; NH = Nekemte Hospital; GIH = Gimbi Hospital.*

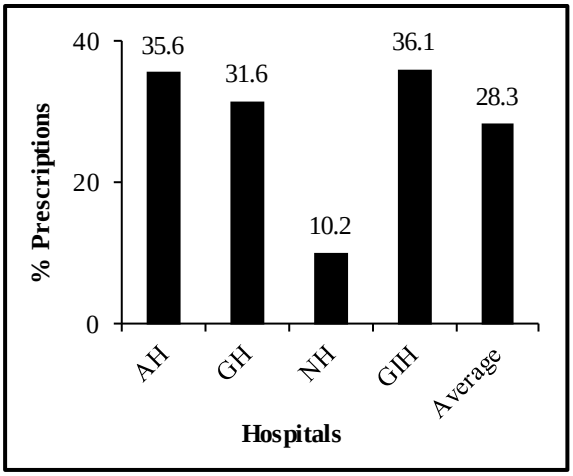

Figure 2. Percentage of prescriptions bearing an injectable in the four hospitals in West Ethiopia. *AH = Ambo Hospital; GH = Gedo Hospital; NH = Nekemte Hospital; GIH = Gimbi Hospital.*

CONCLUSION

In general, the findings of this study are in line what had been reported locally and globally from previous similar works. Average number of drugs per encounter, generic prescribing, and the use of EDL/formulary to prescribe drugs in this study is totally out of the recommended values and hence inappropriate. The study also revealed overprescribing of both antibiotics and injections. To promote rational use of drugs in the country, a number of recommendations may be drawn from these findings. Firstly, there should be functional drug and therapeutic committees in all hospitals in Ethiopia with capacity to control irrational use of medicines. Secondly, there should be countrywide continuous sensitization trainings and workshops for prescribers and pharmacists in Ethiopia on rational use of medicines especially antibiotics. Third, Ethiopia should fully utilize the knowledge of clinical pharmacists in outpatient departments of all health facilities in order to help prescribers in drug selection thereby promoting rational and economic use of medicines.

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