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Assessment of drug prescription practice using who prescribing indicators in Felege Hiwot referral hospital (FHRH) outpatient department, North Ethiopia

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ABSTRACT

Drug therapy is the most commonly used method of any disease treatment in general practice. However, the patterns of drug prescription are often inappropriate and the need for registration and evaluation of these patterns is essential in an effort to improve prescription standards. Cross sectional retrospective study was used. Prescriptions were selected by using simple random sampling technique from accumulated prescriptions over a period of six months (May 2013 to October 2013). The Data was evaluated using standardized World Health Organization prescription indicators for studies of rational drug use. Data was collected from prescriptions by using pre-prepared data collection tool. The average number of drugs per encounter was 1.83; with 97.4% drugs prescribed by generic names. 38% & 10.8% of the prescriptions contained encounters with antibiotics and injections use respectively. 100% of drugs prescribed were from the essential drugs list of Ethiopia. It is concluded from the study that the number of drugs prescribed per encounter, prescribing practices for injections, generic prescribing and prescribing from essential drug list are encouraging, whereas prescribing practices for antibiotic need to be regulated closely since study shows deviation from the standard recommended by World Health Organization guideline.

Key words: antibiotics, injections, essential drug list, generic name, rational drug use

INTRODUCTION

Medicines play an important role in health care delivery and disease prevention. The availability and affordability of good quality drugs along with their rational use is needed for effective health care. Drugs assume a major role in healthcare, both in terms of system management policies and in the practice of the professionals involved, as well as in patients' emotional references. Drugs also play an important role in protecting, maintaining and restoring health. In recent years the contribution of drugs to treatment of medical conditions has increased more rapidly than most non pharmaceutical approaches to disease. However the patterns of drug prescription are often inappropriate and the need for registration of these patterns is essential in an effort to improve prescribing standards [1]. Prescription is an order for medication, therapy, or therapeutic device given by a properly authorized person, which ultimately goes to a person properly authorized to dispense or perform the order. A prescription is usually in written form; can be emailed from a secure encrypted computer system written, phoned, or faxed. Prescription writing is a science and an art, as it conveys the message from the prescriber to the patient. Rational prescribing implies using the right drug for the right patient at the right time in the right dose and manner of administration, at affordable cost and with right information. As accepted by the WHO 'Rational use of drugs requires that patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements for an adequate period of time, and at the lowest cost to them and their community' [2] .

The consequences of excessive and inappropriate prescribing are many; wastage of public and private money, drug resistance, adverse reactions and increase in iatrogenic disease. In the field of

antibiotics use, resistance to newer antibiotics has been steadily increasing. The higher level of resistance tends to be found in developing countries with poor capabilities of monitoring of therapies and doses [3].

Drug utilization study, as defined by the WHO, is a structured process which is used to assess the quality of drug therapy by engaging in the evaluation of data on drug prescribing, dispensing and patient use in a given health care environment, against predetermined, agreed upon criteria and standards, with special emphasis on the resulting medical, social, and economic consequences [4].

Drug utilization studies seek to monitor, evaluate and suggest modifications in the prescribing practices with the aim of making the medical care rational and cost effective. A study of prescription patterns is an important tool to determine rational drug therapy and maximize utilization of resources. To improve the overall drug use, especially in developing countries, international agencies like the World Health Organization (WHO) and the International Network for the rational use of drugs (INRUD) have applied themselves to evolve standard drug use indicators4. These indicators help us to improve our performance from time to time [5, 6]. Worldwide, more than half of all medicines are prescribed, dispensed, or sold improperly, and 50% of patients fail to take them correctly. Moreover, about one third of the world's population lacks access to essential medicines [7]. A survey conducted in 8 hospitals in southern Ethiopia that investigated their prescription patterns concluded that irrational prescribing, as evidenced by high average number of drugs prescribed per encounter, high percentage of injections, and high percentage of antibiotic use, was prevalent in the studied region [8].

MATERIALS AND METHODS

Study design: A cross sectional retrospective study design was conducted

Study area: The study was conducted at FHRH, Bahir Dar, North-West of Ethiopia. It is referral hospital for Amhara Regional state and is found in Bahir Dar; the capital city of ANRS. It was founded in 1955 E.C. Since that time it is serving about 20,000,000 people being as the only referral hospital for many decades. Currently it is divided in to outpatient and inpatient departments. The pharmacy service is also divided into inpatient, outpatient and emergency pharmacy. The study was conducted in the outpatient pharmacy
.

Data collection and analysis: The specific types of data necessary to measure the prescribing indicators were recorded for each patient encounter and entered directly into pre-prepared prescribing indicator form. For this particular study, around 600 prescriptions were collected retrospectively from more than 3600 prescriptions accumulated over six month period from May 2013 to October 2013. This indicator study is also restricted to a sample of general illness encounters, representing a mix of health problems and patient ages. The sample was selected using a simple random sampling method. All data recorded in the pre-prepared prescribing indicator format were first analyzed using Microsoft Excel 2007.

Prescribing indicators: The WHO prescribing indicators were used in this study.
1. The average number of drugs prescribed per encounter was calculated to measure the degree of polypharmacy. It was calculated by dividing the total number of different drug products prescribed by the number of encounters sampled. Fixed dose combination products were counted as one drug.
2. Percentage of drugs prescribed by generic name was calculated to measure the tendency of prescribing by using generic name. It was calculated by dividing the number of drugs prescribed by generic name to total number of drugs prescribed, multiplied by 100.
3. Percentage of encounters in which an antibiotic was prescribed was calculated to measure the overall use of antibiotics. It was calculated by dividing the number of patient encounters with antibiotic use by the total number of encounters surveyed, multiplied by 100.
4. Percentage of encounters with an injection prescribed was calculated to measure the overall use of injections. It was calculated by dividing the number of patient encounters with injection use by the total number of encounters surveyed, multiplied by 100.
5. Percentage of drugs prescribed from an essential drug list (EDL) was calculated to measure the degree to which practices conform to a national drug policy. Percentage was calculated by dividing number of drugs prescribed which are in essential drug list by the total number of drugs prescribed, multiplied by 100.

Ethical consideration: Ethical clearance was obtained from institutional review board of Bahir Dar University. The data obtained from the patient information cards were used only for the research purpose.

RESULTS

A total of 600 prescriptions that had complete information were analyzed. A total of 1098 drugs were prescribed of which most are analgesics and antibiotics. In this study the lowest average number of drugs per prescription was (1.66) which occurred in July/2013, while the highest average number of drugs per prescription was 1.96 which occurred in August/2013. The overall mean of drugs per prescription for this hospital studied for seven consecutive months was 1.83 (figure 1). Analysis of antibiotics use showed that prescription of one or more antibiotics per prescription ranges from 30% which is the lowest and 49% the highest recorded on June/2013 and August/2013, respectively. The average percentage of prescriptions containing one or more antibiotics was 38% (figure 2). The number of patients who received one or more injection per prescription ranges from a minimum of 7% in June/2013 to a maximum of 15% in August/2013, respectively. The average injection encounters was 10.8% (figure 3). The lowest percentage of prescriptions with generic names was found in May/2013 (94%), while the highest was in July/2013 (99%). The average percentage of drugs prescribed with their generic name was 97.4%. The overall percentage of drugs prescribed from the essential drug list of Ethiopia (EDL) was 100%.

DISCUSSION

The reference value for average number of drugs in WHO guidelines on rational use of drugs per prescription is 1.6 - 1.8 [9]. The present study revealed that the average number of drugs prescribed per prescription is 1.83 which is acceptable compared with the standard as well as other similar studies done locally and abroad. In similar study done in south west of Ethiopia at Jimma Hospital, the average number of drugs per encounter was 1.59 [10]. However, in a study on prescribing patterns in hospitals in north Ethiopia, the average number of drugs per patient was 1.3 at Gondar Hospital and 2.2 in Debre Tabor Hospital [11]. A national baseline study on drug use indicators in Ethiopia in September 2002 also found the average number of drugs prescribed per encounter to be 1.9 [12]. In the study of drug use patterns in 12 developing countries, the average number of drugs per encounter was high in Nigeria (3.8) Pakistan (4.1), low in Sudan (1.4), and in Zimbabwe (1.3) [13-16]. Among the likely negative effects of prescribing many drugs per prescription, are increased incidences of side effects, drug-drug interactions, confusion where aged patients are involved, non-compliance by patients to the drug regimen as a result of the large number of drugs to be taken at a time and for prolonged periods in most cases. A relationship has been described between polypharmacy and chronic polypharmacy; the prescription of multiple medicines in itself a predisposing factor to adding further drugs [17]. Studies have also shown a clear relationship between polypharmacy and under prescribing, a situation in which an indicated drug was not prescribed even as no reasons could be found for not prescribing it. The probability of under prescription increases significantly with the number of medicines. This has been shown to result in the so called treatment risk paradox or risk treatment mismatch where patients at highest risk for complications have the lower probability to receive the recommended pharmacological treatment [18]. The WHO recommends a 100% prescription of drugs using their generic name [9]. The percentage of drugs prescribed by generic name in this study is 97.4%. Even though it is lower than the expected WHO standard, it is better as compared to other studies. In a study carried out at Jimma Hospital, south west Ethiopia, the percentage of drugs prescribed by generic name was 75.2% [10]. A national baseline study on drug use indicators in Ethiopia in September 2002 also showed the percentage of drugs prescribed by generic name to be 87% [12]. In the study of 12 developing countries, the percentage of generic drugs prescribed was low in Nigeria (58%) and Sudan (63%) but was encouraging in Tanzania (82%) and Zimbabwe (94%) [13-16, 19]. The newly applied system reformation in the pharmaceutical and hospital setup of FHRH is ascribed to be the reason for this closer alliance with the WHO guideline.

Low generic prescribing could add confusion of patients who are already faced with the burden of polypharmacy. This no doubt, could lead to duplication errors where patients may unknowingly take the generic and brand products of same drug simultaneously. Generic prescribing is an indicator of prescribing quality [20]. Moreover, patients who use at the primary health care level to buy drugs, the drugs available are mostly restricted to the essential drugs which are usually written in generic names and supplied by the government. So patients may get problem in searching drugs that are written with brand names [21]. The percentage of encounters in which antibiotics were prescribed at FHRH is 38% which is high compared to the standard (20% - 26.8%) derived to be ideal [9] and better than a study done in Hawassa University Hospital which was 58% [22]. A national baseline study on drug use indicators in Ethiopia in September 2002 also showed that the percentage of encounters in which an antibiotic was

prescribed to be 58.1% [12]. In the drug use pattern study in 12 developing countries, the percentage of encounters in which an antibiotic was prescribed was high in Sudan (63%), Uganda (56%), and Nigeria (48%) and relatively better in Zimbabwe (29%) [13-16, 19, 23].

Prescribing of antibiotics without laboratory validation for its indication promotes multidrug resistance of microbes which in turn result in use of highly efficacious antibiotics for otherwise mild bacterial infections. The resistance problem also affects the health condition of the community and will incur extra cost for the government and community to resolve the problem. At such instance these drugs either become unaffordable to most patients and/or encourage poor compliance [21]. In our study the percentage of encounters in which an injection prescribed is 10.8%, which in line with the WHO standard (13.4% - 24.1%) [9]. A national baseline study on drug use indicators in Ethiopia in September 2002 found the percentage of encounters with an injection to be 23%, which is in the acceptable range [12]. In a study done in Hawassa University Hospital it was 38.1%, which is higher than the standard [22]. In a prescription pattern study in 12 developing countries, the percentage of encounters in which an injection was prescribed was high in Uganda (48%) and Sudan (36%) but very low in Zimbabwe (11%), and in the acceptable range in Indonesia (17%), Ecuador (17%), and Mali (19%) [13-16, 19, 23, 24]. Nowadays, an urgent need arises to reduce injection use in developing countries to prevent infections such as HIV and other blood borne pathogens and also to reduce health care costs due to injection related bacterial infections that took a substantial fee on health care budget.

According to WHO, prescribed drugs should be found in the essential drug list of a country [9]. In our study we get 100% which is the same as the value put as a standard which is very encouraging. Study done in Hawassa University Hospital was 96.6% [22]. A national baseline study on drug use indicators in Ethiopia in September 2002 showed that the percentage of drugs prescribed from the essential drug list to be 99%, [15]. In a study of prescription patterns from 12 developing countries, the percentage of drugs prescribed from the essential drug list was 88% in Tanzania and 96% in Nepal [19, 24]. Essential drugs list (EDL) is the list containing drug items essentially used to treat or manage common or readily encountered diseases and/or disorders. Thus the higher the compliance with this list, the more rational the drug prescribing pattern. The EDL of Ethiopia can be accessed from Food, Medicine and Health Care administration and control Authority of Ethiopia (FMHACA) [25].

CONCLUSION

Based on the results obtained in this study, it can be concluded that the number of drugs prescribed per encounter, generic prescription and percent EDL prescription are encouraging. Injection prescribing practice is also very good. These results are indicators of the changes brought after recent system reformation of FHRH. On the other hand the use of antibiotics is somewhat high therefore it may need a regulation in prescription of antibiotics. .

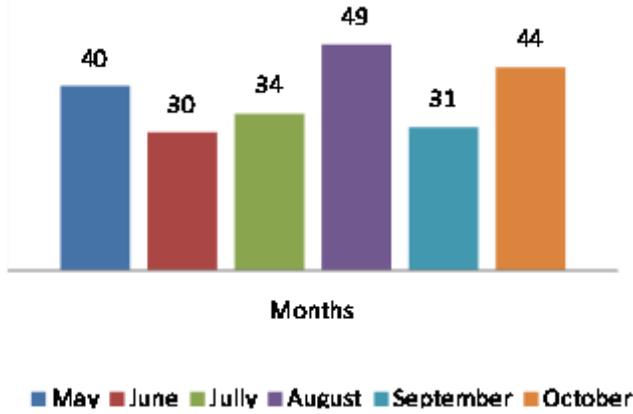**Figure 1: Average number of drugs per prescription**
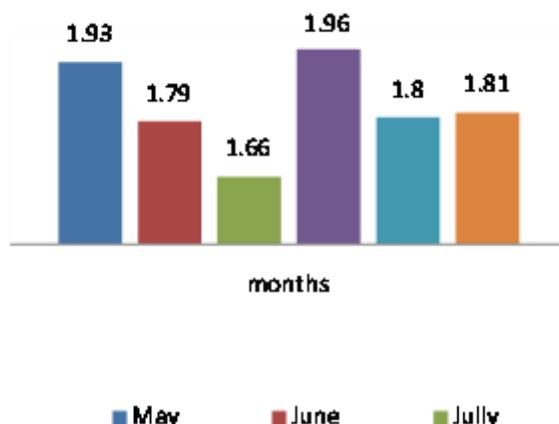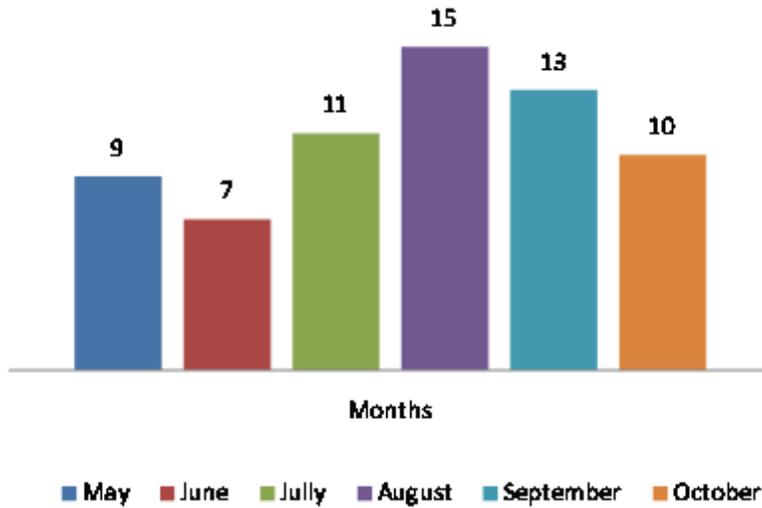
Figure 2: Percent encounter with antibiotics
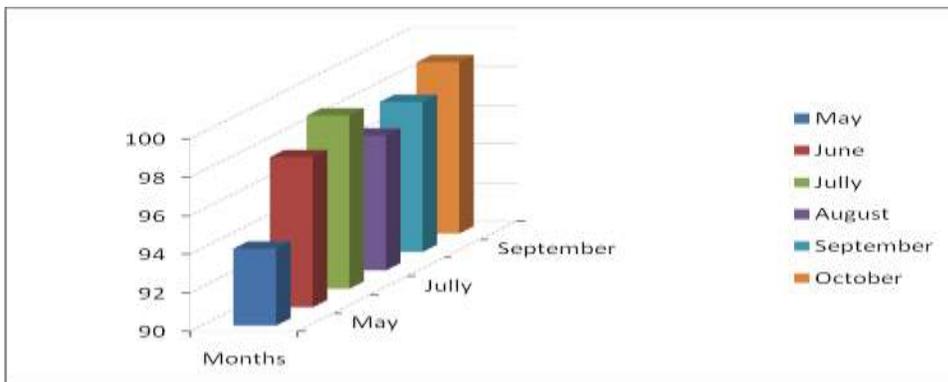

Figure 3: Percent encounter with injection

Figure 4: Percent generic prescription

Table 1: The results of prescribing indicators in FHRH from May/2013-October/2013 using retrospective study

Months	Number of prescriptions analyzed	Mean number of drug	Generics (%)	Antibiotics (%)	Injections (%)	EDL (%)
5/2013	100	1.93	94	40	9	100
6/2013	100	1.79	97.8	30	7	100
7/2013	100	1.66	99	34	11	100
8/2013	100	1.96	97	49	15	100
9/2013	100	1.8	97.8	31	13	100
10/2013	100	1.81	98.9	44	10	100
$\sum$600		1.83	97.4	38	10.8	100

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