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Short Communication

Drug use pattern in Dessie Referral Hospital, North East Ethiopia

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Rational drug use requires that patients receive medication appropriate to their clinical needs, in doses that meet their individual requirements, for adequate period of time and at lowest cost to them and their community. The study was designed to assess rational drug use using World Health Organization (WHO) core drug use indicators in Dessie Referral Hospital, North East Ethiopia. Cross sectional study design was employed to conduct the study from May 15 to 30, 2012. Data was collected retrospectively by using structured observational check list for prescribing and patient care indicators, respectively. The result showed that the average number of drugs per encounter, percentage of encounters with antibiotics, percentage of encounters with injections and percentage of drugs with generic name were 1.79, 48.2, 42 and 89.2%. Results of patient care indicator studies indicated average consultation time of 4.04 min, average dispensing time of 51.6 s, 92.6% of drugs were actually dispensed, 13.65% adequately labeled and 65% of patients retrieved the dose and frequency of administration of the dispensed drugs. Except average number of drugs per encounter, other indicators showed more or less potential drug use problems as compared to WHO criteria.

Key words: Rational drug use, prescribing indicators, patient care indicators, Dessie Referral Hospital, outpatient pharmacy.

INTRODUCTION

Rational drug use is proper prescribing, proper dispensing and proper patient use of drugs for diagnosis, prevention and treatment of diseases for benefit of the patient. To use drugs rationally, it requires that patient receive medicines appropriate to their clinical needs, in doses that meet their individual requirements for adequate period of time, and at the lowest cost to them and to the community (Management Science for Health, 1997). Rational drug use is generally concerned with promoting quality of care and cost- effective therapy, preventing unnecessary exposure to side effects; maximizing therapeutic benefits; and improves patient compliance (Drug administration and control authority of Ethiopia, 2003).

Pharmaceuticals may constitute up to 40% of the health care budget in developing countries, yet large

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portion of the population frequently lack access to even most essential drugs (Management science for health, 1997). World Health Organization (WHO) estimates that more than half of all medicines are prescribed, dispensed or sold inappropriately, and that half of all patients fail to take them correctly; the overuse, underuse or misuse of medicines results in wastage of scarce resources and wide spread of health hazards (Drug administration and control authority of Ethiopia, 2003). The best way to investigate drug use in health facilities is usage of indicators created and validated by WHO as they have proven to be both feasible to measure and give information as first line indicators during field testing in a number of developing countries. There are three major groups of core drug use indicators namely prescribing indicators (Average number of drugs per encounter, Percentage of drugs prescribed by generic name, Percentage of prescribed drugs from essential drug list, Percentage of encounters with injection prescribed and Percentage of encounters with antibiotics prescribed); patient care indicators (Average consultation time, Average dispensing time, Percentage of patient knowledge of correct doses, Percentage of drugs adequately labeled and Percentage of drugs actually dispensed) (WHO, 1993).

In 1989, the International Network for the Rational Use of Drugs (INRUD) was formed to conduct multi-disciplinary intervention research to promote the rational use of medicines. In 1993, WHO and INRUD developed and published a standard methodology for selected (core) drug use indicators in health facilities. There may not exist objective norms to follow strictly either core drug use indicators or may vary according to local health condition. There is an overall understanding in several developing countries as developed by the WHO (WHO, 1993).

In 2003, Drug Administration and Control Authority of Ethiopia reported that commonly observed irrational prescribing are extravagant prescribing, over prescribing, under prescribing, incorrect prescribing and multiple prescribing. This causes impact on either the health care system or the patient (Drug administration and control authority of Ethiopia, 2003). Above all, though drugs are not absolutely safe, proper usage is beneficial as much as possible. Therefore, this study focused on assessing rational drug use using WHO core drug use indicators in Dessie Referral Hospital (DRH), North East Ethiopia. The study will help the concerned individuals (for example, drug supply managers, prescribers, dispensers, and patients) to be aware of the actual situation and improve their drug use patterns.

MATERIALS AND METHODS

Descriptive cross sectional study design was employed to assess rational drug use in DRH, North East Ethiopia from May 15 to 30, 2012. A total of 361 prescriptions and 110 patients were included in the study. A systematic sampling technique was employed to select 361 outpatient prescriptions from the total of 6,050 prescriptions that have been dispensed in the hospital, outpatient pharmacy from March 28, 2012 to May 28, 2012. Patient attendants were selected by convenient sampling technique prospectively during the days of study period. Illegible prescriptions and those containing only medical supplies and patient attendants outside the normal working hours in the study period and care givers were excluded from the study. The dependent variables were prescribing indicators, patient care indicators and health facility indicators, whereas the independent variables are age, sex and educational status. Data regarding prescribing indicators was taken from sampled prescription records retrospectively and filled in structured check list accordingly by careful observation. On the other hand, data regarding to patient care indicators was taken from patient attendants and their prescriptions during the day of data collection and was recorded in observational patient care check list. Among patient care indicators, data regarding to patient knowledge of correct dosage was collected through face to face interview. The data was analyzed using SPSS (v. 15).

Percentage of drugs prescribed in generics was calculated by dividing the number of drugs prescribed by generic name to the total number of drugs prescribed, multiplied by 100. Percentage of prescriptions with antibiotics was calculated by dividing number of patient encounters with an antibiotic prescribed by the total number of encounters surveyed, multiplied by 100. Percentage of prescriptions with injections was calculated by dividing the number of patient encounters with an injection by the total number of encounters surveyed, multiplied by 100. Average consultation time was calculated by dividing total time for a series of consultations, by the number of consultations. Average dispensing time was calculated by dividing the total time for dispensing drugs to a series of patients, by the number of encounters. Percentage of drugs actually dispensed was calculated by dividing the number of drugs actually dispensed at the health facility by the total number of drugs prescribed, multiplied by 100. Percentage of drugs adequately labeled was calculated by dividing the number of drug packages containing at least drug name and strength and dosage, by the total number of drug packages dispensed, multiplied by 100. Patient's knowledge of correct dosage was calculated by dividing the number of patients who can report the dosage schedule for all drugs, by the total number of patients interviewed, multiplied by 100.

Essential drug list (EDL) (a list of drugs considered optimal treatment choices for the prevalence health problems of certain population) or formulary (a summary of drug information, which commonly includes generic name of the drug, its indication for use, dosage schedules, contraindications, side effects, and important information that should be given to the patient) or standard treatment guideline (STG) (systematically developed protocols and treatments that support prescribers on deciding on appropriate treatments for specific clinical problems) availability was checked by saying yes or no. Key drugs availability was calculated by dividing the number of specified products actually in stock by the total number of drugs on the checklist, multiplied by 100.

RESULTS

Out of 361 prescriptions, the total number of drugs found was 644 and the average being 1.78. One hundred and seventy four prescriptions were found to have antibiotics

Table 1. Drug prescription pattern in DRH, May, 2012.

Prescription indicator	Percentage (%)
Average number of drugs per encounter	1.78
Drugs prescribed with generic name	82.20
Prescriptions with antibiotics	48.20
Prescriptions with injections	42.00
Drugs prescribed from EDL	96.50

EDL- Essential drug list.

Table 2. Distribution of patient care indicators in DRH, May 2012.

Patient care indicator	Percentage (%)
Average dispensing time (seconds)	51.60
Average consultation time (minutes)	4.04
Drugs actually dispensed	92.60
Drugs adequately labeled	13.65
Patients who know correct dosage	65.00

Table 3. Results of facility indicators in DRH, May, 2012.

Health care indicator	0/1
Availability of essential drug list (EDL) Yes/ No*	0
Availability of standard treatment guideline (STG) Yes/No*	1
Availability of national formularies Yes/No*	0
% availability of essential drugs	65.70

Yes/No*, Yes=1, No=0.

prescribed and the percentage was 48.20%. Amongst 151 prescriptions having injections, 57.60% of prescription contained one injection, 24.30% had two injections, and 18.10% of the prescription contained three or more injections. The percentage of encounters with injections prescribed was also found to be 42.00% (Table 1).

The time spent for dispensing for series of patients/clients was found to be 5,678 s, the average being 51.60 s. On the other hand, the total consultation time was 444.40 min; the average was 4.04 min. From 187 drugs prescribed to 110 patient attendants, 173 were actually dispensed. As a result, the percentage of drugs actually dispensed was calculated to be 92.60%. Out of 173 drugs actually dispensed, 24 drugs were labeled with a minimum of dose and frequency of medication. The percentage of drugs adequately labeled was found to be 13.65%. From total patient attendants, 72 were able to repeat a minimum of dose and frequency of medication. Hence, the percentages of patients who have knowledge on the correct dosage of dispensed drugs were 65 % (Table 2).

During the study of health facility, out of 220 drugs that must be present in DRH, only 145 essential drugs and biologicals were already available. Therefore, the percentage availability of essential drugs surveyed was found to be 65.70%. Investigations on the availability of some standard medical books showed the availability of STG but absence of EDL and national formularies (Table 3).

DISCUSSION

Irrational use of drugs has been a persistent global problem. The main problems associated with drug use are related to irrational prescribing, irrational dispensing, and irrational patient consumption of drugs. According to this study only the average number of drugs per encounter exist in the optimal range of the WHO criteria while other specific indicators were more or less, deviated

from the international standards (Management science for health, 1997; WHO, 2010). The average number of drugs per encounter, in this study, was 1.79 which is slightly higher than studies conducted in Jimma university specialized hospital out-patient pharmacy and Gondar university hospital special pharmacy with the same value of 1.76. It also exists in the range that was conducted in Latin American countries (1.2 to 2.4), in Southern Ethiopia of eight hospitals (1.7 to 2.7) but lower than studies conducted in India, Nigeria, Pakistan, Eritrea and Indonesia, with a degree of poly pharmacy of 2.9, 3.8, 3.5, 2.2 and 3.3, respectively. Besides, the value is in optimal range of WHO criteria which is less than two (Dikaso, 1995; Yenet, 2005).

The reason behind lower value of average number of drugs per encounter is associated with lower number of drugs (usually one or two drugs) prescribed per prescription paper. This study showed that 44.8% of the prescription contained only one drug, 37.8% two drugs and the rest 17.4% of prescription had three or more drugs. Around 80% of prescription had either one or two drugs, which makes the average less than two. The rate of multiple prescribing is a little more than other studies conducted in different parts of Ethiopia (such as Jimma and Gondar). Multiple prescribing (poly pharmacy) may be beneficial to treat multi drug resistant organisms, and a reasonable combination of drugs are recommended. However, the greater degree of poly pharmacy is associated with drug-drug interactions, and adverse drug reactions. In this study the lower value of drugs per encounter will reduce the risk of drug-drug interactions and adverse drug reactions mainly in developing countries, like Ethiopia, having a poor capability of monitoring therapy. Besides, the cost of drug therapy will be reduced with a remarkable rate (Desta, 1997; Yenet, 2005; Ashenafi, 2009; WHO, 2010).

In this study, percentage of encounters with antibiotics prescribed was found to be 48.2%. Furthermore, it was obtained that some of the prescriptions contained more than one antibiotic. Amongst encounters containing antibiotics, 75.4% of encounters contained one antibiotic only while the rest contained more than one antibiotic per prescription. This value is higher than many developing countries in which the percentage of prescriptions containing antibiotics range from 25 to 40%, Latin American countries (27 to 39%), India (39.6%), Zimbabwe (29%) and Jimma (25.6%). On the other hand, this rate is almost similar to the mean value of encounters with antibiotics conducted in eight hospitals of Southern Ethiopia (Dikaso, 1995; Yenet, 2005; Karanda and Sankae, 2007).

The value (48.2%) exceeds the upper limits of WHO criteria (<30%) by more than 18%. In tropical counties where greater chance of bacterial infection is probable, up to 30% of encounters should contain one or more antibiotics. However, this value signifies a potential drug use problem in the study area. In addition, overuse of antibiotics, in this study, may be due to surgical prophylaxis, and adjunct treatment to in-patients admitted in the hospital associated with debilitating illness, to which antibiotics are mainly dispensed. Misuse or overuse of antibiotics, which are effective in treatment of infectious diseases, leads to emergence of resistant bacteria strain, and are now becoming a great global concern. Antibiotic resistance is not only a problem for individual patient, it also reduces the effectiveness of established treatment and poses major threat to public health by increasing the complexity and cost of treatment, and reducing the probability of a successful outcome. The high prevalence of encounters with antibiotics may also be associated with improper and lack of adequate diagnostic tools. As a result, antibiotics are now being prescribed in non-bacterial disease and as preventive purpose for surgery and hospitalized patients (Management science for health, 1997; WHO, 2010).

Most of the time, an effective route of administration is mandatory for better outcome in therapy. In this study, the percentage of encounters with injections prescribed was 42%. This percentage value is higher than studies conducted in Latin American countries (1 to 17%), Zimbabwe (11%), Southern Ethiopia (4 to 43%) and Jimma (2.9%). On the other hand, more than this value was registered in counties like Indonesia (over 60%), Ghana and Pakistan (over 50%) (Dikaso, 1995; Yenet, 2005). The high value of encounters with injection may be due to frequent emergency services and high rate of in-patient admission in the hospital. The WHO criterion indicates that less than 10% of encounters should contain injections. Oddly enough, this value is more than four times the WHO standard. Even though injections are preferable to debilitating illness, acute toxicity, and/or other cases which require rapid onset and quick management to save life, indiscriminate use of injections is accompanied with variety of disadvantages such as the development of sepsis at injection site, the risk of tissue toxicity, physiological pain factor, difficulty of correcting errors, risk of transmitting infections like HIV, hepatitis B, and are costly.

In the presence of more affordable, easier and appropriate oral formulations, routine use of injections should be discouraged (Management science for health, 1997; WHO, 2010). The existence of a number of brand products for single drug can significantly confuse patients as well as health care providers including pharmacy professionals and leads to potential errors. In this study, percentage of drugs prescribed by generic name was found to be 89.2%. This value is lower than studies conducted in Zimbabwe (94%), but higher than studies conducted in Jimma university specialized hospital (87.15%), in Southern Ethiopia (78%) and Latin American

countries (37 to 72%). Even though this value is encouraging, when compared with other studies, it is lower than the ideal value set by the WHO (nearly 100%) (Management science for heath, 1997; Desta et al., 2002; Yenet, 2005).

In the presence of generic versions which have overall advantage, prescribing by brand name of drug products is costly and confusing to the patient. Besides, this irrational prescribing practice promotes perverse financial incentives between prescribers and dispensers as well as reduce readily availability of essential drugs to the patients at all times and place. In this study, the lower value of percentage of generics as compared to WHO criterion is attributable to lack of adequate information to prescribed drugs, and also authorized prescribers order drugs of interest in specific brand name. In addition, they discriminate different brand products of the same drug and prescribe what they assume more effective without any reasonable evidence (WHO, 2010).

In this study, the average consultation time was found to be 4.04 min which is too short to undergo definite diagnosis and to convey necessary information to the patient. Research conducted in limited number of countries showed that a consultation time less than 5 min is inadequate. Furthermore, the average dispensing time was 51.6 s which in turn is very short to adequately label the drug to be dispensed and to provide sufficient and independent drug information to the patients/caregivers. Other studies showed that dispensing time less than 2 min (120 s) are unsatisfactory. There was no vivid information gained to quantify the consulting and dispensing process based on the WHO. The average consultation time was similar to the mean value of studies conducted in 10 developing countries (4.0 min), but the dispensing time was lower than the mean value of these studies (105 s). The short consultation time is associated with saving time and act of negligence for care of patients as observed in this study. Besides, the short dispensing time is associated with absence of labeling and/or lack of adequate labeling materials, and also the high out-patient visit per day makes the dispensers busy so that no sufficient time to effectively communicate with each patient (WHO, 2010).

Patients enter health facilities with set of symptoms and complaints, and with the expectation about the care they receive; they typically leave with package of drugs or with prescription to obtain them in private market. In this study, the percentage of drugs actually dispensed was found to be 92.6%. This value resembles the mean value of researches conducted in 10 countries from 1988 to 2002 (89%). Even though it is encouraging, it is lower than WHO criterion which is approximately 100% (Drug administration and control authority of Ethiopia, 2003). This may be due to lack of drugs in the study hospital and in some conditions due to inability of dispensers in reading reading prescriptions.

The right drug with right dosage form indicated for patient condition must be delivered to the right patient in prescribed dose and quantity with clear instructions and the package that maintains the potency and stability of the drug. In this study, the percentage of drugs adequately labeled was found to be 13.65% which is too low as compared with researches done in several developing countries. Besides, the ideal value of WHO criteria in this respect is nearly 100% (Drug administration and control authority of Ethiopia, 2003; WHO, 2010). Therefore, there is a significant deviation from global standard and greater emphasis should be given. The low value is more or less related with absence of adequate labeling and/or no labeling materials, act of negligence for patient care and lack of sufficient time. In addition, absence of pharmacist in dispensaries who have better knowledge of patient care worsens this problem. So much more, dispensaries are occupied by druggists who are busy to label drugs for large number of patient attendants. Oddly enough, central nervous system drugs are now being dispensed without labeling.

Beyond, the irrational prescribing and dispensing practice, irrational patient use of drugs are also commonly observed. Patients often forget what they are told about dispensed drugs. Hence, they do not adhere to the prescribed treatment. They often take drugs in wrong way either reducing the dose to make the treatment last longer or increasing it in the hope of quicker cure. In this study, the percentage of patients who adequately repeated the dose and frequency of each drug dispensed was found to be 65%. The rest 35% of patients missed how to follow the definite dosage regimen. This problem of forgetfulness increases when the degree of poly pharmacy at the same time increases. Therefore, the patient can miss any one of the drug dispensed. This value is almost comparable to studies conducted in several developing countries. However, there is a significant deviation from WHO criteria (100%) (Drug administration and control authority of Ethiopia, 2003; WHO, 2010). Lack of adequate drug information, as well as short contact time with pharmacy professionals, aggravate the risk of forgetfulness and misuse of drugs.

In the study conducted about the availability of health facility indicators, the percentage availability of essential drugs was found to be 65.7%. Based on the WHO criteria, essential drugs are those that satisfy the majority health care needs of the population. They are intended to be available within the context of functioning health care system at all times with reasonable cost (Management science for health, 1997; WHO, 2010). The result of this study showed a significant deviation from stated criterion. The reason behind is that all the essential drugs listed in EDL are not available rather one drug in each drug classes (for example, Nifedipine under calcium channel

blocker, Gentamicin under aminoglycosides) is often available. As a result, other therapeutic alternative essential drugs, which are highly effective in specific compelling indications, are not available. Besides, numerous studies have documented the impact of STGs and EDL on the availability and proper use of medicines in health care systems. All of this is even more important in resource poor settings where the availability of drugs is often erratic. In this study, national standard treatment guidelines are available, but national formularies, formularies of the hospital itself, national EDL are not available. EDL is meant to guide the selection, procurement, production, distribution and storage of drugs. Availability of medical standard books (materials) serves as an informational and educational tool for health care professionals involved in diagnosis and treatment of diseases as well as dispensing of medicines. Above all, they can improve the availability and promote rational use of medicines (WHO, 2010).

In summary, amongst the core prescribing indicator studied, only the average number of drugs prescribed per encounter exists within optimal value as compared to WHO criteria. However, in other prescribing practice, there is more or less a drug use problem.

Conflict of interest

Authors declare that they have no competing interests.

REFERENCES

Ashenafi M (2009). Assessment of prescribing practice using WHO core prescribing indicators in Gondar University hospital, special pharmacy, North West Ethiopia. East Afr. Med. J. 6: 112- 123.

Desta Z, Abula T, Beyene L, Fantahun M, Yohannes AG, Ayalew S (1997). Assessment of rational drug use and prescribing in primary health care facilities in North West Ethiopia. East Afr. Med. J. 74:758–63.

Desta Z, Abula T, Ganes A, Worku A (2002). Prescribing pattern of drugs for outpatient in three hospitals in North West Ethiopia. J. Health Dev. 16: 183-189.

Drug administration and control authority (DACA) (2003). Training modules on operation and management of special pharmacies, 2nd ed. Ethiopia. Addis Ababa.

Karanda S, Sankae P (2007). Pattern of prescription and drug dispensing in municipal medical college and general hospital, India. Ind. J. Pharm. 8:128-139.

Management sciences for health (MSH) (1997). Managing drug supply, 2nd ed. Kumarian Press, West Hart Ford, Conn. USA.

WHO (2010). How to investigate drug use in health facilities: selected drug indicators, action program on essential drugs, Geneva.

Yenet W (2005). Base line survey on drug prescribing indicators for outpatient in Jimma University specialized hospital in South west Ethiopia. East Afr. Med. J. 12: 142-156.

WHO (1993). How to investigate drug use in health facilities in selected drug use indicator. EDM Research series, No 07.