ORIGINAL ARTICLE

BASELINE SURVEY ON DRUG PRESCRIBING INDICATORS FOR OUTPATIENTS IN JIMMA UNIVERSITY SPECIALIZED HOSPITAL, SOUTHWEST ETHIOPIA

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ABSTRACT

BACKGROUND: ***The extent of drug use is directly affected by prescribing behavior of physicians. The best way to investigate drug use in health facilities is usage of indicators developed by World Health Organization as they have proved to be both feasible to measure and informative as first line indicators during field testing in a number of developing countries.***

OBJECTIVES: ***To measure prescribing indicators for out patients in Jimma University Specialized Hospital where measured values could be used later as baseline data for further follow up of quality of drug use.***

METHODS: ***A retrospective survey of prescribing pattern was carried out using prescription records in out patient pharmacy to measure the prescribing indicators by collecting prescription records of March 2004 to May 2004 over three months period. A total of 660 prescriptions containing 1179 drugs were collected, reviewed and analyzed against core prescribing indicators.***

RESULTS: ***The study revealed that the average number of drugs per encounter was 1.76. Percentage of encounters with an antibiotic prescribed was 25.6%, while percentage of encounters with injection prescribed was 2.9%. Percentage of drugs prescribed by generic names accounted 87.1%.***

CONCLUSION: ***In the present study setup, the incidence of polypharmacy was very low. The use of antibiotics and injections is lower compared to other studies. Lower percentage of injections prescribed is advisable, particularly in the HIV/AIDS era and moreover the repeated use of injections carries the risk of abscess formation and transmission of fetal infections.***

KEY WORDS: ***base line survey, drug prescribing indicators, out patients.***

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INTRODUCTION

Drugs are important components of health care and play a crucial role in saving life. The limited information available on drug use throughout the world indicates that drugs are not optimally used. This inappropriate use has serious health and economic consequences for individuals, community and for the success of national health care systems [1].

The best way to investigate drug use in health facilities is usage of indicators created and validated by the World Health Organization (WHO) as they have proved to be both feasible to measure and informative as first line indicators during field testing in a number of developing countries. There are twelve core drug use indicators sorted into three groups: prescribing indicators (five), patient care indicators (five) and facility indicators (two). Prescribing indicators measure the performance of health care providers related to the appropriate use of drugs. The indicators are based on the practices observed in a sample of clinical encounters taking place at outpatient health facilities for the treatment of acute or chronic illness that can be observed retrospectively, from data recorded in historical medical records, or they can be observed prospectively. The core prescribing indicators measure general prescribing tendencies within a given setting, independent of specific diagnoses that do not require the collection of any information on signs and symptoms. WHO indicators for rational drug use cover the most important types of irrational prescribing: such as poly-pharmacy, over use of injections and antibiotics, and unnecessarily use of brand drug products [2, 3].

Although there may not exist objective norms to follow strictly either prescribing indicators or may vary according to local health condition there is an over all understanding in several developing countries as developed by the WHO. The WHO/International Networking for Rational Use of Drugs (INRUD) indicators showed the average number of drugs per prescription should be below two, less than 30% of prescriptions should include one or more antibiotics, less than 10% prescriptions should include one or more injections and percentage of drugs prescribed under generic name should be nearly 100%. If any of these core indicators give a higher value, there is likely to be a prescribing problem and further investigation is justified [4, 5].

Using multiple drugs per prescription in less developed countries with poor capabilities of monitoring of therapies and doses may yield devastating results. The higher the number of drugs per prescription, the higher would be the risk of unwanted effects. The average number of drugs per prescription is 1.59 in previous study conducted in Jimma Hospital and other studies conducted in different parts of Ethiopia show the values as in Hosana hospital 2.7, Attat hospital 2.6, Sodo hospital 2.4, Mizan hospital 2.0, Yirgalem hospital 1.7, Dilla hospital 2.0, Bahirdar hospital 1.80, and Debretabor hospital 2.2 which are nearly similar figures though higher scores were observed by Nigeria 3.8, Pakistan 3.5, and Indonesia 3.3 [6 - 9].

Antibiotic use has been effective in the treatment of infectious diseases, but the emergence of resistant bacteria is now becoming a great global concern. Patients in major hospitals staffed by highly competent personnel are dying as a result of infections by resistant strains of bacteria in developed and developing countries. Prescribing indicators in many developing countries showed that the percentage of prescriptions containing antibiotics ranged from 25 to 40% [10]. However, higher values were observed in Mizan hospital 64%, Hosana hospital 60%, and Dilla hospital 57% of southern Ethiopia and Debretabor hospital 64% of northwest Ethiopia, while in Jimma hospital, Gondar hospital and Bahirdar hospital exposure of patients to antibiotics indicated 33.1%, 36.9% and 41.9% respectively [6 - 8].

Where an immediate physiological action is needed the best route of administration of drugs is injection. However, use of injections is accompanied with a variety of disadvantages including the requirement of asepsis at administration, the risk of tissue toxicity from local irritation, the real or psychological pain factor and the difficulty in correcting the error. There is also a danger of transmitting infections like HIV/AIDS. On the other hand, most orally administered drugs have been proven equally effective, safer, and much cheaper. Indiscriminate use of injections especially in developing countries is therefore irrational. In 1990 in Uganda rates as high as 48% were registered, which were too high in the HIV/AIDS era [11]. Although studies conducted in different parts of Ethiopia indicated low injection exposures compared to Uganda's rate except that of Hosana hospital 43%; other reports are low as in Jimma hospital 20.2%, Mizan hospital 9%, Dilla hospital 22%, Sodo hospital 21%, Yirgalem hospital 21%, Attat hospital 9%, Debretabor hospital 24.5%, Gondar hospital 5.2%, and Bahirdar hospital 13.9% [6 - 8].

The existence of a number of brand products for a single medicine can significantly confuse health providers whereas it is more affordable, appropriate and safe to use generic products. The WHO indicators showed that use of generic products among countries varies from 37 to 94% [12]. The reports in different parts of the Ethiopia show percent generic in Mizan hospital 78%, Hosana hospital 77%, Dilla hospital 78%, Sodo hospital 82%, Attat hospital 62%, Bahirdar hospital 70.5%, Gondar hospital 72.6%, Debretabor hospital 84%, and Jimma hospital 75.2% [6 - 8].

Valuable information on core prescribing indicators can already be obtained from samples of as little as 30 prescriptions from one department, clinic, or pharmacy. Therefore, this study was done to explore the prescribing patterns so that the students, in particular medical interns and others who are in charge of prescribing, and practicing physicians would be aware of the problem and may find it a source of ideas pertaining to existing prescribing pattern and perhaps an incentive for change.

MATERIALS AND METHODS

This study was conducted in Jimma University Specialized Hospital (JUSH), Jimma, 345 Km southwest of Addis Ababa to assess drug prescribing patterns. The values of core prescribing indicators were measured retrospectively by collecting, reviewing and analyzing prescription records in outpatient pharmacy for the time period of March 2004 to May 2004. During data collection druggists in charge were briefed about the aim of the study and gave permission to assess previous patient prescriptions. A total of 660 general (adult and pediatric) prescriptions containing 1179 drugs were sorted out by druggists in charge under close supervision of the author by systematic random sampling and analyzed against core prescribing indicators.

The core prescribing indicators were defined in the following manner to avoid ambiguity during data collection, review and analysis.

Average number of drugs per encounter:
Purpose: To measure the degree of poly-pharmacy.
Prerequisite: Combination drugs are counted as one.

Calculation: The average was calculated by dividing the total number of different drug products prescribed by the number of encounters surveyed.

Percentage of encounters with antibiotic prescribed:

Purpose: To measure the overall use of this important and costly drug, but commonly overused.

Prerequisite: A list of the drug products that are to be counted as antibiotics was Prepared by referring to list of drugs for Ethiopia.

Calculation: Percentage was calculated by dividing the number of patient encounters during which an antibiotic was prescribed by the total number of encounters, multiplied by 100.

Percentage of encounters with an injection prescribed:

Purpose: To measure the overall use of this modality of treatment, but commonly overused and costly forms of therapy.

Prerequisite: All immunizations were excluded from the list of injections.

Calculation: Percentage was calculated by dividing the number of patient encounters during which an injection was prescribed by the total number of encounters, multiplied by 100.

Percentage of drugs prescribed by generic name:

Purpose: To measure the tendency to prescribe by generic name.

Prerequisite: Actual names used in the prescription rather than only having access to names of the products dispensed were used.

Calculation: Percentage was calculated by dividing the number of drugs prescribed by generic name by the total number of drugs prescribed, multiplied by 100.

RESULTS

In this study it was found out that the average number of drugs prescribed per encounter was 1.76 where 46.5% of the prescriptions contained only one drug and 34.5% of the prescriptions contained two drugs. Prescriptions containing three, four, five or six drugs were 14.1%, 3.78%, 0.75% and 0.3% of the total prescriptions respectively. The study revealed that multiple prescribing was encountered only in 19% of the prescriptions, calling for at least three drugs per prescription (Table 1).

The percentage of encounters with antibiotic prescribed was 25.6% while antipyretics/analgesics; psychotropic and narcotic substances; antacids and antiulcers; vitamins and minerals; anthelmintics; antifungals, antihypertensives, antiprotozoals, and diuretics accounted 18.7%, 17.2%, 7.9%, 7.4%, 5.8%, 5.1%, 3.9% 3.4%, and 2.8% respectively whereas 2.1% was for other therapeutic group of drug products (Table 2).

Table 1. Number of drugs prescribed to outpatients per prescription, JUSH, March 2004-May 2004.

Number of drugs per prescription	Frequency of prescriptions	Percent (%)
One drug only	307	46.5
Two drugs	228	34.5
Three drugs	93	14.1
Four drugs	25	3.78
Five drugs	5	0.75
Six drugs	2	0.35

Table 2. Highly prescribed therapeutic group of drug products, JUSH, March 2004-May 2004.

Therapeutic group of drug products	Frequency of prescription	Percent (%)
Antibiotics	302	25.6
Antipyretics/analgesics	220	18.7
Narcotic and psychotropic	203	17.2
Antacids anti-ulcer agents	93	7.9
Vitamins and minerals	87	7.4
Anthelmintics	69	5.8
Antifungals	60	5.1
Antihypertensives	47	3.9
Antiprotozoals	40	3.4
Diuretics	33	2.8
* Other therapeutic group of drug products	25	2.1

Corticosteroids, drugs for congestive cardiac failure, expectorants/antitusives…

The percentage of encounters with an injection prescribed was 2.9%, while encounters with orally administered solid unit dosage forms was 73.0% of the total drugs prescribed and 16.6% of drugs was in liquid dosage forms. Semisolid dosage forms and aerosols were 6.1% and 1.5%, respectively (Figure 1).

Percentage of drugs prescribed by generic name in this study was 87.1%, which is considerably higher than the majority of developing countries that varies from 37 to 94% [12], while 10.3% of drugs were prescribed by their brand names and 2.6% by unrecognized abbreviations (Figure 2).

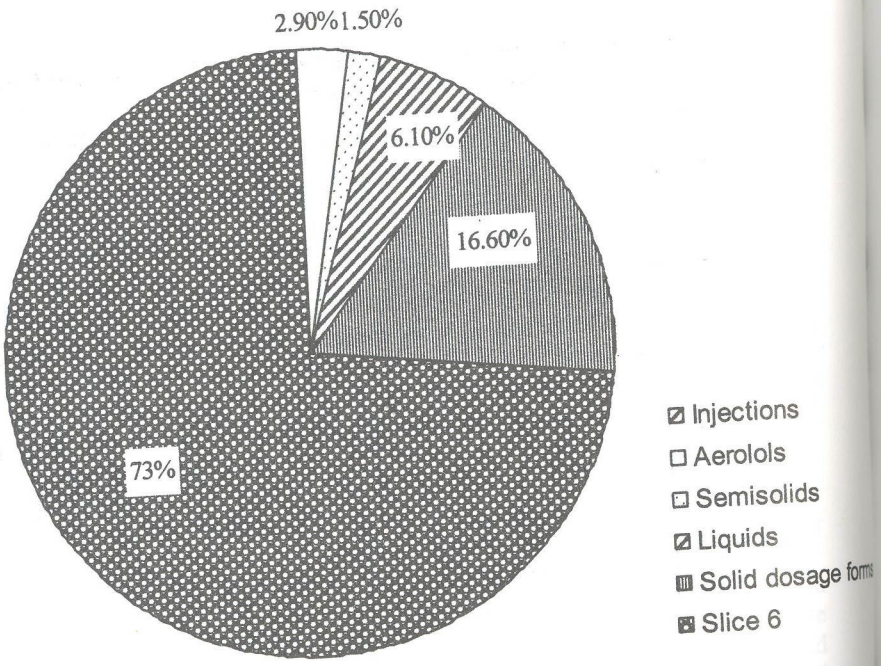

Figure 1. Percentage of encounters prescribed with different drug delivery systems, JUSH, March 2004-May 2004.

Solid unit dosage forms include tablets and capsules.
Liquids include all liquid dosage forms (for oral or topical use) including reconstituted powders as syrups, suspensions, elixirs.
Semisolids include ointments and creams.

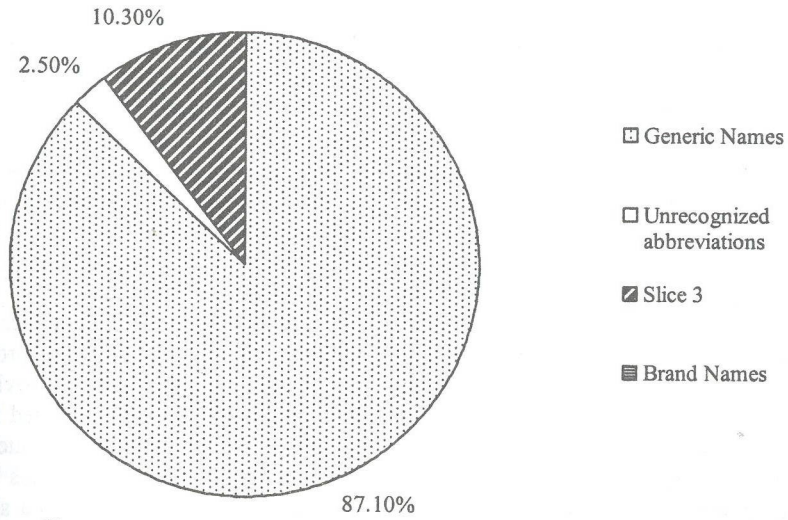

Figure 2. Percentage of drugs prescribed by generic names, brand names and unrecognized abbrevaitions, JUSH, March 2004-May 2004.

DISCUSSION

The most commonly used indicators in assessing rational drug use and prescribing practices of drugs are: average number of drugs per encounter, percentage of prescriptions of antibiotics and /or injections and generic prescribing. Numerous studies, both from developed and developing countries, describe a pattern consisting of polypharmacy, use of drugs that are not related to the diagnosis or unnecessarily expensive; irrational use of antibiotics and injections. Rational drug use in developing countries remains major problem. The main problems associated with drug use relate to irrational prescribing. Thus prescribing is assumed to be rational if the indicators have lower scores. Accordingly, the data collected, reviewed and analyzed against core prescribing indicators indicated that all values measured are not outlying as compared to literature values indicated elsewhere and were in agreement with suggested WHO criteria [2 - 5].

The analysis of drugs prescribed per encounter in this study gave an average of 1.76 drugs per encounter that was in agreement with the suggested WHO criteria [4, 5]. However, using the same WHO drug use indicators studies revealed the highest number of drugs prescribed per encounter from pediatric wards of Bahirdar Hospital 4.0, Gondar Hospital 3.2, and Debretabor Hospital 3.3 and in other studies conducted out of Ethiopia such as Nigeria 3.8, Pakistan 3.5, and Indonesia 3.3. In majority of developing countries this value ranges between 1.3 and 2.2. Two or more medications are usually prescribed when one or two would achieve virtually the same effect [9, 13]. However, this study revealed that 46.5% had one and 34.5% had two drugs only, while multiple prescribing was encountered only in 19% of the prescriptions, calling for at least three drugs per prescription. This could be attributed to necessity of the combination of drugs for treatment of some diseases or multiple infections.

The analysis of prescriptions revealed that antibiotics were the most widely prescribed drugs followed by antipyretics/analgesics and narcotics/psychotropic (Table 2). However,

the percentage of encounters with one or more antibiotics prescribed was lower compared to other studies with high values such as 64%, 60% and 57% in Mizan, Hossana, and Dilla hospitals of Southern Ethiopia, respectively [8]. The study conducted in Yemen suggested optimal theoretical value of 22.7%. Antibiotics are commonly used in developing countries due to the high prevalence of infectious agents and they are over prescribed and over used for self medication and for treatment of minor disorders. When antibiotics are used indiscriminately, bacteria become resistant to antibiotics and results in treatment failure when patients suffering form serious infections take antibiotics. Most countries tend to lie in the range of 25 to 40% containing at least one antibiotic, and even more in cases of patients admitted to hospitals [14, 15]. The present study showed 25.6% which is optimal value compared to standard and other reports from similar outpatients in Ethiopia and other countries. The higher values were observed in Mizan hospital 64%, Hosana hospital 60%, and Dilla hospital 57% of southern Ethiopia and Debretabor hospital 64% of northwest Ethiopia, while in Jimma hospital, Gondar hospital and Bahirdar hospital exposure of patients to antibiotics indicated 33.1%, 36.9% and 41.9% respectively [6 – 8, 16 - 20]. Therefore, in this particular study, it would not require an intervention strategy but further follow up as antibiotics were used almost in a rational way.

The percentage of encounters with injection prescribed was lower than optimal theoretical values proposed in Yemen study that is 17.2%. High percentage of administering injections was observed in Hossana hospital 43%, Dilla hospital 22%, Sodo hospital 21% and Yirgalem hospital 21% [8, 14]. Therefore the use of injections in this study was lower compared to other studies unless otherwise it is affected by the availability of injectable drugs, syringes, and needles. This indicates that the health providers in JUSH are aware of the need to restrict injection use. Low percentage of injection prescribed is advisable particularly in the HIV/AIDS era and moreover, the repeated use of syringes and needles carries the risk of abscess formation and transmission of fetal infection [11].

The existence of a number of brand products for a single drug product can significantly confuse health providers. The use of generic prescribing varied from 37% to 94% in the studies conducted in a number of developing countries [12]. The 1995 national survey in Eritrea showed an over all rate of 79% generic drug use [21]. The average of 87.1% found in the present study is not as expected to the standard [4]. Therefore, the need for prescriptions strictly adopted to generic prescribing should be checked to rectify the problem. People in many countries rely on brand names and expensive drug products as they associate quality with the cost. Certain assessment studies have indicated that the majority of the misuse is associated with irrational prescribing and dispensing [12, 14, 20, 22].

CONCLUSION

The average number of drugs prescribed per encounter was within the optimal value as suggested WHO criteria. A decreasing tendency of prescribing injection and antibiotics and an increasing habit of prescribing by generic names as reported in this study could reflect a rational drug prescribing pattern that need to be encouraged compared to values reported form similar studies conducted in some regions of Ethiopia and African countries. Though this study revealed that there were encouraging practices and good indications of rational prescribing, it would not be rational to conclude as only records of 3 months are collected and analyzed.

RECOMMENDATION

Based on the studies I recommend larger and more comprehensive studies at regular intervals preferably over one year period to control for seasonal variations and for the development of workable interventions targeting the identified areas to improve drug management systems in the hospital. Moreover, the survey was only for outpatient prescriptions, and hence the study has to include for inpatients at regular intervals.

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