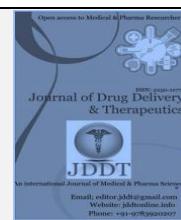


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Research Article

## Drug use pattern using WHO prescribing indicators at Sheikh Sultan Hassan Yabere Referral Hospital, Eastern Ethiopia: A cross sectional study

Muktar Shekabdulahi Warsame

Jigjiga University, College of Medicine and Health Sciences, Department of Public Health, Ethiopia

### ABSTRACT

**Introduction:** In order to enhance rational drug use, it is very important to assess the prescribing pattern of the facilities using standard prescribing checklists. Hence, the aim of this study was to assess drug use pattern using WHO prescribing indicators at Sheikh Hassan Sultan Yabere Referral Hospital, Eastern Ethiopia.

**Objective:** the objective of this study is to assess drug use pattern using WHO prescribing indicators at Sheikh Hassan Sultan Yabere Referral Hospital, Eastern Ethiopia 2019

**Method:** Retrospective study design was employed to assess the current drug prescribing pattern of Sheikh Hassan Sultan Yabere Referral Hospital. Six Month prescription papers from December 1, 2018 to May 31, 2019 were surveyed. A total of 600 prescriptions that were selected using systematic random sampling were reviewed. Data was collected from prescriptions at outpatient pharmacy. The data was entered to excel and analyzed and presented with tables and charts.

**Results:** The average number of drugs prescribed per encounter or mean was 1.98 with a range between one and six drugs. The percentage of encounters in which an antibiotic or injection prescribed were 60 % (n=600) and 2.5 % (n=600) respectively. The percentage of drugs prescribed by generic name and from an essential drug list were 89.5 % (n=600) and 98.99% (n=600). The commonly prescribed forms of antibiotics were Amoxicillin (19.15%), Amoxicillin/Clavulunate (17.41) and Azithromycin (16.83%). The most commonly prescribed injection was Ceftriaxone (52.14%).

**Conclusion:** This study revealed major deviation from standard WHO recommended rational prescribing practice with regard to antibiotic use. The study also showed deviation from WHO standard with regard to use of generic name and prescribing from national formulary/Essential drug list.

**Keywords:** Rational drug use, prescribing pattern, WHO prescribing indicators Jigjiga, Somali Region.

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### \*Address for Correspondence:

Muktar Shekabdulahi Warsame, Jigjiga University, College of Medicine and Health Sciences, Department of Public Health, Ethiopia.  
 Email: muktarshek66@yahoo.com

### INTRODUCTION:

Medicines play an indispensable role in health care delivery and prevention of disease and are major component of patient management in health care. The availability and affordability of good quality medicines along with their rational use is vital for effective health care. To promote rational drug use, it is important to assess drug use pattern using World Health Organization (WHO) drug use indicators<sup>1</sup>.

According to World Health Organization (WHO) half of the medicines are prescribed and dispensed improperly. Hence, half of patients take them inappropriately<sup>2</sup>.

Essential drugs are those that satisfy the health needs of the majority of the population with a cost which is affordable to the community. These drugs should be present at all times in an adequate amount and dosage form<sup>3</sup>

A study conducted in 8 hospitals in southern Ethiopia on prescribing pattern revealed irrational prescribing of drugs which include high average number of drugs for patients, high presence of antibiotics and injections<sup>4</sup>.

According to study conducted at Ayder Referral hospital the average number of drugs per prescription was 1.67 with a range of one to six. Generic prescribing and drug use from national formulary were 86.6% and 94% respectively. The percentage antibiotics and injection use was found to be

32.9% and 41.9% respectively<sup>1</sup>. Due to the rising prevalence of antibiotic resistance globally, inappropriate antibiotic use is of international concern, and countries struggle to implement basic policies promoting rational antibiotic use<sup>5</sup>.

A study conducted in Nepal Katamandu medical college teaching hospital showed poly pharmacy (Average no. of prescription per encounter was 5.8) and commonly used brand names for prescribing of the drugs<sup>6</sup>

This study assessed the drug prescribing pattern in outpatient pharmacy of Jigjiga University, Sheikh Sultan Hassan Yabere Referral Hospital by using WHO prescribing indicator use.

## METHOD

### Study setting

Jigjiga University, Sheikh Sultan Hassan Yabere Referral Hospital is found in capital city of Somali region, Jigjiga which is located 610 KM east of Addis Ababa capital of Ethiopia. This is the only referral hospital in the region and serves more than five million populations as a referral point including the neighboring countries like Somalia.

### Study design

A retrospective cross sectional study design was employed on outpatient prescription for the period of December 2018-May 2019.

### Data collection and analysis.

A total of 600 prescriptions which is minimum standard to study prescribing pattern according to WHO were included in the study. Data collection tools were adopted from WHO prescribing indicators. The specific types of data necessary to measure the prescribing indicators were recorded for each patient encounter which includes information such as age, sex, diagnosis, drug prescribed, injections, Antibiotics and category of the drug.

Prescriptions containing drugs which are not readable and those which contain medical supplies were excluded from the study.

### Prescribing indicators

The prescribing indicators that were measured included:

1. The average number of drugs prescribed per encounter: This measures the rational drug use from poly pharmacy perspective and is calculated by dividing the total number of different drugs prescribed by the number of prescription encounters surveyed. Two or more drugs that are prescribed for a given health condition (e.g. Helicobacter induced pylori) is counted as one.

2. Percentage of drug prescribed by generic name: Measures the tendency of prescribing by generic name and is calculated by dividing the number of drugs prescribed by generic name by total number of drugs prescribed multiplied by 100.

3. Percentage of encounters in which an antibiotic was prescribed: measures appropriate utilization of antibiotics in

treating the diseases. This is calculated by dividing the number of patient encounters in which antibiotic was prescribed by the total number of encounters multiplied by 100.

4. Percentage of encounters with an injection prescribed is calculated to measure overuse of injections and calculated by dividing the number of patient encounter in which an injection was prescribed by the total number of encounters surveyed multiplied by 100.

5. The percentage of drugs prescribed from an essential drug list (EDL) is calculated to measure the degree to which practices confront to a national drug policy as indicated in the national drug list of Ethiopia. It is calculated by dividing number of products prescribed which are in essential drug list by the total number of drugs prescribed multiplied by 100.

**Inclusion:** Encounters that took place from December 2018 to May 2019 were included and referrals and vaccinations were excluded from the study.

### Operational definitions

**Generic drugs:** International (non-proprietary) name which is agreed by international commission. The essential drug list of Ethiopia is used as a basis to determine drugs as generic or brand name.

**Antibiotics:** are produced by microorganisms (Fungi, Bacteria) and are directly used against another microorganism at phylogenetic level. In this study drugs such as penicillin, antibacterial, anti-infective dermatological and anti-infective ophthalmic agents are examples of antibiotics.

### Ethical consideration

Ethical approval was obtained from Jigjiga University College of medicine and Health Science and permission was obtained from the hospital to undergo the study. In addition, patients' document were kept appropriately and confidentially

## RESULTS

### Completeness of prescription

A total of 600 prescriptions were reviewed from Dec 2018-May 2019 in this hospital. 414 (69%) and 544 (90.67) of the prescriptions contained the date and age of the patients but only 9 (1.5%) and 41 (6.83) of the prescriptions contained patient weight and address respectively. The diagnosis was also written only for 49 (8.17%) of the patients.

Most drugs were prescribed from Essential drug list of Ethiopia 1178 (98.99%) and were mainly prescribed using generic name of drugs 1065 (89.5%).

Concerning the prescribing indicators, the average number of drugs per encounter was 1.98. Sixty percent (60%) of the encounters contained one or more antibiotics and only 2.5% of encounters contained injections. Majority of the drugs (89.5%) were prescribed using generic name which is recommended nationally and almost all (98.99%) were from the national drug list. (Table 1. Summarizes the main prescribing indicators).

**Table 1: Result of prescribing indicators at Jigjiga University Shiekh Sultan Hassan Yabere Referral Hospital, Somali Region, Jigjiga June 2019.**

| S.no. | Prescribing indicators assessed                | Total drugs/encounters | Average/Percentage (%) | Standard (Ideal) |
|-------|--|------------------------|------------------------|------------------|
| 1.    | Average no. of drugs per encounter             | 1190                   | 1.98                   | 1.6-1.8          |
| 2.    | Percentage of encounter with antibiotics       | 360                    | 60                     | 20-26.8%         |
| 3.    | Percentage of encounters with injections       | 15                     | 2.5                    | 13.4-24.1        |
| 4.    | Percentage of drugs prescribed by generic name | 1065                   | 89.5                   | 100%             |
| 5.    | Percentage of drugs from the national list     | 1178                   | 98.99                  | 100%             |

The most commonly prescribed antibiotics were amoxicillin 99 (19.15%) followed by Amoxicillin+Clavulunate 90 (17.14%) and Azithromycin 87 (16.83%) respectively. (Table 2 shows summary of this)

**Table 2: Result of most commonly prescribed antibiotics at Jigjiga University Shiekh Sultan Hassan Yabere Referral Hospital, Somali Region, Jigjiga, June 2019.**

| S.no. | Name Antibiotics  | Frequency (N=517) | Percentage (%) |
|-------|---|-------------------|----------------|
| 1.    | Amoxicillin   | 99                | 19.15%         |
| 2.    | Amoxicillin/Clavulunate   | 90                | 17.41%         |
| 3.    | Azithromycin  | 87                | 16.83%         |
| 4.    | Metronidazole   | 68                | 13.15%         |
| 5.    | Ciprofloxacin   | 58                | 11.22%         |
| 6.    | Cephalexin  | 28                | 5.42%          |
| 7.    | Doxycycline   | 20                | 3.87%          |
| 8.    | Cloxacillin   | 22                | 4.26%          |
| 9.    | Norfloxacin   | 13                | 2.51%          |
| 10.   | Others (Ceftriaxone, Cotrimoxazole, Erythromycin, Ampicillin, Clarithromycin, Cefixime, Benzathin pen.) | 32                | 6.2%           |

The most commonly prescribed injection in this referral hospital was ceftriaxone (11.76% as shown in table 3)

**Table 3: Result of most commonly Prescribed Injections at Jigjiga University Shiekh Sultan Hassan Yabere Referral Hospital, Somali Region, Jigjiga June 2019.**

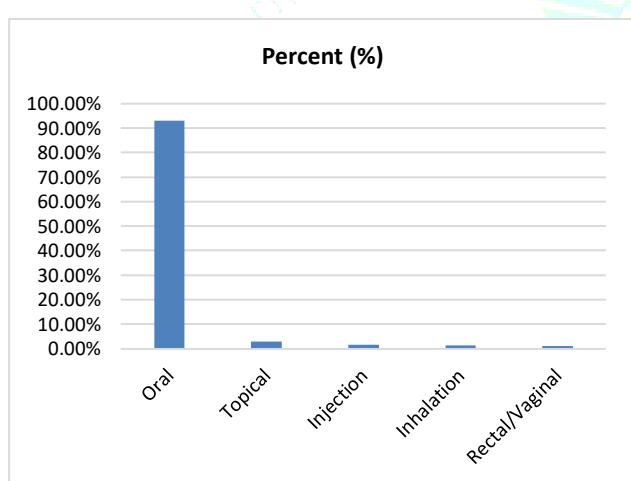
| S.no. | Name of injection   | Total | %       |
|-------|---------------------|-------|---------|
| 1     | Ceftriaxone         | 9     | 52.94%  |
| 2     | Diclofenac          | 2     | 11.76%  |
| 3     | Procaine penicillin | 2     | 11.76%  |
| 4     | Cimetidine          | 1     | 5.88%   |
| 5     | Metocloperamide     | 1     | 5.88%   |
| 6     | Benzatin penc.      | 1     | 5.88%   |
| 7     | Hydrocortisone      | 1     | 5.88%   |
|       | Total               | 17    | 100.00% |

Among the drugs prescribed, the most commonly prescribed categories of drugs were antibiotics 476 (41.11%) followed by Anti-inflammatory and Cardiovascular drugs

**Table 4: Result of Prescribed category of drugs at Jigjiga University Shiekh Sultan Hassan Yabere Referral Hospital, Somali Region, Jigjiga June 2019.**

| S.no. | Category of drugs                     | Total | N=1158 |
|-------|---------------------------------------|-------|--------|
| 1.    | Antibiotics                           | 476   | 41.11% |
| 2.    | GI drugs                              | 86    | 7.43%  |
| 3.    | CV & Kidney drugs                     | 94    | 8.12%  |
| 4.    | Antiprtozoals                         | 21    | 1.81%  |
| 5.    | Antihelmints                          | 19    | 1.64%  |
| 6.    | Antipians & Antirhematics             | 245   | 21.16% |
| 7.    | Anti-Asthma & Other respiratory drugs | 48    | 4.15%  |
| 8.    | Vitamins & Minerals                   | 93    | 8.03%  |
| 9.    | Antidiabetic & Endocrine drugs        | 20    | 1.73%  |
| 10.   | NS drugs & Anesthetics                | 26    | 2.25%  |
| 11.   | Antifungals                           | 14    | 1.21%  |
| 12.   | Ophthalmic agents                     | 10    | 0.86%  |
| 13.   | Anticogulants                         | 2     | 0.17%  |
| 14.   | Antiviral                             | 4     | 0.35%  |
|       | Total                                 | 1158  | 100%   |

Most drugs were prescribed by oral route of drug administration and followed by topical route.



**Figure 1: Commonly prescribed route of drug administration at Jigjiga University Shiekh Sultan Hassan Yabere Referral Hospital, Somali Region, Jigjiga June 2019.**

## DISCUSSION

In this study the average number of drugs per prescription was 1.98 which is not far from the standard (1.6-1.8) & is similar with similar study conducted at Hawassa University Refferal hospital but is lower than study conducted in selected hospitals in eastern Ethiopia which was 2.2 <sup>7, 8</sup>. Study conducted at South west Ethiopia in Jimma hospital showed average prescriptions per encounter of 1.59 But, in another study at Northern Ethiopia on three hospitals the average prescriptions per encounter were 0.98 at Gonder, 1.8 at Bahirdar and 2.2 at Debre Tabor hospital respectively <sup>9, 10</sup>.

Study conducted at Jordan on five hospitals reveled 2.93 drugs per prescription and another study at Nigeria on

hospitalized children showed an average encounter of 2.1 drugs per prescription <sup>11, 12</sup>.

Other study conducted on 209 patients at South India pediatric population showed the average number of drugs per prescription of 4.56 and in Pakistan it was 2.8 <sup>13, 14</sup>.

In this study Sixty percent (60%) of the encounters contained one or more antibiotics which is comparable with study at Hawassa University Hospital (58%) and very high compared to the standards<sup>8</sup>. This should be given emphasis and regulated for better patient outcome. A higher percentage of encounters in the use of antibiotics (exceeding proposed reference values) may potentially be signifying an indiscriminate use of antibiotics. While a high antibiotic use may highlight increased rate of local infections, it may be a sign of prescriber's inexperience or a weak local health system characterized by a lack of diagnostic facilities such as microscopes that often lead to presumptive treatment of cases

In this study, only 2.5 % of encounters contained injections which is lower than the standard as well as that of Hawassa University Hospital study(38.1%) and study conducted in selected health facilities in eastern Ethiopia which was 11.3% <sup>7, 8</sup>

Most commonly prescribed antibiotics was similar with Hawassa University hospital study (i.e. amoxicillin, 19.15%,) followed by amoxicillin+clavulunate (17.41%) and azithromycin (16.87%)<sup>8</sup>.

The proportion of medicines prescribed by generic name was 89.5% and about 99% of drugs were prescribed from essential drug list of Ethiopia. In study conducted in selected hospitals in Eastern Ethiopia % by generic name and from essential drug list (EDL) were 97% and 92 % respectively<sup>7</sup>. In other study conducted at the Hawassa University Hospital the % prescribed by generic name was 98.7% and 96.6% were from the essential drug list of Ethiopia but in the study

conducted in Northern Nigeria only 66.8% of the drugs were written with generic names and 95.5% of the drugs were prescribed from the Essential medicine list<sup>8,12</sup>.

In other study conducted in Jordan and India prescribing from the essential drug list was 57.6% and 49.78% respectively. In addition the drugs prescribed by generic name was found to be only 19.16% in the Indian study<sup>11,15</sup>.

Percentage of medicines prescribed generically as well as from EML highlights conformity to lay down prescribing regulations and prevailing medicines situation. For instance, a low percentage of generic medications prescribed may signal unavailability of cost-effective generic medicines because of potency issues, prescriber's lack of confidence in generic medicines and/or patients preference for branded products.

In this study, the most commonly prescribed antibiotics were amoxicillin 99 (19.15%) followed by Amoxicillin+Clavulunate 90 (17.14%) and Azithromycin 87 (16.83%) respectively. And the most commonly prescribed injection in this referral hospital was ceftriaxone (11.76%). This was similar to study conducted in Jordan where amoxicillin was most commonly prescribed antibiotics. In study conducted in Nigeria the most commonly used choice of antibiotic were ampicillin/cloxacillin combination<sup>11,12</sup>.

In this study antibiotics were the most commonly prescribed category of drugs and most drugs were prescribed by oral route of drug administration and followed by topical route. This was similar to study conducted in Arba minch General hospital and Chenka hospital and Tamil Nadu<sup>13,16</sup>.

### Limitations of this study

The WHO prescribing indicators were used in this study which records exactly what was prescribed to the patients, but not why which may need further study. They are designed for use in health centers, dispensaries or hospital outpatient departments and are less useful in referral hospitals where the drug use pattern is more complex.

### CONCLUSION

In this study there was no deviation from standard of prescription per encounter which assesses the presence of poly pharmacy in the facility but observed major deviation (overuse) from standard WHO recommended rational prescribing practice with regard to antibiotic use which may need an intervention. Drug use evaluation on whether these antibiotics prescribed correctly or not should be done.

The study also showed deviation from WHO standard with regard to use of generic name and prescribing from national formulary/Essential drug list.

Baseline from this study can be used by researchers and policy makers to improve prescribing practice at this referral hospital.

### Recommendations

Based on the findings of this study the following recommendations are forwarded

➤ The Referral hospital should take measures for correcting deviation from the standard with regard to antibiotics and injections through different means

- The health workers should be adhering to the standard in their prescribing using generic drugs and awareness on this should be provided to the health workers
- Further study should also be done to dig out factors contributing irrational drug uses.

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### Competing Interests

There is no financial or personal relationship(s) which may have inappropriately influenced me in writing this article.

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