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### Original Article

## Evaluation of Prescription Pattern and Rational Prescribing in Eastern Nepal

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### ABSTRACT

#### Background

To promote rational prescribing and appropriate use of drugs, it is important to evaluate the prescription pattern using the World Health Organization (WHO) drug use indicators. The aim of this study was to evaluate the prescription patterns and rational prescribing at the private community pharmacies of Biratnagar, Eastern Nepal, using some of the WHO core drug use indicators.

#### Material and Methods

Five private community pharmacies were selected using systemic random sampling. Nine hundred patient encounters from these pharmacies were assessed prospectively for four months from September 2015–December 2015. Data was collected from each patient encounter and were recorded directly into a prescription indicator form.

#### Results

Average number of drugs prescribed per encounter was 2.14 (n=1930). Percentage of drugs prescribed by generic name and from essential drug list was 45.18% (n=872) and 76.11% (n=1469) respectively. Percentage of encounters in which antibiotic and injection was prescribed were 40.44% (n=364) and 3.44% (n=31) respectively.

#### Conclusion

Prescribing practices in Eastern Nepal are not up to the standards recommended by WHO. Drug use evaluation can help to ensure whether the antibiotics are appropriately prescribed or not. Poly-pharmacy, excessive use of antibiotics was quite common and concept of generic prescribing and National Essential Medicine List (NEML) was not appreciable. Standard guidelines should be recommended and strictly followed by the prescribers and National Formulary and NEML should be made available in every health institution. Physicians should be emphasized to prescribe medicines from NEML.

**Key Words:** *Drug use indicators, Prescription pattern, Rational prescribing*

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#### Introduction

Quality of health and medical care amongst the patients and the community is determined by the rational prescribing and appropriate use of drugs [1]. Study in Nepal has revealed excessive use of

antibiotics, prescribing of large number of drugs and injections are common drug use problems [2]. World Health Organization/ International Network for Rational Use of Drugs (WHO/ INRUD) have forwarded indicators as measures of performance in

general areas related to rational use of drugs. WHO states that 100% of the medicines must be prescribed from the Essential Medicine List of any country [3]. Studies conducted in Nepal show that essential medicines are widely prescribed more in health facilities than in private practice. DDA's study on 'Drug Prescribing habits in Private Practice in Kathmandu Municipality area' shows drugs prescribed from EML is 32.4% and at Zonal hospital is 42% [4]. For the effective promotion of rational drug use in developing country it is essential to assess the compliance of drug use pattern with WHO drugs indicators [5]. So, knowing where and when errors in rational prescribing are most likely to occur is the first step in trying to prevent these errors.

This study was conducted to assess drug use pattern in Eastern Nepal using WHO Prescribing Indicators so as to promote rational use of drugs. Considering the vital role of appropriate formal prescriptions in medical practice, and for better health care delivery system, this study is conducted to create awareness of rational use of drugs, prescribing drugs from essential medicine list. This can be achieved by assessing the prescription patterns of different private community pharmacies with the standard WHO prescribing indicators. Thus the result of this study proves to be useful for the prescribers to understand the importance and need of emphasizing on the adherence to the standard WHO prescription format.

#### Material and Methods

Five private community pharmacies of Biratnagar were selected using systemic random sampling method. Ethical approval from the Institutional Review Community was taken. Prescriptions of ambulatory adult patients of all categories of diseases and age group were analyzed from September 2015 to December 2015. Prescription of patients visiting for follow up or prescriptions of patients at the time

of discharge were not taken into consideration. With reference to WHO Core Prescribing Indicators, data needed to measure the prescribing pattern was collected and recorded for each patient encounter and entered directly into a prescribing indicator form. Essential Medicines WHO Model list (2015) and National List of Essential Drugs, Nepal (2011) were used to find the percentage of drugs from essential drug lists.

The WHO Prescribing indicators were measured included:

1. Average number of drugs per encounter.
2. Percentage of drugs prescribed by generic name
3. Percentage of encounters with antibiotic(s) prescribed.
4. Percentage of encounters with injection(s) prescribed.
5. Percentage of drugs prescribed from an essential medicine list (EML).

#### Results

Nine hundred prescriptions were evaluated from the private community pharmacies of Biratnagar, Nepal. Most prescriptions were for females (68.55%), with a mean age of 33.3 years. Total of 1930 drugs were prescribed. Average number of drugs prescribed per prescription was 2.14. Total number of drugs prescribed by generic name was 872 (45.18%). An antibiotic was prescribed in 364 patient encounters (40.44%) Most of the drugs prescribed (n = 1469, 76.11%) were on the essential list of Nepal (Table1).

**Table 1: Results obtained at private community pharmacies of Biratnagar.**

Prescribing indicators	Total drugs / encounters	Average / percent
Average number of drugs per encounter	1930	2.14
Percentage of drugs prescribed by generic name	872	45.18
Percentage of	364	40.44

encounters with an antibiotic prescribed		
Percentage of encounters with an injection prescribed	31	3.44
Percentage of drugs prescribed from essential drug list	1469	76.11

Of total 1930 drugs prescribed, 831 (43.05%) were antibiotics. The most commonly prescribed antibiotics were cefixime (19.61%), amoxicillin (19.13%), azithromycin (14.07%), ciprofloxacin (11.55%), cloxacillin (10.46%). (Table 2)

**Table 2: Commonly prescribed antibiotics at the private community pharmacies of Biratnagar.**

Commonly prescribed antibiotics	Frequency	Percentage (%)
Cefixime	163	19.61
Amoxicillin	159	19.13
Azithromycin	117	14.07
Ciprofloxacin	96	11.55
Cloxacillin	87	10.46
Ampicillin	45	5.41
Metronidazole	44	5.29
Ofloxacin	37	4.45
Gentamycin	21	2.52
Cefadroxil	20	2.40
Cefalexin	16	1.92
Nitrofurantoin	12	1.44
Ceftriaxone	9	1.08
Levofloxacin	5	0.60
Total	831	99.93

The percentage of encounters in which an injection was prescribed was 3.44%. The most commonly prescribed injections were ceftriaxone (29.03%), diclofenac sodium (25.8%), tetanus toxoid (19.35%), multivitamin (9.67%) (Table 3).

**Table 3: Commonly prescribed injections at the private community pharmacies of Biratnagar.**

Commonly prescribed injection	Frequency	Percentage (%)
Ceftriaxone	9	29.03
Diclofenac	8	25.8
Tetanus toxoid	6	19.35
Multivitamin	3	9.67
Dexamethasone	3	9.67
Metronidazole	2	6.45
Total	31	99.97

## Discussion

Irrational use of drug occurs in all countries and cause harm to people [6]. In this study, WHO/INRUD drug use indicators were basically used to assess the current prescribing pattern so as to facilitate the rational use of medicine in populations.

This study shows the average number of drugs per encounter was 2.14 (Table 1). The average number of drugs per encounter recommended by WHO is 1.6 to 1.8 [7]. In similar study conducted in PHC facilities of Kathmandu the average number of drugs per prescription was 1.5 [8]. The average in this study deviates the standard provided by World Health Organization and exceeds that of PHC facilities as well. This can be due to the tendency of prescribing more drugs by the prescribers in private practices due to various reasons. This can lead to poly-pharmacy, increased risk of drug interaction, non-compliance and irrational drug use.

WHO recommends 100% of drugs to be prescribed generically [7]. This study shows the percentage of medicines prescribed generically is 45.18 (Table 2) which goes hand in hand with the results of the study (44%) conducted in PHC facilities of Kathmandu [8]. In some of the developing countries, this value was > 59% [9, 10]. Study conducted in the Western Nepal revealed it to be 63.5% [11]. Thus, it is found that effective implementation of the existing policy of generic prescribing is not satisfactory in Eastern Nepal. This can lead to increased cost of drugs, chances of generic duplication leading to the adverse effect and drug related toxicity, and unethical marketing by some industries.

Thus, the policy on generic prescribing in Nepal has to be strictly followed by the prescribers. The prescribers should remain adherent to the national guidelines and the WHO guidelines on rational prescribing of drugs.

WHO recommends percentage of encounters with antibiotic prescribed should be 20.0% to 26.8% [7]. In this study, the percentage is 40.44% (Table 1) and accounts for 43.05% of total drugs prescribed. Although it is consistent with the 43% of encounters revealed from the study conducted in the PHC facilities of Kathmandu [8] the average is between 29% and 43% in developing countries. In Nepal, 52.4% of patients received at least one antibiotic in terai districts whereas the percentage was 45.2% in hilly districts [2]. PHC is usually provided by the government through national health care systems whereas private health care can be provided through for profit hospitals and self employed practitioners. This can be the reason of increased percentage of antibiotics prescribed in this study.

Although the WHO standards for encounters with injection are 13.4 – 24.41% [7], this study revealed it to be 3.44%. Previous study in Nepal revealed 8.8 percent of encounters in terai region and 3.2 percent in hilly region received injections [2,4], in PHC facilities of Kathmandu it was 5% [8]. Percentage of encounter with an injection prescribed is better if it is as low as possible because of the risk of communicating diseases and the increased use of health care resources. The current trend of prescribing limited number of injections should be continued and should not be higher than the standard limits.

WHO states 100 percent of drugs should be prescribed from Essential Medicine List of any country [7], but in this study only 76.11% of drugs are prescribed from EML, 2015. In previous study 75.6 percent of drugs were prescribed from the EML [9]. There is need to increase the number of medicine prescribed as per EML so as to match the WHO standards. The prescribers should remain updated about the WHO Model List of EML of the country so as to

follow the standards and to avoid the chances of irrational use of drugs, poly-pharmacy and thus achieve better health care delivery.

Our study had a number of limitations. The study could not cover all the health facilities and could not reveal the exact reason that led to poly pharmacy, excessive use of antibiotics and less adherence to the NEML.

### **Conclusions**

The percentage of encounters with injection prescribed was lower than that reported elsewhere. This is to be encouraged. Other prescribing practice is not up to the standards recommended by WHO. Irrational practice of prescribing the drugs is common. Poor compliance of physicians with WHO Core Prescribing Indicators may lead to undesired drug effects, toxicities, tolerances and resistances. Excessive use of antibiotic is common and the trend of prescribing medicines from NEML is not up to the mark. Further studies for a longer period of time in a greater number of pharmacies, health facilities are required.

Regular workshops, seminars, training should be encouraged by the regulatory agencies to promote the value of core prescribing indicators of WHO. Standard guidelines should be recommended and strictly followed by the prescribers and National Formulary and NEML should be made available in every health institution. Physicians should be emphasized to prescribe medicines from NEML.

Thus, standard prescribing pattern and compliance with WHO Core Prescribing Indicators can be guaranteed and rational prescribing can be promoted.

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