A FOLLOW-UP STUDY ON RATIONAL DRUG PRESCRIBING AND DISPENSING IN OUTPATIENTS IN A TERTIARY CARE TEACHING HOSPITAL OF WESTERN NEPAL

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Summary

Previous studies have acknowledged that irrational use of medicines is a problem in Nepal. Studies from the Manipal Teaching Hospital have identified lacunae in prescribing and recommended interventions to improve the drug use pattern in the hospital. Educational and managerial interventions have been carried out to improve the use of medicines.
The study was conducted with the objectives of analyzing the prescriptions for rational prescribing and dispensing, and to evaluate the patient's knowledge regarding use of drugs as per the International Network for Rational Use of Drugs (INRUD)/WHO indicators.
The prescription and labeling of the dispensed drugs were checked for their accuracy and necessary details were entered in the encounter form developed as per the INRUD/WHO indicators. Patients were interviewed for their knowledge regarding dose, duration, and frequency of the drug prescribed. The filled encounter forms were analyzed for the results. The average drugs per prescription were 2.53. Only 16.38% of drugs were prescribed by generic name and 18.08% of the total drugs were fixed-dose combinations. It was found that only 37.09% and 31.06% of the drugs prescribed were from the Essential drug list of Nepal and WHO Essential drug list respectively. A very high percentage (97.92%) of the drugs was prescribed from the hospital drug list and 47.75% of the drugs were from the Nepalese National Formulary. The average cost per prescription was found to be NRs. 224.83 (USD 3.10). It was found that all of the medication envelopes were labeled with name of the drug and time of administration. All the patients knew the duration of the therapy and time of administration time of drugs.
The study reported an improvement in the drug use at Manipal Teaching Hospital. There was also a reduction in the prescription cost and improvement in patient knowledge regarding the medications. However, larger studies covering more patients are needed.

Keywords: Dispensing, Intervention, Rational prescribing.

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Introduction

Irrational use of medicines is a common problem worldwide. In Nepal, several studies have acknowledged the problem of irrational use of medicines.[1-5] The reasons for irrational use are varied, comprising of non-availability of medicines, self-medication, irrational prescribing by the health care professionals, lack of drug information etc. The drug use situation is further worsened by the unethical promotional strategies by the pharmaceutical companies.[6] The outcome of irrational use of medicines includes economic loss, development of adverse drug reactions (ADRs), development of antimicrobial resistance etc.

Drug utilization research defined as 'the marketing, distribution, prescription and use of drugs in a society with special emphasis on the resulting medical, social and economic consequences[7] is one of the approaches for studying medicine use. In Nepal, previous studies had recommended several strategies to improve the drug use situation.[4,8,9] At the Manipal Teaching Hospital (MTH), a tertiary care teaching hospital in Western Nepal, previous studies have documented several shortcomings in medicine use. Some of the important problems included use of combination of Ampicillin+Cloxacillin, [10] brand name prescribing, increased use of intravenous antibiotics, use of antibiotics in viral infections etc. [11]

A study from the MTH conducted as per the INRUD/WHO indicators recommended the need for educational interventions for prescribers to improve prescribing and both managerial and educational interventions for the hospital pharmacists for improving dispensing.[12] Following this study, several educational and managerial interventions were carried out in order to improve the drug use pattern. The educational interventions included providing drug information to the clinicians by the drug information center (DIC) staff, conducting continuing pharmacy education (CPE) program for the pharmacists etc. The managerial interventions included development of a hospital drug list, revitalization of the hospital Drug and Therapeutics Committee (DTC), restriction of the use of irrational combinations etc. The impact of these interventions was not yet studied. Hence the present study was carried out.

Objectives: The study was conducted with the following objectives.
1. To analyze the prescriptions for rational prescribing and dispensing based on WHO/INRUD indicators
2. To evaluate the patient's knowledge regarding use of drugs as per WHO/INRUD indicators.

Study tool: The INRUD encounter form (Appendix-1) was used for the study.

Study duration: The study was carried out during the time period from 21 June to 3 September 2006.

Inclusion and exclusion criteria: Patients were randomly selected for the study. In case of pediatric and psychiatric patients, the patient attendant was interviewed.

Data collection: The patients and their prescriptions were used as data source. The prescription and labeling of the dispensed drugs were checked for their accuracy and all the relevant data were entered in the encounter form. The patients were also interviewed for their knowledge regarding dose, duration, and frequency of the drugs dispensed.

Analysis: The filled encounter form (Appendix 1) was analyzed as per the study objectives. The details were entered in Microsoft excel and analyzed for parameters like age distribution of the patients, number of drugs per prescription, department wise categorization of prescriptions, average number of drugs per prescription, therapeutic category of drugs prescribed, encounters with an antibiotic prescribed, prescription cost, dosage form, prescribing indicators, labeling of the medicine envelop and patient knowledge.

Results

A total of 247 patients were studied. Among the 247 patients, 104 (42.11%) were males and 143 (57.89%) were females.

Age distribution of patients: In the study, highest number of patients was of the age group 21-30 years followed by 31-40 years (Table 1).

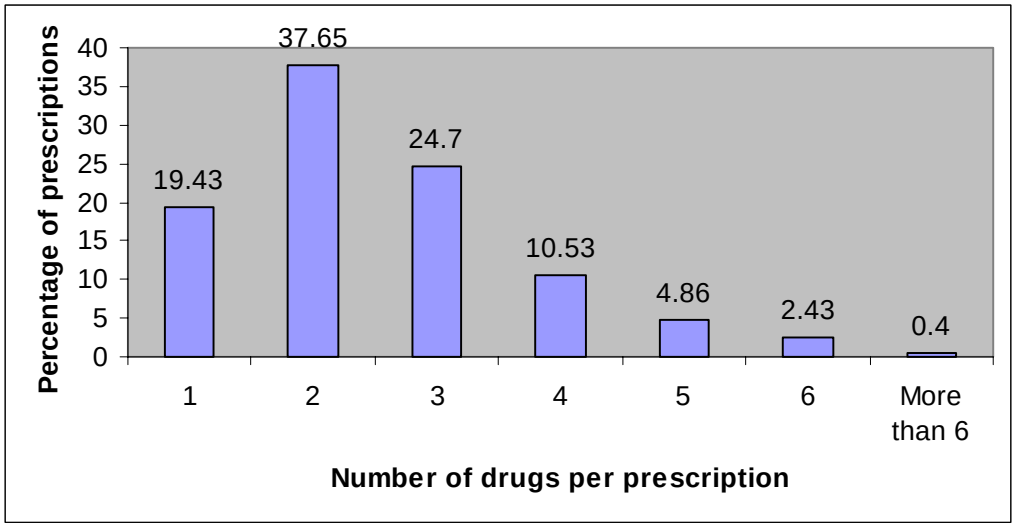
Table 1. Age distribution of patients

Age group (Yrs)	Number (%)
Less than 10	19 (7.69)
11-20	31 (12.55)
21-30	58 (23.48)
31-40	55 (22.27)
41-50	35 (14.17)
51-60	30 (12.15)
61-70	12 (4.86)
> 70	7 (2.83)

Department wise categorization of prescriptions: Department of Medicine accounted for the highest number of prescriptions [71 (28.74%)] followed by the Department of Dermatology [34(13.77%)], Ear, Nose and Throat (ENT) [30 (12.15%)], Psychiatry [27(10.93%)], Obstetrics and Gynecology (OBG) [15(6.07%)], Ophthalmology [15 (6.07%)] and Orthopedics [13(5.26%)]. Others (Pediatrics, oncology, dental, surgery and emergency /unidentified) accounted for 42 (17%) of the total prescriptions.

Number of drugs prescribed: It was found that 37.65% of prescriptions had 2 drugs per prescription. Two or three drugs were prescribed in 62% of encounters. The details regarding the number of drugs per prescription are shown in Figure 1.

Figure 1. Number of drugs prescribed per prescription



Therapeutic category of drugs prescribed: Dermatological drugs were most often prescribed, followed by CNS related drugs. The details regarding the therapeutic category of the drugs prescribed are listed in Table 3.

Table 3. Therapeutic category of drugs prescribed (n=624)

Therapeutic classification	No. of drugs	Percentage
Dermatological and other topical agents	106	16.99
Central nervous system	86	13.78
Antimicrobials	74	11.86
Cardiovascular, renal and blood	59	9.46
Antihistamines	65	10.42
Analgesics and anti-inflammatory	56	8.97
Vitamins, minerals and dietary supplements	38	6.09
Gastrointestinal system	57	9.13
Respiratory system	7	1.12
Antidiabetics	11	1.76
Hormone and Hormone antagonist	1	0.16
Autonomic nervous system	2	0.32
Anti-parasites	15	2.4
Others	53	8.49

Average number of drugs per prescription: Altogether, a total of 624 drugs were prescribed with an average of 2.53 drugs per prescription. The department wise distribution of the average drugs per prescription was studied and the details are listed in Table 2.

Table 2. Average number of drugs per prescription

Departments	Total number of drugs	Average drugs per prescription
Medicine	200	2.82
Dermatology	95	2.79
ENT	68	2.27
Psychiatry	75	2.78
OBG	34	2.27
Ophthalmology	31	2.07
Orthopedics	29	2.23
Others (Pediatrics, oncology, dental, surgery, emergency, unidentified departments)	92	2.19

Prescriptions with an antibiotic prescribed: Altogether 66 prescriptions were observed with atleast one antibiotic. The department wise distribution of encounters with an antibiotic are listed in Table 4. The highest prescriber of atleast one antibiotic was ENT department.

Table 4. Prescriptions with an antibiotic prescribed (n=66)

Departments	Number	Percentage
Medicine	13	18.31
Dermatology	10	29.41
ENT	15	50.00
Psychiatry	0	0.00
OBG	6	40.00
Ophthalmology	7	46.67
Orthopedics	0	0.00
Others (Pediatrics, oncology, dental, surgery and emergency)	15	35.71

Cost analysis of the prescriptions: The average cost per prescription was found to be 224.83 NRs. (Table 5).

Table 5. Cost analysis

Cost (NRS)	Number of prescriptions	Percentage
0-100	69	27.94
101-200	72	29.15
201-300	38	15.38
301-400	27	10.93
401-500	8	3.24
501 -600	11	4.45
>600	22	8.91

Note: 1 USD = 72.5 NRS

Dosage form: Majority of the drugs were prescribed in oral dosage forms [514 (82.37%)] followed by topical [118 (18.91%)], parenteral [2(0.32%)] and others [6 (0.96%)].

Prescribing indicators: Generic prescribing was seen only in 16.99% of the prescriptions and 11.86% of the overall drugs were antibiotics. The details of the analysis of the prescription indicators are listed in Table 6.

Table 6. Prescribing indicators

Parameter	**Prescription (%)**
Number of encounters with an injectable prescribed	1 (0.16)
Number of drugs prescribed from Hospital drug list	611 (97.92)
Number of fixed dose combinations prescribed	117 (18.75)
Number of drugs prescribed from Essential drug list of Nepal	240 (38.46)
Number of drugs prescribed from NNF	309 (49.52)
Number of drugs prescribed from WHO EDL	201 (32.21)
Number of injectable preparations prescribed	01 (0.16)
Number of antibiotics prescribed	74 (11.86)
Number of generic drugs prescribed	106 (16.99)

NNF- Nepalese National Formulary, WHO EDL- WHO essential drug list

Labeling of the medicine envelope: The Pharmacy at MTH dispenses the medicines properly packed in an envelope. It was found that all the envelopes were labeled with the name of the drug and time of intake of each medicine. However, in none of the envelopes the name of the patient was written.

Patient knowledge: It was found that all the patients knew the time of administration as well as the quantity of the drugs to be taken.

Discussion

The present study evaluated the drug use pattern and patient knowledge about the dispensed drugs using INRUD indicators. The study identified an improvement in the prescribing and dispensing pattern as well as the patients' knowledge of drug use compared to that reported previously. [12]

The average number of drugs per prescription was found to be 2.53 in this study. An earlier study from Nepal had reported an average of two drugs per prescription. [1] The current number of 2.53 drugs per prescription is to be welcomed. A previous study two years back at this hospital had reported 2.9 drugs per prescription.[12] Thus, there is an improvement in prescribing practice in terms of reducing polypharmacy. Reducing the number of drugs per prescription will help in reducing the cost and can reduce the occurrence of drug interactions. A recent study from Western Nepal reported that 53% of the patients in the internal medicine wards had experienced atleast one drug interaction (DI) during their hospital stay.[13] This will also reduce the prescription cost which can further improve the patient adherence to treatment.[14]

In this study, the common drugs prescribed were dermatological and topical drugs. A previous study in the same setting also reported a similar finding.[12] A study from this hospital identified anomalies in antimicrobial use in the Dermatology department.[15] Dermatology is an area where there can be a significant irrational use of medicines. One of the areas can be regarding prescribing fairness cream and cosmeceuticals. A group of authors from western Nepal had claimed that fairness creams can be a case of disease mongering.[16] Antimicrobials also accounted for 11.86% of the outpatient drugs. This finding was in agreement with the finding from our hospital two years back. [12] However, one should be careful while prescribing antibiotics. A study had reported that antibiotics were prescribed for viral fever [11] though it does not have a role in viral infections. A group of researchers from Switzerland recommend that an improvement in the availability of rapid diagnostic methods to distinguish viral from bacterial infections may help reduce the number of empiric therapies in favor of pathogen-targeted therapeutic treatments.[17] In order to improve rational use of antibiotics, the MTH publishes the sensitivity pattern of the common microbial isolates to commonly used antibiotics. This can help the clinicians in choosing better alternatives.[18]

We found that antihistamines accounted for nearly one tenth (10.42%) of the prescribed drugs. While dispensing antihistamines, the possibility of sedation [19], should be explained to the patients. At MTH, the pharmacists counsel the patients regarding the medications whenever required.[20] Counseling is provided to the patients in a separate area dedicated for counseling, the medication counseling center (MCC). [20]

Injectables were seen on only one prescription. A previous study reported 6.075% of the prescriptions had an injectable.[12] Dosage forms play an important role in enhancing patient compliance.

Labeling of the prescriptions as per the WHO/INRUD indicators (patient name, drug name and time of administration) was not done in any of the patients. However, the drug name and time of administration was written in all patients.

This suggests the need for managerial and frequent educational intervention to improve the labeling practices at our hospital. In the hospital pharmacy, a medications envelope is being used for dispensing the medications with the objective of improving the labeling practice. This in turn can reduce the occurrence of medication errors at the patient level.[21]

All the patients knew when to take and how much to take regarding their medications, this is to be appreciated. A previous study had reported that only 53.8% of the patients knew the administration time and the quantity of the medicines to be taken.[12] For better dispensing practice, the dispensing pharmacists should be adequately educated. At MTH, recently the Pharmacy staffs have been provided a CPE program in which the points to be counseled for common diseases and common drugs are emphasized.[22]

The cost of the prescription was found to be 224.83 NRs. (1 USD=72.5 NRs.) In a previous study two years back, the cost was 241.11 NRS.[12] It is rationale to prescribe cheaper alternatives and to avoid 'me too' drugs. One of the better means to reduce the prescription cost is by prescribing economic, inexpensive (low-price) brands with good efficacy and safety. A study from the Kathmandu valley had reported a huge variation in cost among different brands of the same drugs.[23] At MTH, the hospital drug and therapeutics committee (DTC) selects the drugs to be used in the hospital. This committee while selecting the brand, in addition to the safety and efficacy also considers cost. [24]

Fixed dose combinations (FDCs) were often promoted aggressively by the pharmaceutical companies. In this study, the use of FDCs was 19%. A North Indian study reported a higher value of 45% of FDCs. [13] A study two years back reported a FDC use of 21.67%.[12] The hospital DTC banned several FDCs during the past two years. Some of the important FDCs banned by the DTC include the FDCs of Ampicillin+Cloxacillin, Amoxicillin+Cloxacillin, several multivitamin preparations etc.[25] This may have contributed to the reduction in the FDCs prescribed indicating the positive impact of managerial interventions on rational use of medicines.

In comparison to a previous study at MTH, the number of drugs prescribed from the EDL (Essential drug list) of Nepal, NNF (Nepalese national formulary) and the WHO EDL has improved. Prescribing essential drugs plays an important role in ensuring the adequate availability of the drugs in the healthcare settings.

A study from this hospital four years back conduced on medical outpatients recorded 32.65% of generic prescribing.[26]Another study from the same hospital two years back showed that, generic prescribing was 15%. [12] At present, it was found that only 16.99% of the drugs were prescribed by generic name. Thus it was evident that there is a huge scope for improving generic prescribing. Prescribing by generic name can be of a great help in reducing the prescription cost.

Limitations: Our study had a few limitations. The number of patients studied was less and hence it may be difficult to extrapolate our findings.

Conclusion: The study identified an improvement in drug use patterns in MTH compared to the previous years. However, there was no improvement in generic prescribing. There was a reduction in the use of FDCs.

Banning the FDCs of Ampicillin+Cloxacillin and Amoxicillin+Cloxacillin in the hospital by the DTC had a positive impact. The prescription cost has also reduced compared to the past. The study also acknowledged an improvement in patient knowledge regarding their medications. However, there is still scope in reducing polypharmacy and improving labeling of the medicine envelopes by the pharmacists. There is a need for conducting long-term studies covering larger patient numbers.

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Appendix 1. INRUD encounter form

Hospital No	Patient Identifier (Name)	Age	Sex	Prescriber			Date	
Health problem	Health Problem Description/Diagnosis			Department				
Drugs	Prescription Character			Label			Patient Drug Knowledge	
	Drugs name, strength and dose	Dispensed Quantity		Patient Name	Drug Name	When	When	How Much
				(0/1)	(0/1)	(0/1)	(0/1)	(0/1)