A COMPARATIVE STUDY OF RATIONAL USE OF MEDICINES BETWEEN PUBLIC AND PRIVATE HOSPITALS OF KATHMANDU, NEPAL

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ABSTRACT

Irrational prescription is of common occurrence in clinical practice and has been overlooked in our country. The main objective of this study is to analyze and compare the prescriptions using WHO drug use indicators between public and private hospitals in Kathmandu. As per WHO consideration, 100 prescriptions were taken from each institution. In total, 52% were male and 48% were female patients. Percentages prescribed by generic name, antibiotics, injection and from Essential Medicine List (EML) were 20%, 46%, 8% and 21.5 % respectively. An average number of medicines were 2.82±1.32. An average consultation and dispensing time was 8.5±4 minutes and 3.8±2 minutes respectively. Dispensing was100% but neither of them was properly labeled. Both facilities do not have a copy of EML in their dispensaries. Patient's age group had positive correlation with number of medicines and negative correlation with number of antibiotics. Average medicines and prescription from EML was marginally higher in private hospital with no statistical significance of difference between mean. Medicines prescribed by generic names and encounter with an antibiotic were high in public hospital with no statistical significance of difference between mean. Injection prescription was significantly high in public hospital. Private hospital had significantly longer consultation time but dispensing time was significantly shorter. The findings of this study indicate the irrational use of medicines in both facilities. There is need for implementation of EML as well as development of "Prescribing Guidelines" and "Medicine Information Centers" in all healthcare facilities of Nepal.

KEYWORDS

Essential Medicine List (EML), polypharmacy, rational prescription, WHO drug use indicator

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INTRODUCTION

The medicines that are most effective and comparatively safe are used for the treatment of most diseases worldwide and these medicines should be easily accessible, affordable and should be used rationally. With reference to WHO, "rational use of medicine requires that the patients receive medication appropriate to their clinical needs in doses that meet their own individual requirements for an adequate period of time, and at the lowest cost to them and to their community".[1] Rational use refers to appropriate selection, procurement, storage, prescribing, dispensing, monitoring and feedback.[2] The Nepalese Formulary has given five important criteria for rational use of medicine in Nepal as accuracy of diagnosis, selection of appropriate medicine, correct dispensing, suitable packing and patient's compliance.[3] Irrational prescription of medicines is of common occurrence in clinical practice.[4] In both the developed and the developing countries, inappropriate, ineffective and economically inefficient use of medicines are common occurrences in health care facilities. Worldwide it is estimated that over half of all medicines are prescribed, dispensed or sold inappropriately and that half of all patients failed to take their medicine correctly.[5] The costs of such irrational use of medicines are enormous both in terms of financial loss and adverse clinical consequences including adverse drug reactions, drug resistance, protracted illness and even death.[6,7] A list of essential medicines should be implemented at different levels of health care as a rational drug use program for developing and developed countries.[8] The prescription actually consists of three main domains: the physician's order in the patient's chart, the written order to which the pharmacists refers when dispensing and the patient's medication container with a label affixed.[9] Monitoring of prescriptions as well as drug utilization studies can identify the problems and provide feedback to prescribers so as to minimize irrationality in use of medicine.[10]

MATERIALS AND METHODS

This cross sectional study of outpatient treatment was conducted at two institutes, one public and one private hospitals of Kathmandu, Nepal. Ethical approval was taken from Research and Institutional Review Committee of Nepal Medical College Ref No 016-074/075. Data was collected over 6 month's time in each research site. Prescription issued to the outpatients was included in the study. Patients were approached at outpatient hospital pharmacy and were invited to participate after taking informed consent. A specific questionnaire form was filled for each patient using WHO drug use indicators (WHO, 1993).[11] As per WHO consideration, 100 samples were taken from Nepal Medical College and Teaching Hospital(NMC-TH) as private hospital and another 100 from Institute of Medicine (IOM) as public hospital. The research team was previously trained to conduct interview and collect data.

For analysis purpose, data from healthcare facilities was divided into two groups i.e. Public and Private and comparison was made among these two groups. Data was analyzed using Statistical Package for the Social Sciences (SPSS) version 16 and expressed as frequency, percentage, mean and standard deviation (SD). Associations between patients' age groups and number of medicines prescribed or number of antibiotics prescribed per encounter was analyzed using the Pearson's chi-square test with adjusted standardized residuals (0.01 level of significance). Student t-test was used to assess the statistical significance of difference between means. A p-value < 0.05 was considered to be statistically significant.

RESULTS

A total of 200 prescriptions were assessed including both facilities. Out of which 52% were male and 48% were female. An average age was 20.20±18.25 years with minimum age of 1 years and maximum of 72 years. Percentage of Medicines prescribed by generic name, antibiotics, Injection and from EML was 10%, 23%, 4% and 74% respectively. The average consultation time was 8.5±4 minutes and dispensing time was 3.8±2 minutes. All of the prescribed drugs were dispensed in both healthcare facilities but were not properly labeled at both the facilities. Both facilities have copies of their own formularies in their dispensaries but neither of them had a copy of EML.

Table1: Demographic information on prescriptions.

	Public (%)	Private (%)	Total (%)
Sex			
Male	49%	55%	52%
Female	51%	45%	48%
Age group			
≥12 years	42%	57%	49.5%
13-50years	49%	36%	42.5%
≤50years	9%	7%	8%
Prescribed by Generic name	12.1%	7.6%	10%
Antibiotics prescribed	23.5%	22%	23%
Injection prescribed	6%	2%	4%
Prescribed from EML	71.9%	77%	74.1%
Drug dispensed	100%	100%	100%
Drug labeled	0%	0%	0%
Patient knowledge of correct dose	Yes =58% No=42%	Yes =79% No=21%	Yes =68.5% No=31.5%

A positive correlationship between patient age group and number of medicines prescribed was found but was

not statistically significant at 0.01 level of significance i.e. r(198)=0.027, p=0.708. A negative correlationship between patient age group and number of antibiotics prescribed per encounter was found and wasn't statistically significant at 0.01 level of significance i.e. r(198)= -0.130,p=0.067.

Private hospital: Out of 100 encounters, 55% were male and 45% were female. The average age of the patient was 17.1±16.87 years. The average of medicine per encounter was 2.87±1.292. Percentage of medicines prescribed by generic name was 7.6%. Percentage encountered with at least 1 antibiotic was 55% and having 2 and 3 antibiotics were 12% and 5% respectively. Percentage of encounter with an injection prescribed was 2%. Percentage of medicines prescribed from EML was 77%. Maximum of 20 minutes consultation time was given to 8% encounter and minimum of 5 minutes to 28% encounter. Dispensing time of 1 minute, 5minutes and 10minutes were given to 9%, 43% and 3% of encounter respectively. The patient knowledge of correct dose was 79%.

Public hospital: Out of 100 encounters, 49% were male and 51% were female. The average age of the patient was 23.31±19.09 years. The average of medicine per encounter was 2.78±1.36. Percentage of Medicines prescribed by generic name was 12.1%. Percentage encountered with at least 1 antibiotic was 47% and having 2 and 3 antibiotics were 11% and 2% respectively. Percentage of encounter with an injection prescribed was 6%. Percentage of medicines prescribed from EML was 71.94%. Maximum of 15 minutes consultation time was given to 2% and 48% of encounter got 5 minutes whereas a 10 minutes consultation time was given to 20%. Dispensing time of 1 minute, 2 minutes and 10 minutes were given to 12%, 28% and 2% respectively. The patient knowledge of correct dose was 58%.

Table 2: Indicators of irrational drug prescribing in private and public hospital.

	Public (n±SD)	Private (n±SD)	Total (n±SD)	p-value
Prescribing Indicators:				
Number of drug per encounter	2.78±1.36	2.87±1.29	2.82±1.32	0.63
Medicines prescribed by generic names	0.35±0.79	0.22±0.48	0.28±0.66	0.16
Encounters with an antibiotic prescribed	0.62±0.76	0.67±0.87	0.64±0.82	0.66
Encounters with an injection Prescribed	0.24±0.81	0.06±0.31	0.15±0.62	0.04
Medicines prescribed from EML or Formulary	2±1.42	2.19±1.77	2.1±1.6	0.40
Patient care indicators:				
Consultation time	6.93±2.64	10.07±4.6	8.5±4	0.00
Dispensing time	3.47±2.17	4.12±1.89	3.8±2	0.02

DISCUSSION

Irrational prescription and use of medicines has been a major concern in both developed as well as developing countries and is emphasized by WHO for the promotion of rational use. Although patient's knowledge of medicines is considered to be indispensible regarding treatment and quality of dispensing, it has been generally unnoticed in our country. Inappropriate use may lead to adverse effects, submaximal outcomes, waste of money as well as time of both health professionals and patients. A number of educational programs had been developed to improve the teaching of pharmacotherapy. WHO has also developed a manual for undergraduate medical student on the principle of rational prescribing.[11]

The main objective of this study was to study and analyze the prescriptions in outpatients departments, measure the degree of polypharmacy and to compare the rational use of medicines between private and public hospital of Kathmandu valley, Nepal using WHO/INRUD drug use indicator for health facilities.[12]

Average number of medicines per encounter was more in private hospital than public hospital with no statistical significance of difference between mean (p=0.633) and is near to the value recommended by WHO i.e. it should be <2. On total, the average number of Medicines per encounter was 2.82 which is similar with the finding of Alam *et al* (2.91) in western Nepal, Choreonkul *et al* (2.35) in Cambodia and Lifang *et al* (2.36) in China.[13-15] The incidence of polypharmacy is low in comparison with the study done by Basnet *et al* (8.19) and Prasad *et al* (6.25). A positive correlationship between patient age group and number of medicines was seen which is similar with the study done by Ferreira *et al* in Brazil and Vallano *et al* in Andorra.[16, 17] The incidence of polypharmacy is not seen in this study because only 8% of the patients are above 50 years whereas in Basnet *et al* and Prasad *et al* are geriatric patients.[18, 19]

Public hospitals have better percentage (12.1%) of drug prescribed by generic name than private hospitals (7.6%) (p=0.164). However this is low than the WHO recommendation (should be close to 100%) in both facilities. This is similar to the findings by Alam *et al* (15%) in western Nepal, Sarraf *et al* (0%) in Eastern Nepal, Pandey *et al* (7.4%) in India, Zhang *et al* (10.7%) in China.[13,20-22] The possible explanation for these low figures could be due to the lack of knowledge of EML to the health professionals responsible for prescribing

or may be due to the influence of pharmaceutical companies which are always focused on promotion of proprietary names of drug.

A list of medicine products that are to be counted as antibiotics provided by WHO model list of essential medicines was used as indicator of antibiotic use.[23] Out of 200 cases, 23% of the encounter had antibiotic prescribed which is similar with Pradhan *et al* (28.1%) in Nepal and Igbiks *et al* (34.4%) in Nigeria.[24-25] Percentage of encounter with antibiotics prescribed was higher in public than in private hospital (p=0.66). Higher rate in public hospital could be due to greater number of patients visiting public hospital than private hospital thereby increasing the frequency of antibiotics encountered.

Percentage of encounter with IV prescribed medicines was higher in public (6%) than private hospital (2%) (p=0.04). On total encounter, 4 % prescription had IV prescribed medicines which was similar with the study done by Alam *et al* (2.9%) in western Nepal and Sumana *et al* (6.8%) in India.[13,26] The reason behind low rate of IV prescription is due to difficulty in administration of drug compared with oral dosage form and its less availability for outpatients.

Percentage of medicines prescribed from EML was higher in private (77%) than public hospital (71.9%) but wasn't statistically significant (p=0.406). However both hospitals do not meet the criteria given by WHO (should be close to 100%). Overall, 74.1% of the medicines were prescribed from EML which is similar as compared with the study done by Sarraf *et al* (70.61%) in 2015 at eastern Nepal and Joshi (56.3%) in 1992 at IOM, Kathmandu indicating that not much effort has been made in past to implement EML in Nepal effectively.[20, 27]

Private hospital had a significantly longer consultation time (p=0.00) but dispensing time was shorter in the public hospital (p=0.02). The average consultation time was 8.5 minutes (optimal ≥10 minutes) which is similar with the Santos *et al* (9.2 minutes) in Brazil.[28] The average dispensing time was 3.8 minutes (optimal ≤90sec) which is higher in comparing with Santos *et al* (18.4 sec) and similar with Hazra *et al* (3.7 minutes).[28,29] Higher percentage of patients visiting private hospital had knowledge of correct dose than public. In total 68.5% patient had knowledge of correct dose which is similar with the finding of Santos *et al* (70%) and Atif *et al* (62.1%) in Pakistan.[29,30] Since proper labeling was not found in any encounters, suggesting that there is inadequate knowledge of labeling of the medicines in Nepal. Lack of EML and availability of only key medicines in hospital dispensaries may be due to the fact that both hospitals do not run their own dispensaries.

In conclusion, the private hospital was better than public hospital, though no statistical significance of difference between mean was found. Irrational use of medicines was found in both facilities. The medicine prescribing patterns from EML and by generic names were significantly low. The use of medicine was not based on WHO criteria for rational use and the system was not at all evidence based. It is necessary that doctors must maintain the noble status of their profession and should emphasize about the use of medicines from EML with generic names. Also, there is a need for the development of "Prescribing Guidelines" and "Medicine Information Centers". Every institution must have their own 'Medicine and Therapeutic Committees' as suggested by WHO. The findings of this study may help to identify whether or not health center prescriptions follow the desired national guidelines. The conclusion drawn from this study may help to analyze the irrationality in prescription of medicines.

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