



A Study on Evaluating Prescriptions in Emergency Unit of Tertiary Care Teaching Hospital Based on Who Prescribing Indicator

M Kumaraswamy, Laxman Wagle*, Jeet Bahabhur Moktan, Niraj Shrestha, Treesa Augustine

Department of Pharmacy Practice, Sri Adichunchunagairi College of Pharmacy, BG Nagar, 571448, Karnataka, India

***Corresponding author e-mail:** waglelaxman@gmail.com

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ABSTRACT

Aim of this study was to evaluate the prescribing habits of physician in emergency unit of tertiary care teaching hospital based on World Health Organization prescribing indicators. A prospective observational study for a period of 6 months was conducted after ethical research committee approval. All the patients visiting at emergency unit were enrolled. Data were measured in frequency, mean and percentage using Microsoft excel. Among 600 patients, we found males (68.66%) were more than females (31.33%) and majority (35.83%) under the age group of 21-40 years. Average number of drugs per prescriptions were 4.01 ± 1.68 where 22.28% of drugs were generics, 16.33% of drugs were antibiotics, 83% of drugs were injections, 89.98% of drugs were from Indian essential drug list and 62.30% of drugs were from WHO essential drug list. Based on these results it was possible to promote rational use of drugs by improving physician prescribing habits.

Keywords: Emergency Unit, WHO prescribing indicator, polypharmacy

INTRODUCTION

Rational prescribing refers to prescribing of right drug to the right patient, in the right dose, at right time intervals and for right duration. However, irrational prescribing has been widely reported both from the developed as well as the developing world.^[1]The emergence of antibiotic resistant bacterial pathogens is taken as consequence of over uses of antibiotics worldwide.^[2,3]Over use of drugs (polypharmacy), inappropriate use of antibiotics (often in inadequate dosage for nonbacterial infections) and overuse of injectables are the common types of irrational drug use which could lead to poor treatment outcomes, drug-drug interactions, high economic burden and to the worst case loss of the patient's life. Prescribing indicators are established to track such irrational use in prescriptions developed by World Health Organization (WHO) in a collaborative work with

International Network for Rational Use of Drugs (INRUD).^[4]These indicators can be used efficiently in many settings of drug use study to detect problems in drug prescribing such as polypharmacy, inclination for branded products, over use of antibiotics or injections and prescribing out of formulary or essential drugs list.^[5]Study of prescribing practices using prescribing indicators enables us to detect these problems and to prioritize and focus subsequent efforts to correct them. Such studies accompanied with providing feedbacks to prescribers at regular intervals has been proved to be an effective strategy to optimize the use of antibiotics and other drugs and also to reduce the resistance related problems.^[4-6]In these instances where irrational prescribing is prevalent, teaching hospitals would have played a special responsibility toward society to promote rational prescribing by their staff and, through them, the future generations of doctors. This may or may not be happening in our hospital. Very few hospitals

has performed such studies in emergency unit in India using these methods where they documented signal of irrational use. To date no such studies has been carried out in our hospital. Keeping these things in mind we conducted a research work to document possible irrationality in prescription based on WHO prescribing indicator for our hospital in emergency unit. Benefit of this research is to identify problem areas in drug use and to provide feedback to prescribers.

Following was the specific objective of our intended work.

- To observe WHO based drug use prescribing indicators in emergency unit of tertiary care teaching hospital..

MATERIALS AND METHODS

Study site: The study was conducted in the emergency department of Adichunchanagiri Hospital and Research Centre, B.G.Nagara, South India. It is a 1050-bedded, tertiary care, teaching, service oriented hospital.

Study Design: This was descriptive, observational study

Study duration: The study as carried out for a period of 6 months.

Source of data and materials: Data collection form, Prescriptions and Treatment chart.

Inclusion Criteria: All patients who were admitted in emergency department, willing to participate in the study & given written consent

Study population: 600 patients

Ethical approval: Ethical approval was obtained before conducting research from Intuitional Human Research Ethics Committee of AH and RC.

Study procedure: All the patients admitted to the emergency unit were reviewed during the study period after ethical research committee approval. Patients were enrolled after taking written consent from each patient or patients care taker the suitably designed data collection form was used to collect all the necessary information. WHO "prescribing indicators" were observed which measured the performance of prescribers. These indicators were calculated as follows.

1. Average number of drugs per encounter: Average, calculated by dividing the total number of different

drug products prescribed, by the number of encounters surveyed. It is not relevant whether the patient actually received the drugs.

2. Percentage of drugs prescribed by generic name: Percentage, calculated by dividing the number of drugs prescribed by generic name, by the total

number of drugs prescribed, multiplied by 100. 3. Percentage of encounters with an antibiotic

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

4. Percentage of encounters with an injection prescribed: Percentage, calculated by dividing the number of patient encounters during which an injection is prescribed, by the total number of encounters surveyed, multiplied by 100.

5. Percentage of drugs prescribed from essential drugs list or formulary: Percentage, calculated by dividing the number of products prescribed which are listed on the essential drugs list or local formulary (or which are equivalent to drugs on the list).

Statistical analysis of data:The data were subjected to descriptive statistical methods like frequency, percentage, mean, SD (Standard Deviation) as appropriate using Microsoft excel. Microsoft word and excel had been used to generate bar graph, pie charts and tables.

RESULTS

Among 600 patients cases; we found 8.66% within age group of 10-20, 35.83% were within the age group of 21-40 years followed by 30.83% in age group of 41-60, 20.66% within age group of 61-80, and 4% within age group of 81-100. Likewise gender distribution showed us that 68.66% were male and 31.33% were females. Stratification of patient based on employment status showed that 49.66% of patients were employed and 50.33% of patients were not employed. Among the patient who were employed; 45.97% were depending on agriculture followed by business (32.55%), service (17.785%), and teacher (2.34%).Economic status showed that 50.33% of patients were not employed followed by 32.166% of patient whom income was more than Indian Rupees 5000 and rest of the patient i.e. 17.66% were having income below Indian Rupees 5000.

The total of 2406 drugs was prescribed in 600 prescriptions in our settings. WHO prescribing indicators showed us that average number of drugs per prescription was 4.01 ± 1.68 , percentage generics was 22.28%, percentage of antibiotics was 16.33%, percentage of injections was 83%, percentage of

drugs prescribed from the Indian Essential medicine List 2015 was 89.98%, percentage is drugs prescribed from the WHO Essential Medicine list 2011 was 62.30%. We had also seen prescriptions containing 1 drug was 2.33%, 2 drugs were 15.33%, 3 drugs were 24.83%, 4 drugs were 23%, 5 drugs were 17.33%, 6 drugs were 9.83%, 7 drugs were 4.83%, 8 drugs were 1%, 9 drugs were 0.5%, 10 drugs were 0.5%, 11 drugs were 0.16%, 12 drugs were 0.16% and 13 drugs were 0.16%. In the generic prescribing patterns, 41% prescription did not consist any generic drugs whereas prescriptions containing 1 generic drug was 37.16%, 2 generics were 15.83%, 3 generics were 4.16%, 4 generics were 1.33%, 5 generics were 0.33% and 6 generics were 0.16%. The generic prescribing pattern in male was 70.170% and female was 29.829%. The economic status based generic prescribing pattern was 17.045% among the people earning less than Rs 5000 per month and 34.375% was among those earning more than Rs 5000 per month and 48.579% of generics were for unemployed patients. Similarly among the total antibiotics prescribed, the prescriptions containing no antibiotics were 37.83%, 1 antibiotic was 52%, 2 antibiotics were 8.33%, 3 antibiotics were 1% and 4 antibiotics were 0.83%.

DISCUSSION

The emergency department of a tertiary care unit of a developing country is faced with the problem of heavy patient load, human and economic resources. Irrational drug use in such set up will be common. Our hospital is also providing emergency services to different strata of patient population in rural area. In our hospital, drugs were prescribed mainly by internal medicine physicians and interns. We had seen 600 patients attending emergency department during study period where we observed their prescription for WHO drug use prescribing indicators in an aim to document physician prescribing habits. To date this type of study was not performed in this hospital at emergency department.

DEMOGRAPHIC DETAILS OF PATIENT

Gender distribution

In our study we had seen males (68.66%) were frequently admitted to emergency departments in comparison to females (31.33%) Sulaiman Sait et al.^[7] and K.A. A Balushi, et al.^[8] had also seen that males were more dominant in comparison to females in their research in emergency units.

Age distribution

In our study we found that people with age group of

21-40 years were most common (35.83%) to visit emergency department. Other researchers had also seen the similar trends^[7,9]. This result also tells us that elderly people (>60 years) are lessly (i.e. 128/600) visiting the department. In our study road traffic accident were the most common diagnosis which may be the reason younger and active population accounts for more visits.

Employment and Economic status

In our study half of the patients were not employed (50.33%) and rest were having some sort of economic activity. Our hospital lies in the rural area. Among these employed groups most of them were following agriculture as a profession followed by business, teacher and other services. To these employed population; most of them were having income more than 5000 rupees per month. Our study highlighted that consideration to optimize the cost of illness to unemployed patient groups is needed because they are paying out of pocket and are the population which can be easily non-compliant.

WHO DRUG USE PRESCRIBING INDICATORS

Average number of drug per prescription

The average number of drugs per prescription, which was shown to be an important index of the standard of prescribing in this study, was found to be 4.01 ± 1.68 . This result was similar to a value of 4.2 ± 1.2 , a study done by Chakrapani^[10], Sharonjeet^[11] (4.9), Balushi KAA^[8] (3.16 ± 1.89) but was higher than WHO recommendation which should be 2.0.^[12] We had also seen the fact that prescription contained at minimum of one drug to maximum of 13 drugs to manage different conditions where 24.83% of prescriptions contained 3 drugs at high frequencies followed by 4 drugs per prescription (23%), 5 drugs per prescription (17.33%) and so on. It is possible that when the patient was ill and the diagnosis was not yet confirmed at the time of admission, empirical polypharmacy will be required. However, it is always preferable to keep the mean number of drugs per prescription as low as possible to reduce the cost of treatment and to minimize the adverse effects and drug interactions.

Percentage of drugs prescribed with generics

The majority (77.7%) of drugs was prescribed by trade name showing less generic prescribing (22.33%) in our study. At minimum 6 generic name drugs were seen 1 time and at maximum 1 generic name drug was seen 223 times in prescriptions based on number of generic drug per prescription. Other studies by Sharonjeet K^[11], Pandey K^[9] and Cheekavalu C^[10] had also seen less generic

prescribing. There may be multiple reasons for this; physician prefers to write brand names of drugs of reputed rather than by generic names though there are no differences in efficacy, safety and quality and also due to vigorous promotional strategies by pharmaceutical companies. Generic name drugs are very cheaper than brand name drugs. Physicians opinion of uncertain bioequivalence of generic drugs due to lack of awareness of regulation of generic drug is another reason. There is no disadvantage of generic prescribing. Generic prescribing helps the hospital pharmacy to have a better control of inventory. This will also help the pharmacy to purchase the drugs on contract basis, as the number of brands will be less. It can also reduce the confusion among the pharmacists while dispensing. Use of generic names of prescription eliminates the chance of duplication of drug products and reduces the cost of the patient. In our study we had also seen patient related factors for generic prescribing which highlighted that males and unemployed patients were frequently prescribed with generic names. This result is very welcoming. Generic prescribing is very important in our hospital where no hospital formulary exists.

Percentage of drugs prescribed with antibiotics

This indicator shows the potential signal for irrational use of antibiotics. Antibiotics are among the most commonly prescribed drugs in hospitals and in developed countries around 30% of the hospitalized patients are treated with these drugs^[13]with the numbers much higher in developing countries.^[14]In our study we had seen very less use of antibiotics i.e. 18.70% of total drug prescribed which was similar to studies done by Sharonjeet K^[11] and Balushi KAA^[8]It is however that Pandey K^[9] had observed 93.6% of prescription containing antibiotics. Reason for high use in their studies was over estimation of the severity of illness and a dire need to give broad spectrum antibiotics as empirical therapy before sensitivity reports come. In our study most commonly used class of drug is antibiotic; pattern of their use shows there will be chance of inappropriate utilization. It is because upto 4 antibiotics were seen in set of prescriptions and more than half prescriptions contained at least one antibiotic. It shows that still there needs a review of these antibiotics to document rational drug use.

Percentage of drugs prescribed from Indian/WHO Essential medicine list

By adhering the prescribed drugs to essential list either WHO for general or National as country

specific we ensure the cost effective drugs are utilized and accessible for society. Some hospital will be having their own drug formulary but in our hospital it lacks such list and wide brands of drugs are available which denotes haphazard management of stocks. It is however that 89.98% of drugs were included from national essential list and 62.3% from WHO essential list in our hospital. It shows that cost effective drugs were utilized and available in our hospital in some extent. In comparison to other studies like Sharonjeet K^[11], Pandey K^[9], Cheekavalu C^[10]our hospital is more adhered to such list. It is high recommendation to develop own hospital formulary list to further increase rational drug use in our hospital.

Percentage of injection drug prescribed

It is rational to choose intravenous route in emergency department because we need faster and predictable action, which is possible through this dosage form. Problems in injection dosage form are high cost, less convenience for patient to administer, more chance of adverse consequence like pain, extravasation, requiring skilled professional to administer etc indicating more health care resource utilisation. In our study 83% of drugs were prescribed with this dosage form and this value is more in comparison to other studies.^[8-10]We want to conclude that when injections are prescribed; close monitoring and consideration of switching to oral regimens is necessary to increase rational drug use.

CONCLUSION

Based on WHO drug use indicators there are still lot of improvements to be done for rational prescribing. Though drugs from essential medicine list is selected in higher rates prescribing of drugs in generic name is very less and has to be promoted and implementation of formulary system is urgently needed to provide cost effective drugs to these poor rural peoples. Polypharmacy in our study is high which can increase the chance of drug interaction, adverse drug reaction and cost. Practice of prescribing antibiotic for prophylaxis treatment has to be reviewed based on antibiotic resistance problem globally.

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Table 1: DEMOGRAPHICS DETAILS OF POPULATION

Patient details	Frequency (N)	Percentage (%)
Age		
10-20	52	8.666
21-40	215	35.83
41-60	185	30.833
61-80	124	20.6667
81-100	24	4
Sex		
Female	188	31.333
Male	412	68.66
Employment status		
Employed	298	49.666
Agriculture	137	45.973
Business	97	32.550
Teacher	7	2.348
Service	53	17.785
Others	4	1.342
Not employed	302	50.33
Economic Status		
<5000	106	17.666
>5000	193	32.166
Not employed	302	50.333
Total	600	100%

Table 2: WHO DRUG USE PRESCRIBING INDICATORS

Indicators	Our settings	Balushi KAA ⁸	Sharonjeet K ¹¹	Pandey K ⁹	Cheekavalu C ¹⁰
Total Number of drugs	2406	939	5390	2004	996
Total prescriptions	600	300	1100	250	200
Average number of drugs per prescription	4.01±1.68	3.16±1.89	4.9	8.01±1.93	4.2 ± 1.2
% of drugs prescribed with generics	22.28%	-	29.17%	18.86%	5%
% of drugs prescribed with antibiotics	16.33%	10%	14.89%	93.6%	
% of drugs prescribed with injection	83%	38%	75.17%	97.6%	79.96%
% of drugs prescribed from Indian Essential medicine list 2015	89.98%	-	64.94% (2003)	-	21.78%
% of drugs prescribed from WHO Essential medicine list	62.30%	58%	-	2.14	63.45%

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