

ASSESSMENT OF PRESCRIPTION PATTERN AND PRESCRIPTION ERRORS USING THE WORLD HEALTH ORGANIZATION DRUG USE INDICATORS IN LADY READING HOSPITAL PESHAWAR, PAKISTAN: A RETROSPECTIVE STUDY

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ABSTRACT

OBJECTIVES: To assess and evaluate prescription pattern and prescription errors using World Health Organization (WHO) drug use indicators in the medical ward of Lady Reading Hospital, Peshawar, Pakistan.

METHODS: This retrospective study of 200 in-patient's prescriptions was conducted to investigate the WHO drug use indicators (average number of drugs prescribed per prescription, percentage of prescriptions encounter with an injection(s) prescribed, percentage of prescriptions encounter with an antibiotic(s) prescribed, percentage of drugs prescribed with generic names, percentage of drugs prescribed from the WHO's Essential Drug List (EDL), drugs prescribed from the National Essential Drug List (NEDL) and prescriptions errors.

RESULTS: Drugs prescribed for 200 admitted patients were 1410 and average number of drugs prescribed per prescription were 7.05 (n=1410). Prescriptions with an injection(s) prescribed were 704/1410 (49.9%), prescriptions with an antibiotic(s) prescribed were 241/1410 (17.1%), prescriptions with drugs prescribed by generic names was none. Number of drugs prescribed from the WHO EDL were 704 (49.9%). NEDL was not available. A total of 572 (40.6%) errors in prescription writing were observed including 211/572 (36.9%) errors having absent strength of drugs, 267/572 (46.7%) contains an illegible hand writing prescriptions, 48(n=572; 8.4%) prescriptions have missing frequency of drugs and 46 (n=572; 8.04%) prescriptions had improper abbreviations. Decision errors were observed in 703 (n=1410;49.86%) cases for drug-drug interactions.

CONCLUSION: Illegible hand writing, absence of strength of drugs, no mentioning of frequency of drugs and improper abbreviations were main types of prescription errors while error in drug-drug interactions was the main decision error in our study.

KEY WORDS:

Medical Errors (MeSH); Medication Errors (MeSH); Inappropriate Prescribing (MeSH); Prescription Errors (Non-MeSH); Prescription Pattern (Non-MeSH); Drug Use Indicators (Non-MeSH); Drug-Drug Interactions (Non-MeSH).

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INTRODUCTION

Rational use of drugs means that patient receives medications for

right indications in the appropriate doses at the lowest cost and for correct period of time.¹ The irrational use of medications arises problems in many

populations of the world which should be manage, the World Health Organization (WHO) has developed guidelines in their international conference held in 1985 at Nairobi, Kenya.² Essential drugs consist of a set of medications that fulfills the needs of a community health, they should be available in the appropriate dosage forms in adequate quantity at all times.³ This idea was developed to promote the health status and enhance positive impacts of medications on the peoples of developing countries.^{4,5} It is investigated worldwide, that 50% patients failed to take medicines correctly, more than half of drugs are sold, prescribed and dispensed in a wrong way and about one third population of the world has limited access to essential drugs.⁶ Irrational prescriptions are major health problems globally. It has been investigated that bad prescribing habits cause unsafe treatment, deterioration of illness, harm the patient and imposes higher costs due to prolongation of therapy.² Assessment of prescription pattern with the use of the WHO prescribing indicators in the developing countries is significant for the enhancement of rational drug usage.⁵ These indicators includes are, average number of drugs encounter per prescription, percentage of patients encounter with an injection (s) was prescribed, percentage of patient encounter with an antibiotic (s) prescribed and percentages of drugs prescribed with generic names etc.⁷

Medication errors are often prevalent in hospitals and about 30% problems arising due to medication errors during hospitalization.⁸ Medication errors may occur during disease treatment process from drug selection to their administration. Various research studies have shown that health of patients were

harmed due to medications errors and majority of them were errors in prescription writing process.⁹

Based on the above mentioned reported data from different researchers in the world and it is also clear that little attention has been paid to this area of health study in our set up, therefore; the current research study was developed to investigate prescription pattern and medication errors and their consequences in a tertiary care hospital of Peshawar, Pakistan.

METHODS

This retrospective research study was carried out in the medical wards A & B of Lady Reading Hospital Peshawar, Pakistan from 1st January 2015 to 1st March 2015. The current research study includes 200 prescriptions that were investigated for the assessment of prescription pattern and medication errors.

Study design

Retrospective study of hospitalized patients in the medical ward was conducted.

Study population

The prescriptions of 200 patients admitted in medical units A & B of Lady Reading Hospital Peshawar, Pakistan from 1st January 2015 to 1st March 2015 were used as a source of research data.

Inclusion criteria

Those patients were included whose hospital stay wasn't less than 48 hours and who were concurrently taking two or more medications.

Exclusion criteria

1. Incomplete patient prescriptions missing with potential variables (e.g. dose, frequency, date etc).
2. Patients whose hospital stay was less than 48 hours.
3. Those patients who were taking two or more drugs but not concurrently.
4. Patient on a single drug therapy was excluded.

Data collection

The research data was collected on a special proforma designed by the

Department of Pharmacy, Shaheed Benazir Bhutto University, Sheringal, Dir (Upper), Khyber Pakhtunkhwa, Pakistan over 60 days of research study by skilled internes of Pharm-D program. The data was analyzed by the internes retrospectively from the medication charts of the patients for investigation of prescription pattern and medication errors.

Data analysis

Microsoft excel sheet and online Medscape drug interaction checker software was used for the evaluation of percentages and drug-drug interactions.

RESULTS

In the current research study prescriptions of 200 admitted patients were investigated for the assessment of prescription pattern and medication errors and containing 113 (56.5%) male and 87 (43.5%) were female patients. A total of 1410 drugs were prescribed including 809 (57.4%) to male and 601 (42.6%) to female patients. Majority of patients (n=73/200; 36.5%) were in the age group of 28-45 years (Table I).

The current research study reports the WHO drug use indicators (prescription writing process guidelines) such as, average exposure of drugs per patient was 7.05 (1410 prescription for 200 patients). The percentage of prescriptions prescribed with an injection (s) were 704/1410 (49.93%) and the percentage of prescriptions prescribed with an antibiotic (s) were 241/1410 (17.09%). National Essential Drug List (NEDL) was not available (Table II).

A total of 572 medication errors in prescription writing process were encountered consists of 211 (36.89%) were found in prescriptions in which strength of drugs were absent, 267 (n=572; 46.68%) errors was found with an illegible hand writing prescriptions (Table III).

DISCUSSION

The current research study consists of 200 admitted patient's, their prescriptions were evaluated retrospectively and it was found that 113 (56.5%) prescriptions of male and 87 (43.5%) were of female patients in this data. A total of 1410 drugs were prescribed to 200 hospitalized patients. The age group 28-45 years contains most of the patients 73 (n=200;36.5%) and they were adults. In the current study the WHO drug use indicators found was the average number of drugs prescribed per prescription was 7.05 and this figure was more than the results reported by 3.5 in Iran,¹⁰ 4.5 in Pakistan,¹¹ 1.3 in Zimbabwe,⁵ however, it was less than the data reported in Kathmandu University Teaching Hospital Nepal.¹² According to the WHO defined indicators, the average number of drugs prescribed per prescription should be comparable in the range of standard 1.6-1.8 as derived or ideal value.¹³ The research data reported by many researchers has shown that the number of drugs per prescription is directly proportional to the risk adverse drug reactions, drug-drug interactions and contraindications.¹⁴ Current study describes that poly-pharmacy practices are prevalent in the said hospital. The percentage of prescription prescribed with an injection (s) was 704 (49.93%) which was higher in the data reported in India 3.9%,¹⁵ Tanzania 19%.¹⁶ According to the WHO, it should be in the range of 13.4-24.1%. It is significant to decrease the use of injections for the preventions of infectious diseases like hepatitis, tissue necrosis, HIV/AIDS and injection related risks. It was also observed in the current study that over injection prescribing practices are prevalent in the hospital. In this piece of research study, the percentage of patients encounter with an antibiotic (s) prescribed was 241(17.09%) which

TABLE I: AGE WISE PATIENTS DISTRIBUTION

Age group (years)	Number of Patients (n=200)	Percentage
10-27	46	23
28-45	73	36.5
46-63	54	27
64-81	25	12.5
82-99	2	1

TABLE II: ASSESSMENT OF WHO DRUG USE INDICATORS

WHO drug use indicators	WHO Recommended standard values (range/ %age)	Observed Frequency n= 1410
Total no. of drugs recommended to patients	-----	1410
Average number of drugs per prescription	1.6-1.8	7.05
Percentage of prescriptions with an injection(s) prescribed	13.4-24.1%	704 (49.9%)
Percentage of prescriptions with antibiotic(s) prescribed	20-26.8%	241 (17.1%)
Percentage of drugs prescribed with their generic names	100%	0.00 (0.00%)
Prescription of drugs prescribed from the WHO Essential drug list	100%	845 (49.9%)
Drugs prescribed from the National Essential Drug List	-----	Not available

was nearly same as the ideal WHO value 20-26.8% and 15-25% antibiotics prescriptions are expected in the developing countries due to the prevalence of common infectious diseases.¹⁷ The current study shows that the percentage of drugs prescribed by their generic names were 0%. The data reported about the prescription of drugs with generic names 23% in Nepal.¹⁸ All drugs should be prescribed by their generic names to decrease cost of therapy as well as to avoid confusion in filling the prescription. The number of medications prescribed from the WHO EDL were 49.92% (n=845) and it was higher from the finding of Joshi et al.¹⁸ which was 41.76% but lower than the WHO recommended value which is 100%. Higher the assurance of EDL greater will be the rational prescription as it meets all the basic requirements of the health care. NEDL was not found in this study.

The current study has observed the practices of omitting necessary information in the prescription writing process like absence of strength of drugs 211(36.89%), illegible hand writing 267(46.68%), frequency of drugs not mentioned 68(8.39%) and improper abbreviations 46(8.04%) were recorded. Such prescription writing errors were found more than in the study of Joshi et al.¹⁹ and Sapkota et

al.¹² It has been observed that any information regarding drugs in prescription writing process if miss may lead to serious health problems. In this piece of research study, we observed 703 decision errors including 703 (49.86%) drug-drug interactions. It has been reported in the literature that the lack of hospital pharmacist so ignoring drug-drug interactions may affect the disease therapy and causes serious health injuries.¹² It is suggested that a "Medication Review Team"¹⁹ consisting of pharmacists and physicians throughout the country should be constituted to describe necessary measures and proper recommendations for rational use of medications at primary health care system.

LIMITATIONS OF THE STUDY

Only a single hospital is selected for the current study and only 200 prescriptions were investigated over a period of two months.

CONCLUSION

Illegible hand writing, absence of strength of drugs, no mentioning of frequency of drugs and improper abbreviations were main types of prescription errors while error in drug-drug interactions was the main decision error in our study.

The results of this research study shows that the defined parameters of the WHO regarding prescription writing are not properly followed in the said hospital and most of the parameters were observed beyond the defined values of the WHO, consequently these may lead to irrational drug usages and hence affects the treatment process and enhances cost of therapy, ultimately increases hospitalization period and deteriorated health of the patients.

It is recommended that a large scale research work should be carried out for further investigations in other tertiary and secondary care hospitals of Pakistan. It is further recommended that the health department should hire clinical and hospital pharmacists and a medication review team comprising of physicians and pharmacists should be constituted in each health setup for the proper applications and administrations of medications under defined parameters.

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TABLE III: FREQUENCY OF PRESCRIPTION & DECISION ERRORS

Prescription Errors		Frequency	%age
Types of errors (n=572)	Absence of strength of drugs	211	36.89
	Illegible hand writing	267	46.68
	Frequency of drugs not mentioned	48	8.39
	Improper abbreviations	46	8.04
Decision errors in 1410 prescriptions	Drug-drug interactions	703	49.86
	Therapeutic duplications	0	0

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under:

HH: Concept & study design, acquisition, analysis & interpretation of data, drafting the manuscript, critical review, final approval of the version to be published

KAS: Acquisition, analysis & interpretation of data, drafting the manuscript, critical review, final approval of the version to be published

Ki, SA, AK, AU, AA: Acquisition of data, drafting the manuscript, final approval of the version to be published

Authors agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

CONFLICT OF INTEREST

Authors declared no conflict of interest

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