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EVALUATION OF MEDICATION ERRORS AND MANAGEMENT OF HIGH ALERT MEDICATIONS: A PROSPECTIVE OBSERVATIONAL STUDY.

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ABSTRACT

Objectives: The objective of the current study is to reduce the number of prescribing, transcribing, dispensing, administering and documentation errors. To educate health care professionals regarding high alert medications and to standardize care process: double sign and double check at the time of dispensing and administration. **Methods:** A Prospective observational study was conducted in all the departments at a tertiary care hospital, North India. The case sheets of patients were reviewed on a daily basis and observed for any medication errors. The staffs were educated on the importance of proper use of medications. **Result:** During the study period of 4 months, 1000 prescriptions were examined, out of which 216 medication errors were found. Among them, administration errors (26.8%), dispensing errors (14.8%), prescription errors (58.3%). Missed dose (72%) and incomplete prescription (51%) were the most common medication errors. **Conclusion:** Reducing the number of medication error is vital in order to prevent harm to patients. Development of proper awareness programmes to nurses and other healthcare professionals may help to reduce the frequency of errors. Clinical pharmacist plays an important role in the management of high alert medication errors (HAM).

KEYWORDS: HAM- high alert medications, MAR- Medication Assessment Record.

INTRODUCTION

Medications are promoted by health services throughout the world. However, substantial and increasing medication use can increase the risk of causing harm.

The U.S National Coordinating Council for Medication Error Reporting and Prevention interprets a medication error as: "any preventable event that may cause or lead to inappropriate medication use or patient suffering while the medication is in the control of the health care professional, patient, or consumer. Such events may be related to professional experience, health care products, procedures, and systems, including prescribing, order communication, product labelling, packaging and nomenclature, compounding, dispensing, distribution, administration, education, monitoring and use".[1]

Approximately 30% of problems occurs during hospitalisation are related to medication errors.[2]

High alert medications are drugs that exhibit a heightened risk of causing significant patient harm when they are used in error. Although mistakes may or may not be common with these drugs, the consequences of an error are clearly more devastating to patients.[3,4] Medication errors can lead to adverse outcomes such as increased mortality, increased duration of hospitalization and increased medical expenses. Even though medication errors can be caused by all members of health care team, nursing medication errors are the most common. Medication errors can seriously affect patient safety and treatment costs and result in hazards for patients and their families.[5]

The causes of these types of errors are usually detectable and can be corrected before the error reoccurs. Insufficient patient information (unaware about patient's allergies, self-medications, previous diagnoses and lab results for example), unavailable drug information (such as lack of up-to date warnings), miscommunication of drugs orders, which can involve unreadable handwriting, uncertainty between drugs with similar names, misuse of zeroes and decimal points, confusion of metric and other dosing units, and inappropriate abbreviations.[5,6]

MATERIALS AND METHODS

A Prospective observational study was conducted in all the departments at a tertiary care hospital, North India, for a period of 4 months. The case sheets of patients were reviewed on a daily basis and observed for any medication errors. The staffs were educated on the importance of proper use of medications.

Inclusion criteria: Medication errors which is reported

in hospital for inpatients. High alert medication error was as per pharmacy and therapeutic committee approved high alert medication list of organization. Errors reported by the pharmacy, nursing, doctors and clinical pharmacist during daily ward rounds were taken for the study.

Exclusion criteria: Outpatient department errors were not considered for the study as well as children below the age of 6 years.

Data collection process: The patient's case sheets were randomly selected and the medication assessment records (MAR) were observed on a daily basis. Any suspected medication errors were reported and justification for the respective errors was taken from the respective nurses and other staffs.

High alert medications: while all medications can cause harm, a selective group of drugs called High Risk Medications (HRM), carries a potentially higher risk of patient injury. Harm can be serious when they are misused, when they are not properly administered. Special caution should be taken while handling such medications.

All the patients receiving high alert medications were separately audited for proper storage, double sign and proper labels.

The MAR sheets were cross analysed against the medications at the patient bed side as well as the indenting list of corresponding patients and observed for any administration, dispensing or indenting errors. In order to identify the administration errors, the medications were counted as per the signs in the MAR sheet and observed for any missed dose, wrong route, wrong medication or wrong dose. To spot dispensing errors which includes delay in dispensing, wrong medication, incorrect dose, the indenting list was cross checked and reported to the concerned officials.

Prescribing errors were errors made from the resident medical officer (RMO) which included transcription errors, illegible prescriptions, overwriting, repeatedly writing the same medication which leads to drug duplication.

Need of The Study: Phase 1: Identification of The Problem

The data of medication errors namely prescription, dispensing, administration errors were collected during the month of February 2019 -March 2019. Analysed the errors and developed strategies to improve medication process.

Phase 11: Problem Monitoring

The data of medication errors for the month of April 2019-May 2019 was collected and analysed. And the reduction in the frequency of errors was observed.

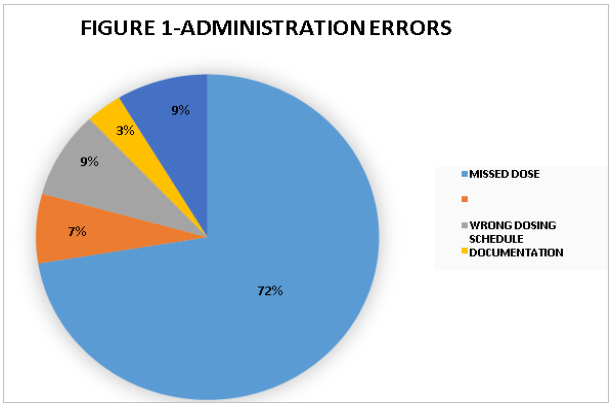
RESULT

During the study period of 4 months, 1000 prescriptions were collected from 1000 patients and analysed for medication errors. Among them, 216 medication errors were identified. Majority of patients involved with medication errors were male patients 118(54.6%) and 98(45.3%) were female patients. Distribution of medication errors according to the age group were 22(10.1%) in the age group 6-30 years, 80(37.03%) in the age group 30-50 years followed by 71(32.9%) in the age group 50-70 years and 43(20%) in the age group >70. Out of 216 medication errors, 58(26.8%) were administration errors, 32(14.8%) were dispensing errors, 126(58.3) were prescription errors shown in Table: 1.

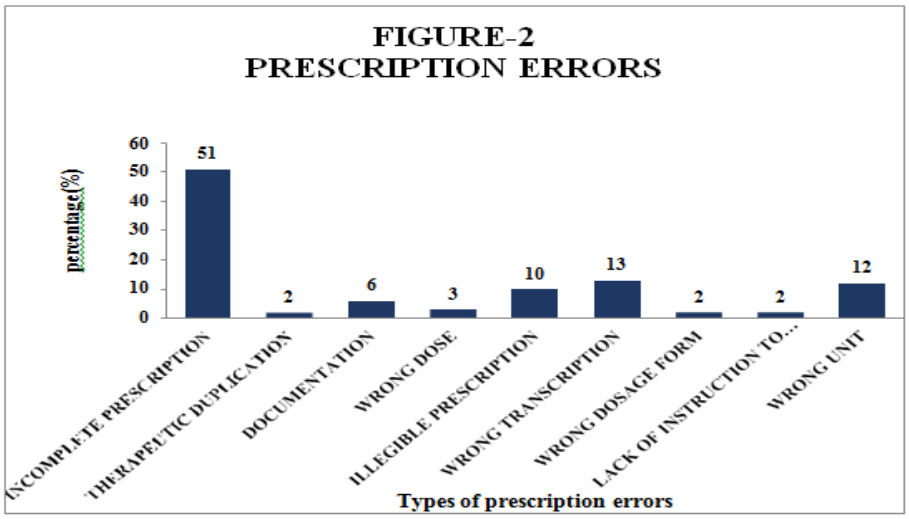
Table No 1: Trend Of Reduction In Medication Errors For 3months.

Sl. No:	Types of errors	Frequency (%)	February - March	April-May
1	Administration error	58(26.8)	42	16
2	Dispensing errors	32(14.8)	26	6
3	Prescription errors	126(58.3)	68	58

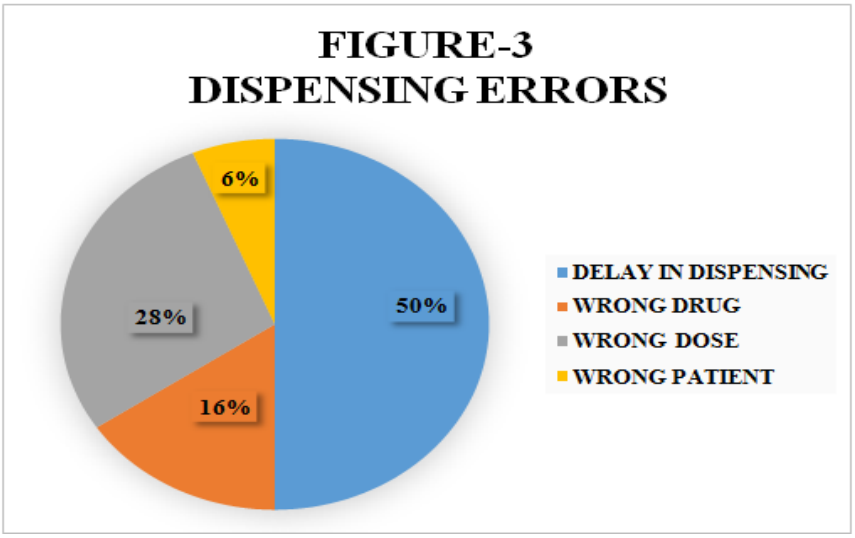
216 medication errors were identified, among these errors, 42(72.4%) -missed dose, 5(8.6%) - wrong dosing schedule, 4(6.8%) - drug overdose, 5 (8.6%) - wrong dose and documentation error 2(3.4%) as shown in FIGURE-1.



Among 216 medication errors, 126 prescription errors were observed of which incomplete prescription 64(51%), and transcription errors 16(13%) were the most common as shown in FIGURE-2.



32 dispensing errors were identified among 216 medication errors, out of which the most common errors were delay in dispensing 16(50%), wrong dose 9(28%). Details are shown in FIGURE-3.



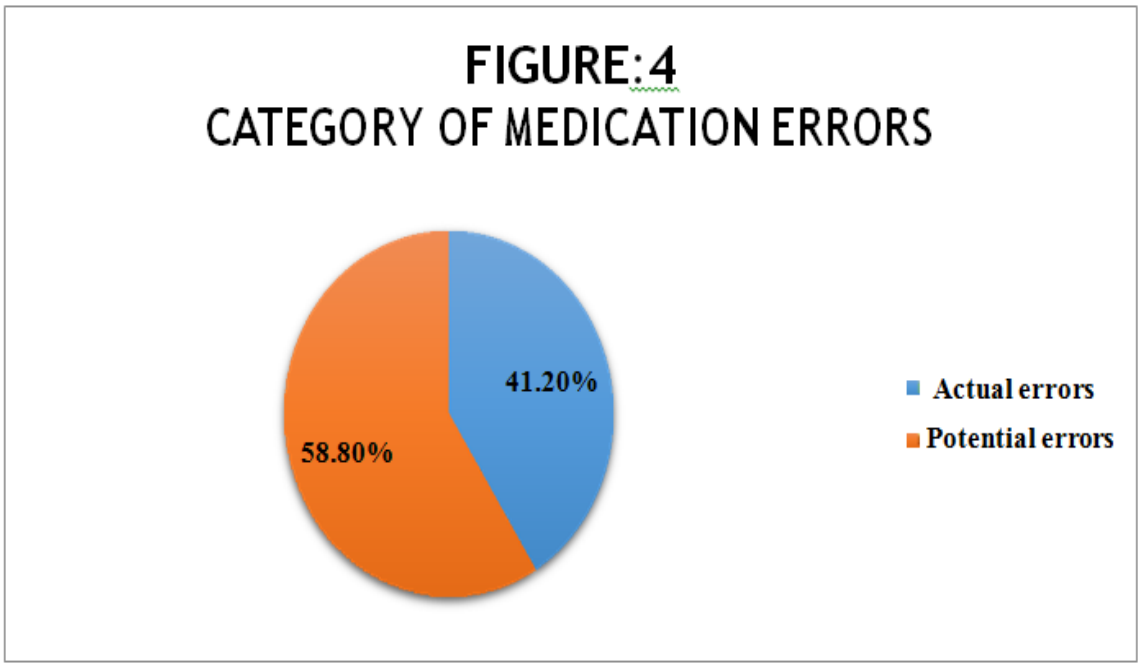
The frequent class of drugs involved in medication errors were antibiotics -20(9.6%), antihypertensives-16(7.7%), NSAIDS- 14(6.7%), CNS drugs- 13(6.28%). Anti-diabetic 9(4.34) and anticancer agents 1(0.48) are high alert medications, and management of such medications are very important, details are shown in TABLE: 2

Table 2.

SL. NO	Medication class	Frequency (%)
1	Antibiotics	22(17.9)
2	Antihypertensive	19(15.4)
3	NSAIDS	18(14.6)
4	CNS drugs	13(10.6)
5	Anti-diabetic	12(9.8)
6	Diuretics	8(6.5)
7	Antiulcer	7(5.7)
8	Anti-seizure	6(2.89)
9	Antihistamine	5(4.9)
10	Anticoagulant	5(4.9)
11	Corticosteroid	4(3.2)
12	Antifungal	2(1.6)
13	Anticancer	2(1.6)
	Total	123(56.9)

Medication errors were also categorised according to its harm, out of 216 medication errors identified, 89(41.2%)- Actual errors (errors that reach the patient) and 127(58.8%)- Potential errors (errors that did not reach the patient) as shown in FIGURE:4

Category of Medication Errors



DISCUSSION

The goal of medication use is to achieve defined therapeutic outcomes with improvement of quality of life and minimise patient risk. Medication errors are more prevalent in developing countries due to lack of good healthcare system and lack of health care professionals for each patient. Errors can occur at any spectrum of medication use from prescribing, dispensing and administration of drug. They are not individual generated rather they are system generated.

Among 1000 prescriptions, 216 medication errors were observed. Missed dose (72%) and delay in dispensing (50%), incomplete prescription (51%) were the common types of errors identified. The results of this study were similar to a research carried out by Armin Eisa-Zaei *et al.*,[1]

Administration errors were the most common type of error followed by dispensing errors. By taking the case files during the administration of medicines to the patient bed side, such errors can be reduced.

Errors due to high alert medicines can be more severe and in some cases it can be life threatening. So to avoid such harms precautions should be taken and proper training regarding the high alert medications should be given to the nurses.

The Institute for Safe Medication Practises (ISMP) medication safety self-assessment for high alert medications is designed to

- Heighten health care providers awareness of critical safe medication systems and practices associated with HRM.
- Assist health care providers with identifying and prioritizing opportunities for reducing patient harm when prescribing, preparing, dispensing and administering HRMs.[7]

Strategies implemented for HRMs

- High risk medications require independent dual clinician verification before administration.
- "High alert" stickers should be used to highlight HRMs.
- It should be stored separately from other medications.
- HAMs should be underlined in red and should be double signed in the medication assessment record.[8]

CONCLUSION

Reducing the number of medication error is vital in order to prevent harm to patients. Development of proper awareness programmes to nurses and other healthcare professionals may help to reduce the frequency of errors. Clinical pharmacist plays an important role in the management of high alert medication errors.

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