

Evaluation of Prevalence of Medication Errors in a Multispecialty Teaching Hospital, Dehradun (Uttarakhand), India.

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ABSTRACT

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Background: Medication errors are serious problems in health care and can be a source of significant morbidity and mortality in the health care settings. Medication error is recognized as the eighth leading cause of death. **Objective:** The study was proposed to evaluate the prevalence and types of medication errors in IPD (In-patient department) at multispecialty teaching hospital of Dehradun (Uttarakhand). **Materials and method:** This cross sectional and prospective study was carried out on 250 patients admitted in different wards of hospital. **Result:** The results of the present study revealed that among the prescribing errors, complete instructions to the patients regarding the use and side effects of drugs were not mentioned in any prescription (100%). Other major prescribing errors were absence of weight of patients (100%), registration number of prescribers (100%), allergic specification (100%), poor handwriting (74.4%) and use of abbreviations (100%). Maximum errors while dispensing were, failure to educate the patient regarding the use of medication (90%) followed by substitution and short supply of medicines (48%). Maximum causes of errors as perceived by interviewing the nurses were when they are distracted by other patients, coworkers or events on the unit (74%) followed by confusion between two drugs with similar names (72%). **Conclusion:** Medication error can occur anywhere in the healthcare system from prescriber to dispenser to administrator and finally to patients use. Thus reporting and prevention of medication error has become an important part because therapeutic outcome of drug therapy increase with reduction of medication error incidences which will, ultimately improve the quality of patient's life.

Keywords: Medication errors, Prescription, Dispensing.

INTRODUCTION

Medication use in hospitals is a complex process and depends on successful interaction among health care professionals functioning at different areas.¹ Medication errors are a common occurrence and continue to be a problem in the health care industry.²

Approximately, 28% of adverse drug events (ADEs) are related to medication errors and are, therefore, judged to be preventable.³

The National Coordinating Council for Medication Error and Prevention defines a medication error as "any preventable event that may cause or lead to inappropriate medication use or patient harm, while the medication is in the control of the health care professional, patient, or consumer."³ Such events may be related to professional practice, health care products, procedures, and systems including: prescribing; order communication; product labeling, packaging and nomenclature; compounding; dispensing; distribution; administration; education; monitoring; and use.⁴

A medication error not only constitutes cases of wrong medication, but also other forms of negligence committed by doctors and medical professionals. Mistakes that may lead to prescription errors include prescribing too much of a medication, not considering the weight and age of a patient, and disregard of allergies or other complications that may affect the patient's health while taking the medication. Medication errors can occur in pharmacies, hospitals, doctor's offices, nursing homes, and in the home and are one of the most easily traceable forms of medical malpractice.⁵

Factors that may contribute to the increased risk of medication errors are those with serious health conditions, older patients, pediatrics, those taking multiple medications, those using high risk medicines and those being transferred between community and hospital care. Poor communication is the most common factor reported that contributed to medication errors.

In Indian scenario, a proper reporting of medication errors in the hospital is not available. The fast growing rates of medication errors all over the world decides the need for starting a routine prescription auditing in all the multispecialty and tertiary healthcare centers in India. The present study was designed to evaluate the causes/ reasons of errors during various stages of prescribing and dispensing and also to find out the perception of nursing staff regarding the likelihood of medication errors in hospital admitted patients.⁶

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MATERIALS AND METHODS

The study was conducted at 700 bedded multi specialty teaching hospital, Dehradun (Uttarakhand). This cross sectional and prospective study was carried out on 250 patients admitted in different wards of hospital. The study was approved by Institutional Ethics Committee, Shri Guru Ram Rai Institute of Technology and Science, Dehradun.

A suitably designed questionnaire (**Appendix-A**) was used to analyze the types, frequency and factors responsible for medication administration errors and the data was collected from the case reports, treatment charts, medication administration records and by interviewing the in-patients admitted to various wards, and nursing staff. Demographic details of the patients, diagnosis and treatment recommended were documented. Causes of error due to prescribing and dispensing and perception of nursing staff about the medication error were recorded.

The information related to the patient's demographic details like patient's name, age, sex, address and patient I.D. number, occupation, allergic history, social habits were recorded. The prescriber's information included name, date, signature, superscription and registration number.

The information related to drugs included name of drug, strength (brand/generic), dosage form, quantity, dose, frequency, route of administration and direction for administration. All the collected data were analyzed and evaluated to determine the types, frequency and factors responsible for medication administration errors.

Analysis parameters were date of prescription, age, weight, sex and address of patient; superscription, name, registration number and signature of prescriber; dosage form, quantity, frequency and route of administration.

All patients admitted in different wards of the hospital were included in the study, whereas the patients treated on outpatient basis, patients under critical condition requiring critical care stay and children under the age group of five were excluded from the study.

RESULTS AND DISCUSSION

During the study period (April-June), total 250 prescriptions were studied. The results of the study revealed that in all the prescriptions studied during study period, medication errors were observed.

In the study, maximum patients were between the age group of 60-69 yrs. (19.60%) followed by 70-79 yrs. (18.62%) of age, which indicates that high prevalence of medication errors in older adults results on one hand from accumulation of factors that contribute to medication errors in all age groups, such as polypharmacy, polymorbidity, enrolment in several

disease-management programmes and fragmentation of care.

On evaluation of prescribing errors from the collected data, it was found that complete instructions to the patients regarding the use and side effects of drugs were not mentioned in any prescription (100%). Another major prescribing errors were absence of weight of patients (100%) and registration number of prescribers (100%), which indicated that while prescribing drugs, weight of the patient was not considered and lack of registration number indicated that, whether registered prescriber is prescribing the drugs or not. Other prescribing errors were lack of allergic specification on the prescriptions (100%) that may results in severe hypersensitivity reaction to the patients, if they are allergic to particular drug followed by use of abbreviation in all the prescriptions (100%) studied which often results in wrong interpretation of abbreviation by the pharmacists or nurses. Abbreviations or acronyms can stand for more than one word and therefore can be misinterpreted. Illegible handwriting (72.54%) was found to be another important reason for occurrence of medication error that may lead to dispensing of wrong drug to wrong patient. (Table-1)

Among the errors related to dispensing (Table-2), maximum errors were related to the lack of providing education to the patients regarding their disease and treatment (90%). As educating the patients is the key point for the success of their treatment and knowledge of patients about their disease and treatment will enhance the quality of their life. Other dispensing errors were substitution and short supply of medicine (48%) followed by improper drug preparation and incomplete or no drug information (21.2%).

In the present study, 43 nurses were also interviewed by asking few questions related to occurrence of medication errors in the wards and data was collected and evaluated (Table-3).

Findings reveal that there are differences in the perceptions of nurses about the causes and reporting of medication errors. According to them, maximum errors occurred when nurses are distracted by other patients, coworkers, or events on the units (74%) followed by errors occur when there is confusion between two drugs with the similar name (72%) and when nurses are tired and exhausted (67%). Only 41% nurses believed that all drug errors are reported, and reasons for not reporting medication errors are fear of management and peer reactions.

CONCLUSION

Medication errors are an unfortunate part of the health care delivery system. Health care provider's attitude must change in the approach to prevention of these errors. Patient education is an important aspect of any program to prevent medication misadventures. Organizations such as ISMP

| S. No. | Parameters | Mention (%) | Not Mention (%) |
|--------|---|-------------|-----------------|
| 1 | Direction | 76(74.50%) | 26(25.50%) |
| 2 | Strength | 88(86.27%) | 14(13.73%) |
| 3 | Signature | 86(84.31%) | 16(15.69%) |
| 4 | Superscription | 56(54.90%) | 46(45.10%) |
| 5 | Age/Name | 102(100%) | Nil |
| 6 | Weight | Nil | 102(100%) |
| 7 | Registration number | Nil | 102(100%) |
| 8 | Prescribed two drug at the same time | 16(15.68%) | 86(84.32%) |
| 9 | Poor hand writing | 28(27.45%) | 74(72.54%) |
| 10 | Reaction with allergy but without allergic speciation | Nil | 102(100%) |
| 11 | Date | 102(100%) | Nil |
| 12 | mg/kg calculation | Nil | 102(100%) |
| 13 | Use of abbreviation | 102(100%) | Nil |
| 14 | Inappropriate use of decimal | 102(100%) | Nil |
| 15 | Complete instructions to the patients | Nil | 102(100%) |
| 16 | Route of administration | 80(78.43%) | 22 (21.56%) |
| 17 | Prescribing a drug without informing patients its use and side effect | Nil | 102(100%) |

| S. No. | Parameters | Yes(%) | No(%) |
|--------|---|------------|------------|
| 1. | Inaccurate Directions for the Use of Medication | 22(21.56%) | 80(78.44%) |
| 2. | Failure to Educate the Patients Regarding the Use of Medication | 92(90.19%) | 10(9.80%) |
| 3. | Dispensing an Expired Medication | Nil | 102(100%) |
| 4. | Availability of Current Drug References | 102(100%) | Nil |
| 5. | Short/Expired Drug Dispensed | 9(8.82%) | 93(91.17%) |
| 6. | Short Supply of Medicines | 49(48.03%) | 53(51.97%) |
| 7. | Substitution /Dispensing Product Not Available | 49(48.03%) | 53(51.97%) |

| S. No. | Medication Errors | Number of Nurses (N=43) | % |
|--------|---|-------------------------|-----|
| 1 | Drug errors occur when the nurse fails to check the patient's name with the Medication Administration Record (MAR.) | 12 | 28% |
| 2 | Drug errors occur when the physician's writing on the doctor's order form is difficult to read or illegible | 29 | 67% |
| 3 | Drug errors occur when the medication labels/packaging are of poor quality or damaged | 8 | 19% |
| 4 | Drug errors occur when there is confusion between two drugs with similar names | 31 | 72% |
| 5 | Drug errors occur when the physician prescribes the wrong dose | 5 | 12% |
| 6 | Drug errors occur when the nurse miscalculates the dose | 12 | 28% |
| 7 | Drug errors occur when the nurse sets up or adjusts an infusion device incorrectly | 8 | 19% |
| 8 | Drug errors occur when nurses are confused by the different types and functions of infusion devices | 5 | 12% |
| 9 | Drug errors occur when nurses are distracted by other patients, coworkers or events on the unit | 32 | 74% |
| 10 | Drug errors occur when nurses are tired and exhausted | 29 | 67% |

(Institute for Safe Medication Practice), USP and FDA, as well as individual managed care organizations can help to evaluate the cause of medication errors. The collection of error data and analysis in the health care delivery process will minimize the risk of medication errors and improve patient safety.

Medication errors may be caused by the high number of prescriptions and the limited number of pharmacists. Incomplete or no drug information to the patient can cause discrepancies between the doctor's prescription and what the patient takes in actual practice. The impact of medications misuse because of these discrepancies can lead to morbidity and mortality. To avoid the medications misuse, the pharmacists should give information and education to the patients until they understand the role of medications in their health.

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(Appendix-A)

QUESTIONNAIRE

MEDICATION ERROR

Detail of Patients -

- Name :
- Age :
- Sex:
- I.D NO:
- Body wt:
- Drug Allergic : Not known Yes, allergic to
- Social history: Occupation: Business Service Other
- Smoking history: Y N
- Alcohol consumption: Y N

Detail of Prescriber: Name:

Qualification//Specialty:

Reg. no.:

Detail of Nursing Staff:

- Name:
- Job Title:
- Staff status T/P :
- Nursing experience.
- Work load (8hr working):
- Day shift/Night shift :
- Updating knowledge of staff (Have a current drug reference available):

Drug Related Information:

| Sl. no | Drug | Brand Name | Generic Name | Dose | Route of Administration | Frequency |
|--------|------|------------|--------------|------|-------------------------|-----------|
| | | | | | | |
| | | | | | | |
| | | | | | | |

Causes of Errors: Due to Prescribing:

| Error due to | Yes | No |
|--|-----|----|
| Direction mention | | |
| Strength mention | | |
| Signature mention | | |
| Reaction with allergy but without allergic specification | | |
| Prescribed two drug at the same time | | |
| Poor handwriting | | |
| Date absent | | |
| Wrong indication | | |

| Error due to | Yes | NO |
|---|-----|----|
| No mg/kg calculation | | |
| Direction incomplete/not legible | | |
| Use of abbreviation | | |
| Inappropriate use of decimal | | |
| Age/Name/Wt. mention | | |
| Complete instruction to patients | | |
| Wrong route of administration | | |
| Prescribing a drug without informing the patients , its use and side effect | | |

Causes of Errors: Due to Dispensing:

- Dispensing the wrong drug
- Dispensing the wrong dose
- Inaccurate directions for use of medications
- Failure to educate patient regarding the use of medication
- Dispensing an expired medication
- Failure to assess, review the patient medication profile
- Dispensing without knowing patient allergic history
- Dispensing without knowing patient conditions, and medical history (such as why the drug is prescribed)
- Have a current drug reference available
- More than one month supply given
- Substitution/Dispensing product not available
- Short supply of medicine
- Staff knowledge about medication
- Incorrect Label
- Short/Expired drug dispensed
- Wrong concentration dispensed

NURSE PERCEPTION OF MEDICATION ERROR:

The following statements are all possible causes of medication errors. Please read them carefully and tick the possible cause of error (Y/N)

- A. Drug errors occur when the nurse fails to check the patient's name with the Medication Administration Record (MAR.) Y/N
- B. Drug errors occur when the physician's writing on the doctor's order form is difficult to read or illegible. Y/N
- C. Drug errors occur when the medication labels/packaging are of poor quality or damaged. Y/N
- D. Drug errors occur when there is confusion between two drugs with similar names. Y/N
- E. Drug errors occur when the physician prescribes the wrong dose. Y/N
- F. Drug errors occur when the nurse miscalculates the dose. Y/N
- G. Drug errors occur when the nurse sets up or adjusts an infusion device incorrectly. Y/N
- H. Drug errors occur when nurses are confused by the different types and functions of infusion devices. Y/N
- I. Drug errors occur when nurses are distracted by other patients, coworkers or events on the unit. Y/N
- J. Drug errors occur when nurses are tired and exhausted. Y/N