



IJPPR

INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals

ISSN 2349-7203



Human Journals

Review Article

January 2015 Vol.:2, Issue:2

© All rights are reserved by Chidananda K N et al.

Medication Error: A Preventable Error

	
Chidananda K N^{2*}, K Jagadeesh¹, Sreenivas P Revankar³	
<i>1 Professor and HOD, Department Of Pharmacology, Shivamogga Institute Of Medical Sciences, Shivamogga, Karnataka, India.</i>	
<i>2 Postgraduate student, Department Of Pharmacology, Shivamogga Institute Of Medical Sciences, Shivamogga, Karnataka, India.</i>	
<i>3 Assistant Professor, Department Of Pharmacology, Shivamogga Institute Of Medical Sciences, Shivamogga, Karnataka, India.</i>	
Submission:	29 December 2014
Accepted:	10 January 2015
Published:	25 January 2015

Keywords: Medication Misadventure, Adverse Drug Reaction, Medication Errors, Healthcare Professional

ABSTRACT

The main purpose of the medication use is for the treating the disease of an individual and for the maintenance optimum health. In the process of medicine use there are many levels at which their chances for the error to occur. The untoward incidents or hazards that result from such an error has been defined as medication misadventure, which includes both adverse drug reactions (ADRs) and medication errors. Medication Errors can occur due to several factors, from the level of manufacturer, physicians, pharmacists, nurses to level at patient. Medication error can lead to the individual's morbidity, by aggravating the disease, prolonging the duration of hospital stay and thereby increasing health care costs .If medication error is severe it can also lead to the death of the individual. It becomes the responsibility on the part of the health care system and health care professionals to identify medication errors occurring at different levels, make appropriate measures to avoid and minimize the occurrence of medication errors.



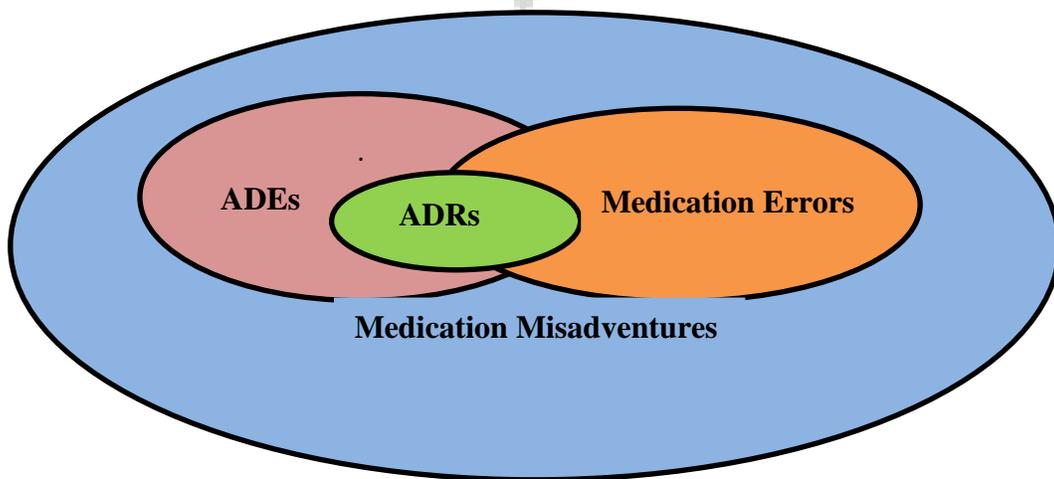
HUMAN JOURNALS

www.ijppr.humanjournals.com

INTRODUCTION

The main objective of the health care system and the health care professionals is to treat the disease of the individual and provide him the optimum health care. In this process there are many chances for the errors to occur, including from manufacturing of medicines to prescription, dispensing, administration / consumption of medicines. Hazards caused by these errors to the individual can be collectively called as Medication Misadventures.

Medication Misadventure is a broad term, may or may not cause injury to a patient. All Adverse Drug Events (ADEs), Adverse Drug Reactions (ADR's) and Medication Errors fall into the umbrella of Medication Misadventures.¹



Among the medication misadventures, medication error is the most important one which can be prevented if the appropriate measures are taken. **The National Coordinating Council For Medication Error Reporting And Prevention (NCC MERP)** defines medication errors as *“any preventable error that may cause or lead to inappropriate medication use or patient harm while the medication is in control of health care professional, practitioner, consumer. Such events may be related to professional practice, health care products, procedures and systems, including prescribing order, communication, product labeling, packaging, nomenclature, compounding, dispensing, distribution, administration, education, monitoring and use”*.²

Medication error can occur at any stage from formulation, manufacturing, packing and labeling of a drug at production level to at last but not least the patient compliance towards the drugs. As

medication error can occur at many stages, various prevalence has been provided by many researchers and evaluator's worldwide .UK's National Patient Safety Agency has reported that medication error occur in 50% of hospital administration of which 18% in dispensing and 16% in prescribing stage. More over the most serious incidents caused by medication error happens to be in administering stage (41%) and in prescribing stage (32%). The US Agency of Health Care and Research Quality (AHRQ) has reported that 20% of Medication Misadventures which lead to death are from Medication Errors.³

The medication errors can be prevented if medication administered complies with the five rights. 1) Right patient 2) Right drug 3) Right Dose 4) Right Time 5) Right Route. These five rights also provide tool for the health care professionals to evaluate and prevent the occurrence of errors.

CLASSIFICATION OF MEDICATION ERRORS

It is very important to classify the medication errors because it provides the information where exactly the errors are happening and helps to develop the preventive measures to reduce the occurrence of errors.

I. Depending on the stage at which the Medication Error occurs

1) Manufacture Error: selecting the similar kind of packing, labeling material and similar names for a drug leads to medication error among the prescribers while prescribing, pharmacist while dispensing, nurses while drug administering and patients during consumption the medicines.

2) Prescribing Error: occurs at the stage where the clinicians prescribe the drug for the patient. The error may be in the form of incorrect drug selection for a patient, may be in the incorrect dose, dosage form, or route to be administered. It may also be in the failure to comply with the rules of prescription writing. The prescription should contain correct directions to the pharmacist regarding dispensing the drug, instructions to the nurses for drug administration and last but not least directions to the patient regarding consumption of the medicines.

3) Omission Error: Is said to be occurred if the patient does not receive the scheduled dose of the medicines.

- 4) **Wrong Time Error:** It is said to occur if the drug is not administered in accordance to the predetermined interval and may vary considerably among the different institutions.
- 5) **Un-Authorized Drug Error:** If the patient receive a drug that was not authorized by an appropriate prescriber.
- 6) **Improper Dose Error:** If the patient receives a dose of medicine which is different from that prescribed by the prescriber assuming that prescribed dose was appropriate.
- 7) **Wrong Dosage Form Error:** Occurs most commonly among the drugs which require reconstitution before administering, Such as administering various intravenous injections and dry syrups.
- 8) **Wrong Administration Technique:** If the patient receives the drug through inappropriate route. Example as when intravenous drug is given by intramuscular route.
- 9) **Deteriorated Drug Error:** This occurs when drugs are administered that have expired or deteriorated due to improper storage.
- 10) **Monitoring Error:** Occurs when patients are not monitored appropriately before or after administering particular drugs like warfarin.
- 11) **Compliance Error:** If patients use the medication inappropriately.⁴

II. Depending on the Severity or Outcome of the Medication Error

The NCC MERP has proposed a medication error index that categorizes the medication errors based on the severity or outcome of the severity. It is important for the institutions and hospitals to monitor the medication errors based on both the type of errors that occur at various stages and also severity and the outcomes associated with medication errors.⁵

1) No error

Category A: circumstances or events that have capacity to cause error.

2) Error No Harm

Category B: An error occur but the medication did not reach the patient.

Category C: An error occurred that reached the patient but did not cause the patient harm.

Category D: An error occurred that resulted in need for increase patient monitoring but caused no harm.

3) Error, Harm

Category E: An error occurred that resulted in the need for the treatment or intervention and caused temporary patient harm.

Category F: An error occurred that resulted in initial or prolonged hospitalization and caused temporary patient harm.

Category G: An error occurred that resulted in patient harm.

Category H: An error occurred that resulted in near death event. (eg. Anaphylaxis, Cardiac Arrest)

4) Error and Death

Category I: An error occurred resulting in the patient death.

III. Depending on the Professionals Involved⁶

Manufacturer

It's not surprise if we come across different drugs belonging to different class which sound and look alike. It is mainly because of existence of various manufacturing companies worldwide. There may exist two drugs which belonged to different class marketed by a similar or almost similar name and packages. A drug branded one country may belong to other class of drug in other country manufactured and marketed by different company. This may prone for committing error among the health care professionals.

Practitioner

The error occurring at the stage of prescription writing is called as prescribing error. Error at this stage is by incorrect drug selection in dose, dosage form, quantity, concentration, and route, rate of administration or instructions for use. Lack of legibility also makes the other health care professionals to think and make assumptions

Nurse

The errors which are more prone to occur by nurses are Omission Error, Wrong Time Error,

Improper Dose Error, Wrong Dosage Form Error, Wrong Administration Technique, Monitoring Error.

These error committed by them might be due to lack of knowledge, increased work demand or decreased communication among different health care professionals.

Pharmacist

Medication errors are also prone to occur by the pharmacist. The error occurring at this stage is called as the dispensing error. Failure to comply with the prescription given by prescriber leads to dispensing errors. Pharmacist with lack of good knowledge regarding the drugs, inappropriate working atmosphere and apparently look alike drugs and their nomenclature will lead to errors.

Drugs with lookalike packing are more prone for the dispensing errors.

Patients

Medication errors can also occur by the patient or his attendants, when they do not comply with the prescription prescribed by the physician. This error can be reduced effectively by educating the individual regarding the medicines they consume.

Factors Responsible for Medication Errors⁷

1) Environmental Factors: As the health care systems involves many professionals working at different levels. Inappropriate environmental conditions such as low lighting, high level of noise, stress may lead to medication errors.

2) Excessive Task Demand: At the level of prescribing, dispensing or at level of administering the medicines to the patients excessive work burden will always lead to medication errors.

3) Personnel Factors: Personal factors such as age, sensory deficits, or state of health of the health care professional may also contribute to the medication errors.

4) Extra Organizational Factors: Factors such as similar product names or packaging may also lead to the medication errors at different levels in the health care system

5) Intra organizational Factors: Policies and procedures demanding high output and mandating long working duration may also lead to the medication errors by the professional health workers.

6) Interpersonal Factors: Conflicts between the coworkers and between the patients may distract the professional from the task at the hands and may lead to medication errors. It also involves lack of communication.

7) Lack of Knowledge: At any level the lack of knowledge of the medicines and procedures may lead to the medication errors. Placing an inexperienced graduate, non specialist covering a particular specialized area, nurses with lack of knowledge of pharmacology may lead to the medication errors.

8) Lack of Patient Counseling: Last safety check before dispensing the medicine would be talking to the patient. Talking of the pharmacist with the patients helps to correlate between the drug and the patient condition, lack of patient counseling may fail to reduce preventable medication errors.

Steps To Prevent Medication Errors:⁸

1) Patient communication: Communication of the health care professional with the patient will reduce the occurrence of the medication errors from the level of prescribing to the level of medicine administering. Practitioner should spend maximum time with the patient before diagnosing the condition. Pharmacist should communicate with patient before the drug is dispensed and try to correlate between the drug and patient's condition and nurses should also communicate with the patient before administering the drug.

2) Intra Professional Communication: Good communication between the healthcare professional would definitely reduce the occurrence of the medication errors, any factor of doubt during the process of medication use must be clarified, if a pharmacist get the doubts regarding the dispensing of drug and nurse during administering of drug should be clarified with the prescriber. At the same time, if the prescriber have a doubt regarding composition of any drug it should be clarified by the pharmacist. Similarly if the patients have doubts regarding use of any medicines, it should be clarified by the health care professionals.

3) Educating and Training: Lack of knowledge is one of the main contributor for the occurrence of the medication errors. The health care professionals must be educated about the recent updates and also hands on training should be given so that the occurrence of the errors can

be reduced or prevented. Educating the patient regarding use of medicine and maintaining compliance would also reduce the errors.

4) Reporting of Medication Errors: Health care professionals must be encouraged to report the medication errors which would help to recognize the step where the errors are occurring and would help to develop the measures to prevent or reduce the occurrence of errors.

5) Environmental Factors: Healthcare professionals must be provided with good working environment with adequate light, less noise, less stress and appropriate work load so that occurrence of the errors can be prevented or reduced.

6) Technology: Appropriate use of the technology would definitely reduce the medication errors. Health care professionals should be provided ready access to the patient data information, drug information; it would definitely reduce the medication errors. Automated dispensing instruments and also software that screens the drug-drug interaction and generating proper dosage can also reduce the occurrence of the medication error. Electronic prescribing would also reduce the medication errors. Barcoding of patient data is also another technology that would reduce the medication errors particularly at the stage of dispensing and administering of the medicines.

CONCLUSION

Medication error is one of the serious problems in healthcare system. Recognition of problem is an important first step in developing strategies to prevent the occurrence of the medication errors. Healthcare professionals from the prescriber to nurse must contribute in hands together to prevent or reduce the occurrence of the medication errors. Healthcare system should develop policies in which the main priorities should be to ensure the patient safety.

REFERENCES

- 1) Malone P M, Kier K L, Stanovich J E. Drug Information- A Guide To The Pharmacist: Medication Misadventures. 1st edition. New York: McGraw Hill publication; 2006. p 599-630
- 2) Bates D W. Preventing medication errors: A summary. Am J Health Syst Pharm. July 15, 2007; 64: p 3-9.
- 3) Mansouri A, Ahmadvand A, Hadjibabaie M, Kargar M, Javadi M, Gholami K. Types and severity of medication errors in Iran; a review of the current literature. DARU Journal of Pharmaceutical Sciences 2013, 21: 49. p 1-10.
- 4) Roy V, Gupta P, Srivastava S. Medication Errors : Causes & Prevention. Health Administrator. 19;(1): p 60-4
- 5) Usman M. Medication Errors; Time To Wake Up. KJMS 2011, 3: (2). p 51-2

- 6) Malhotra K, Goyal M, WaliaR,Aslam R. Medication Errors: A Preventable Problem.Indian Journal of Clinical Practice. June 2012: 2(1):p17-21.
- 7) Perwitasari D A*,Abror J U, Wahyuningsih I. Medication Errors In Outpatients OfA Government Hospital In Yogyakarta Indonesia.IJPSR.April 2010:1(1):p8-10.
- 8) GaurS,SinhaA K, SrivastavaB. Medication errors in medicine wards in a tertiary care teaching hospital of a hill state in India.Asian Journal of Pharmacy and Life Science. Jan-March,2012: 2 (1):p56-63.

