JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue
JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)
An International Scholarly Open Access, Peer-reviewed, Refereed Journal

Medication errors: A challenge to pharmacovigilance

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Abstract

Pharmacovigilance is an activity contributing to the protection of health of public. There are many adverse reaction which are due to the special situations like overdose, misuse, accidental drug exposure, off label use and medication errors. Medication errors are found to be difficult for tracking and also these are creating the challenges for pharmacovigilance. Drugs are need to be used as per the given label or company core data sheet to show maximum effect. Many factors like patient education, dispensing and prescription errors contribute for the medication errors which may affect patient compliance. Many unexpected therapeutic benefits have been reported by the patients and health care professional due to medication errors. This will help in research for different pharmacological actions of existing marketed formulations. An effort has been made in this review to collect information about different types of medication errors and the challenge associated with it for pharmacovigilance. Also effort has been made for the effective use of medicines as per label and to improve patient compliance. Data from different websites and published articles has been collected and summary of these articles has been written. From this review it has been concluded that by patient education we can reduce the chances of medication errors.

Keywords: Off label use, misuse, overdose, patient education.

Introduction

A medication error is an unintended failure in the drug treatment process that leads to or has the potential to lead to harm to the patient. As medication errors are unintended failure in drug treatment these should not be confused with lack of drug effect. Lack of drug effects are due to drugs inability to produce its desired effect in spite of use of drug as per stated label or company core data sheet (CCDS). Medication errors are human or process mediated failure in therapeutic efficacy of drug. occurance of medication error can be at any stage of medication use systems like in preparation,prescription,transcrfiption,dispensing,preparatiopn for administration or storing remedial products.[1] An adverse event is 'any untoward medical occurence in a patient .it is an combo of deformities..[2] Sometimes potential medication

error will be identified before reaching the medicine to the patient by the dispensing personnel, these types of medication errors are reported as intercepted medication errors.[3] In this review we summarized the types of medication errors, its effect on pharmacovigilance and patient compliance. Some methods to improve patient compliance have been discussed.

Types of medication errors

Medication errors can occur in:[4]

- Selection of a medicine—irrational, inappropriate, and ineffective prescribing, under prescribing and overprescribing;
- Prescription writing —prescription errors, including illegibility;
- Manufacturing the formulation —wrong strength, contaminants or adulterants, wrong or misleading packaging;
- Dispensing of formulation—wrong drug, wrong formulation, wrong label;
- Drug administration—wrong dose, wrong route, wrong frequency, wrong duration;
- Monitoring the therapy—failing to alter therapy when required, erroneous alteration.

there is an involvement of 3 people's .they are the doctors who prescribe medicine, the pharmacist who supply medicine nd the nurse who gives medicine. any mistake occurred by doc, nurse or pharmacist leads to medication error,therefore, there are three main types of medication errors they are :prescribing error, dispensing error and administering error .[5]

• **Prescribing Error:** t this error is based on indication contraindication known allergies, existing drug therapy, dose,dosage form ,route of administration, rate of administration..

• **Omission error:** this error is associated with the failure of dose or drug administration to patient before the next scedule dose or failure to prescribe the indication dose to patient

• **Wrong time error:** Administration of medication or drug dose at an appropraite time or the prescribed time

• **Dose error:** Dispensing or administration to the patient of a dose that is greater than or less than the amount ordered by the prescriber or administration of multiple doses to the patient, i.e. one or more dosage units in addition to those that were ordered.

• **Dosage form error:** Dispensing or administration to the patient of a drug product in a different dosage form than that ordered by the prescriber.

• **Drug preparation error:** Drug product incorrectly formulated or manipulated before dispensing or administration.

• **Route of administration error:** Wrong route of administration of the correct drug.

• **Administration technique error:** Inappropriate procedure or improper technique in the administration of a drug other than wrong route.

• **Deteriorated drug error:** Dispensing or administration of a drug that has expired or for which the physical or chemical dosage-form integrity has been compromised

• **Monitoring error:** Failure to review a prescribed regimen for appropriateness and detection of problems, or failure to use appropriate clinical or laboratory data for adequate assessment of patient response to prescribed therapy.

• **Compliance error:** Inappropriate patient behavior regarding adherence to a prescribed medication regimen.

• **Other medication error:** Any medication error that does not fall into one of the above predefined types

Factors that may influence medication errors:

Factors associated with health care professionals [6]

- ✓ Lack of therapeutic training
- ✓ Inadequate drug knowledge and experience
- ✓ Inadequate knowledge of the patient
- ✓ Inadequate perception of risk
- ✓ Overworked or fatigued health care professionals
- ✓ Physical and emotional health issues
- ✓ Poor communication between health care professional and with patients

Factors associated with patients [7]

- ✓ Patient characteristics (e.g., personality, literacy and language barriers)
- ✓ Complexity of clinical case, including multiple health conditions, polypharmacy and high-risk medications

Causes of medication errors [8]

Factors associated with the work environment

- ✓ Workload and time pressures
- ✓ Distractions and interruptions (by both primary care staff and patients)
- ✓ Lack of standardized protocols and procedures
- ✓ Insufficient resources
- ✓ Issues with the physical work environment (e.g., lighting, temperature and ventilation)

Factors associated with medicines

- ✓ Naming of medicines
- ✓ Labelling and packaging

Factors associated with tasks

- ✓ Repetitive systems for ordering, processing and authorization
- ✓ Patient monitoring (dependent on practice, patient, other health care settings, prescriber)

Factors associated with computerized information systems

- ✓ Difficult processes for generating first prescriptions (e.g. drug pick lists, default dose regimens and missed alerts)
- ✓ Difficult processes for generating correct repeat prescriptions
- ✓ Lack of accuracy of patient records
- ✓ Inadequate design that allows for human error Primary-secondary care interface
- ✓ Limited quality of communication with secondary care
- ✓ Little justification of secondary care recommendations

Medication errors and Pharmacovigilance

Detecting medication errors needs collaboration between various organizations, such as patient safety institutions, pharmacovigilance centres, and poison control centres. The duties of pharmacovigilance centres in preventing medication errors include informing health-care professionals about the importance of reporting such errors and creating a culture of patient safety. Pharmacovigilance centres aim to prevent medication errors in collaboration with poison control centres. Such collaboration allows improved detection and improved preventive strategies. Pharmacovigilance centres aim to prevent medication errors by disclosing information regarding the most frequent drug-related problems, through monthly information bulletins to healthcare professionals.[9]

Benefits of Pharmacovigilance of medication errors

Some countries have started to work on improving patient safety, by improvements to the yellow card forms, the use of root cause analysis, the establishment of specific databases for medication errors, retrospective analysis of such errors, prospective studies, actions to prevent medication errors, and seminars on medication errors. Half of the countries surveyed were interested in organizing seminars on preventing medication errors, and four of the countries had already conducted a root cause analysis and taken preventive actions. Pharmacovigilance of medication errors help in minimizing the medication errors and also reduces the risk associated with medication errors and adverse events associated with medication errors. This also helps in monitoring and avoiding possible medication errors. Pharmacovigilance helps by preventing adverse drug reactions and medication errors through educating healthcare professionals regarding medication error [9]

Barriers for Pharmacovigilance of medication error

Pharmacovigilance programme are going to face some challenges which will have impact on the health scenario of the country.

Health Professionals

Lack of continuing medical education about pharmacovigilance lead to underreporting of adverse drugs events. Most of the time, doctors report only if the adverse events has a casual relationship with the drug. Due to low ratio of doctor to patient, most of the events are not reported due to lack of time, low motivation, ignorance and lethargy. In spite, having trained medical professional, sometimes doctors are hesitant to report because they fear litigation and thinks reporting might go against them. Lack of training among undergraduates about pharmacovigilance.[10]

Self-Medication

Self-medication is one of the problems as people are not educated about drugs and they take drugs prescribed by pharmacist without proper prescription. Advertisements by the drug companies and the readily available over-the-counter drug with available pamphlets about the dose, indication, side-effects make the patients to take their own therapeutic decisions, without assistance from health care professionals. This leads to unknown adverse effects which usually goes unreported and may have bad impact on the society.[11]

Web-Based Medication

Web based information related to drugs and diseases without authenticity have posed a great challenge to the programme. It leads to the uncontrolled sale of medicines with drug information of varying degree with questionable safety, efficacy and quality.[12]

Counterfeit drugs

Counterfeit drugs are very important and underreported problem, particularly in developing countries. It causes morbidity, mortality, and loss of public confidence in medicines and health structures. The prevalence of counterfeit drugs appears to be rising and posed a greater challenge to pharmacovigilance. It has been to be opposed by close cooperation between drug companies, governments, or international organizations concerned with health sector in the developing countries.[13]

Traditional Medicines

Traditional drugs are considered safe with few side effects. The processing of natural drugs are not done properly, toxic and essential ingredients are not known most of the time, they are given for long duration and there is lack of knowledge between interaction of herbal drugs with modern medicines.[14]

Methods to avoid medication errors

The best way to understand how medication errors happen and how to avoid them is to consider their classification, which can be contextual, modal, or psychological. Contextual classification deals with the specific time, place, medicines and people involved. Modal classification examines the ways in which errors occur (for example, by omission, repetition or substitution). Psychological classification is to be preferred, as it explains events rather than merely describing them. Its disadvantage is that it concentrates on human rather than systems sources of errors.[15]

Over the years, hospitals have developed strategies to prevent medication errors. Some of these strategies include the following [16]

- Double-check the dosing and frequency of all high-alert medications. The Institute of Safe Medication Practices provides a list of high alert medications.
- If unsure about the drug or the dose, speak to the pharmacist.
- If the writing is illegible, do not give the medication believing that you think you know what it is. Call the healthcare provider to confirm the drug or dose.
- Recheck the calculation to ensure that the patient will get the right therapeutic dose.
- Ask another clinician to recheck your calculations

Conclusion

Pharmacovigilance plays an indispensable role in inhibiting and overcoming ADR-related problems. ADR-related monitoring and pharmacovigilance activities are still facing challenges if the ADR is related with medication errors. The use of any of the above methods to avoid medication errors can help prevent or reduce medication errors. It is important to remember that a medication error can result in life threatening diseases and can also lead to death of patients. Also, these errors can negatively affect the reputation of a healthcare facility. Pharmacovigilance of medication errors will be useful for patient education and also it is useful for health care professionals.

Future scope

Various strategies may be utilized to safeguard against medication errors such as patient and physician education, use of technology, and development of policies for high-risk medications. Optimization of this process involves learning from past events-medication errors.

Acknowledgement

Authors are thankful to the Dr. Salunkhe K. S., Principal, Sanjivani College of Pharmaceutical Education and Research and Prof. Patil D.N., Principal of Sanjivani Institute of Pharmacy and Research, Kopargaon for their guidance and support for the completion of this review work.

Conflict Of Interest:

Authors declares no conflict of interest.

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