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A prospective study on medication errors in an intensive care unit

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ABSTRACT
Introduction: Medication error is any preventable event that may cause harm to a patient is known as medication error. Errors happen due to the lack of knowledge, poor performance and psychological lapses. In this pharmacist has a major role along with physicians, nurses, and administrators to examine and improve health-care system in order to ensure the patient safety. **Objective**: The objective of the following study is to determine the frequency, causes and types of medication errors in the secondary care intensive care unit. **Methods**: All medical records of the intensive care unit patients, above 14 years of age, with co-morbid / non-co-morbid conditions and occupation, caste and gender were checked for medication errors for a period of 06 months at Government headquarters hospital, Udhagamandalam. **Results**: According to the results of this study 116 medication errors were found in 103 patients in the intensive care unit. The number of medication errors was higher in men than in women. The most common type of medication error was prescription error, which were illegible handwriting, the use of lookalike drugs and incomplete dose, dosage and frequency information. **Discussion and Conclusion**: Considering the results of this study, it is important to increase awareness among the health care professionals of various stature about the significance of medication errors. It is also necessary to change the existing prescribing techniques and clearly differentiate the lookalike drugs to avoid the medication errors.
Keywords: Error, Drugs, Prescription

INTRODUCTION

The term medication error can be described as incorrect / incorrect administration of a medication that occurs due to incorrect dosage or route of administration, failure to prescribe or administer the appropriate medication or formulation for a specific disease or condition, use of obsolete medicines, failure to follow the correct time to administer the medication or lack of knowledge of adverse effects. Causes of prescription errors include difficulty reading handwritten instructions, misunderstanding about different medications with similar names, and lack of knowledge about allergies or sensitivities to a patient's prescription. Drug error occurs when a patient is selected by a health care provider for an inadequate form of treatment. This is one of the main issues, and that the drug error is the first step towards patient health. In this clinical pharmacist, along with health care practitioners, will play a significant role in patient safety. Error in the drug can be considered as lethal as any disease.

Harvard University reported in the 2013 report that each year India reports a whopping 52 lakh accidents (out of the 430 lakhs worldwide) due to medical errors and adverse events (5 May 2016). The key explanation for this is the lack of interaction amongst health care professionals.

Drug error classification Drug error can be categorized as: (I) Prescription error (II) Interpretation/transcription error (III) Administration error (IV) Documentation error

1. Prescription Error: Error made by the doctor while prescribing can lead to some fatal errors, such as poor handwriting, incorrect spelling of medicines, incorrect dosage type, and no drug strength specified on prescription. For example, the drug name is correctly specified but without specifying the dosage type or frequency.

2. Transcription Error: It is a form of mistake created by the Nurses and Physicians when entering the specifics of the medication in the system or in the profile of the patient. Errors in this category include, double drug entry, no drug entry or drug entry that was not administered.

3. Administration Error: It is the most common mistake made by nursing staff during patient administration of the medications. Such errors include prescribing the medications to the wrong patient, incorrect prescription, wrong direction, incorrect dosage, wrong cause, wrong time, wrong duration, etc.

4. Documentation Error: Patient care nurses play a significant part. The recorded records of the prescription history of the patient are kept by the nurses, the mistake in reporting the details on the drug such as no recording of the drug, double entry of the medications or losing critical information when reporting is known as documentation errors.

Main cause of medication error is: Missing patient information, drug information, and miscommunication of drug order, lack of education of nurses, lack of drug details from the patient side, drug storage, illegible handwriting, wrong drug selection, drug interactions or improper training of nurse's etc[1].

The following features can prevent the medication error from being severe include:

a. Ensuring proper drug administration to the right patient, such as right medicine, dose, path and duration.

b. Follow proper reconciliation of the medication when moving a patient from one unit to another, verifying the appropriate drug, dose, path, time for appropriate patient against order of transfer.

c. The nurses who work in various time shifts will search twice or three times for the prescription orders.

d. Records and the documents should be properly preserved.

e. Proper medicinal stock.

f. Abbreviations are most likely to be avoided.

Types of Prescription Error:

Computerized Pharmacy Order Entry is a very helpful for doctors to insert medicine directly into a hospital's computer system that avoids weak handwriting to complete all vital details, it is capable of reducing the rate of medicine error. This will strengthen the efforts in contact during care transition. Doctors should be interested in tailoring the CPOE to ensure that it is both user friendly and unique to their medical ordering needs. [2,3] In addition to providing essential reminders and warnings, computerized decision support systems CDSS can improve the clinical performance related to prescribing practices. It includes a summary of the orders as they are issued, comparing new and current orders, scanning for potential drug reactions, correct dosing schedules, and alerting the physician to appropriate laboratory results, all of which affect the decisions of the physician and the patient care plan [4].

Pharmacist aided rounds ensure that medications are used rationally and cost-effectively, facilitate safe living, and enhance clinical outcomes by regularly participating in direct

patient care and partnering with other health care practitioners, thus reducing prescription errors. Handwriting Using CPOE can help remove handwriting errors that can result in the patient's adverse effects. By using CPOE we can correct from handwriting the abbreviation and drug, the dosage, the root frequency prevention. Abbreviations is one of the main causes of prescription drug mistake as the doctors prescribe the medicine. Therefore, to prevent the prescription mistake, we need to prevent product name abbreviation, doses etc. Whereas using the correct decimal point so the patient or caretaker may recognize to avoid the decimal point on the prescription. For example: write 0.1 mg drug instead of writing.1 mg better. Electronic order transcription with CPOE improves transcription speed and accuracy. Therefore, we can distinguish few prescription mistakes from this.[5] Mishearing was often using incorrect words or wrong terms due to poor listening. To prevent this form of mistake, pharmacist should be attentive to the doctors' orders. The physician's verbal instructions arise when the order is mistakenly interpreted. Security is the primary concept upon which verbal commands are recognized. Verbal directives have a greater potential for errors because such instructions may be misunderstood, misinterpreted and mistranscribed.[6] The patient's written documentation records are essential to the preparation and assessment of procedures and patient care. The written reports include the patient's medical history and drug history, the patient's course of treatment, care and reaction while under the health care provider's supervision [7]. Many of the good documentations can be reliable, complete, timely, truthful and structured. Patient information such as name, title and other information must be cross-checked with the medical record registry by the pharmacist or nurses before administration of the drug to the medical[12]. A pharmacist must verify the appropriate dosage, route and time written on the prescription before drug administration.[8] Drug reconciliation is a procedure to strengthen communication so that we can avoid the mistake by getting the patient's medication history and reconciling the medicine as soon as possible when the patient is admitted to hospital. In having the drug records, we will equate it with the hospital's discharge medicines. This is one of the best ways to prevent mistakes in recovery, such as when patients get their list of medications on hospital admission, the likelihood of errors and damage will decrease. Medication reconciliation strategy includes health care providers and patients that can minimize medication morbidity and mortality and is a vital factor for patient safety. [9, 10,11]

MATERIALS AND METHODS

The study was performed at Government Headquarters Hospital, Ooty for a span of six months as a prospective analysis involving purposeful sampling. The requirements for the research included all patients admitted to the Intensive Care Unit, patients over 14 years of age, patients with co-morbid or non-comorbid conditions and who belong to any occupation, caste or gender. Exclusion requirements cover pregnant or lactating mothers and under 14-year-old patients. The resources used for the research were medical histories of patients and the type of a drug mistake (method of data collection). The drug error form was developed with the assistance of a health care professional. Forms were printed and kept in the ICU for the reference of Health-care professionals. Clinical histories of patients were checked, and regular patient interviews were performed. Once the incidence was confirmed the medication error was filed and documented. The Institutional Review Board ethical approval for the for study was obtained. (JSSCP/**IEC/ 01/2018-19)**

RESULTS

A total of 116 drug errors were discovered from 103 patients according to the findings of this report. Considering the type of error, prescription errors were found to be more frequent than other errors such as administration error, paperwork error and transcription error shown in Figure 1. Illegal handwriting was the main cause of medication error, the use of lookalike drugs and incomplete dose, dosage and frequency information are features in Figure 2. The

number of drug errors in men was higher than in women, as seen in Figure 3. The cardiovascular system was found to be the system most affected and is shown in Table 1. For this analysis, the age group of 55-64 years and 45-54 years was most affected, as is shown in Table 2.

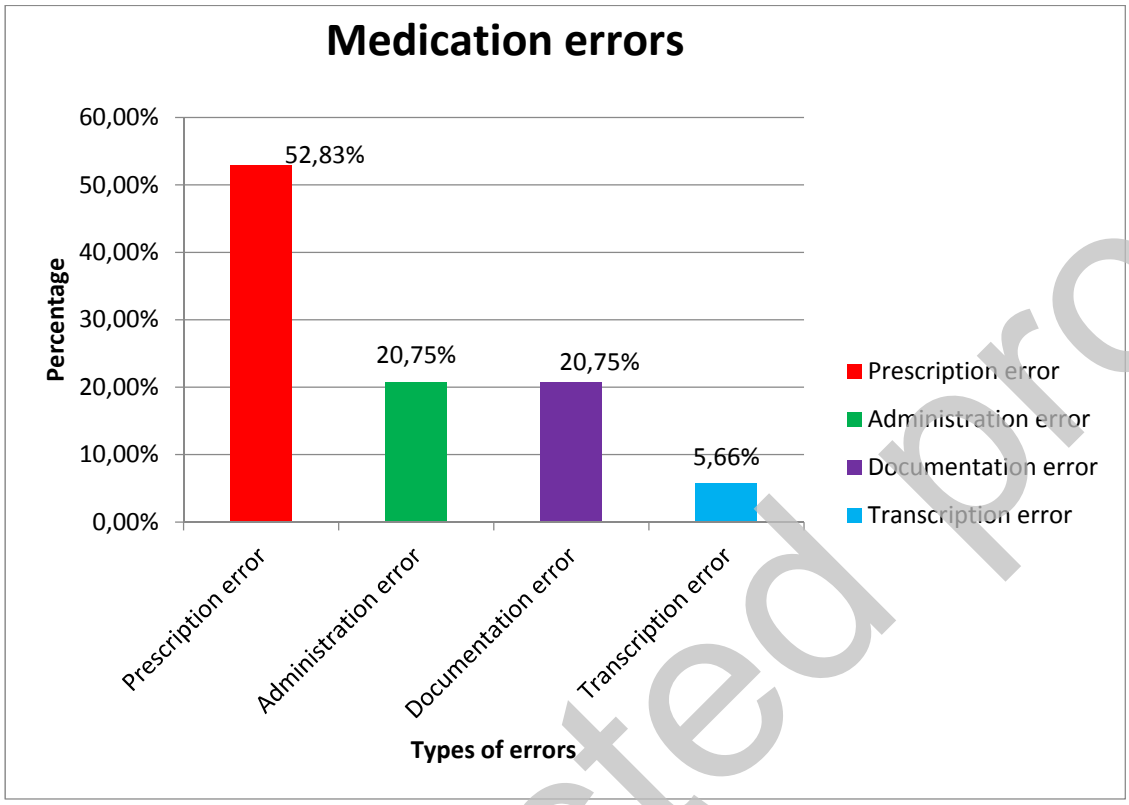

Figure1: Different type of medication error

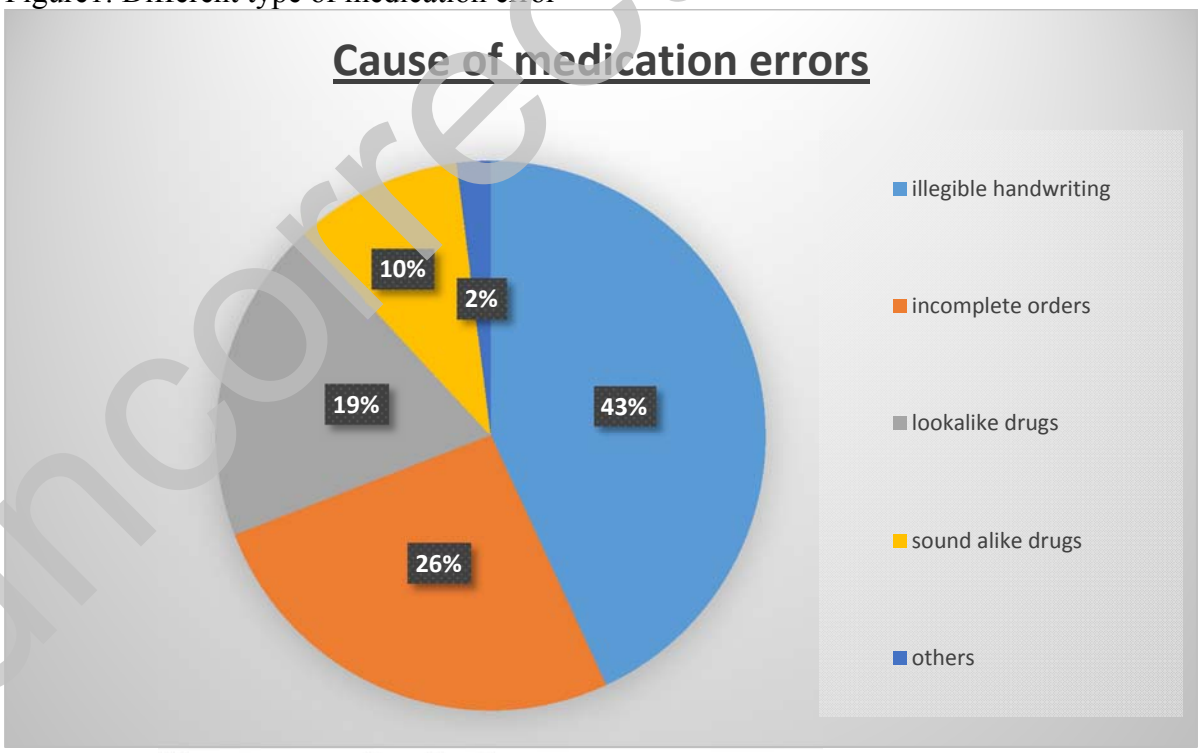

Figure 2: Different causes of medication errors

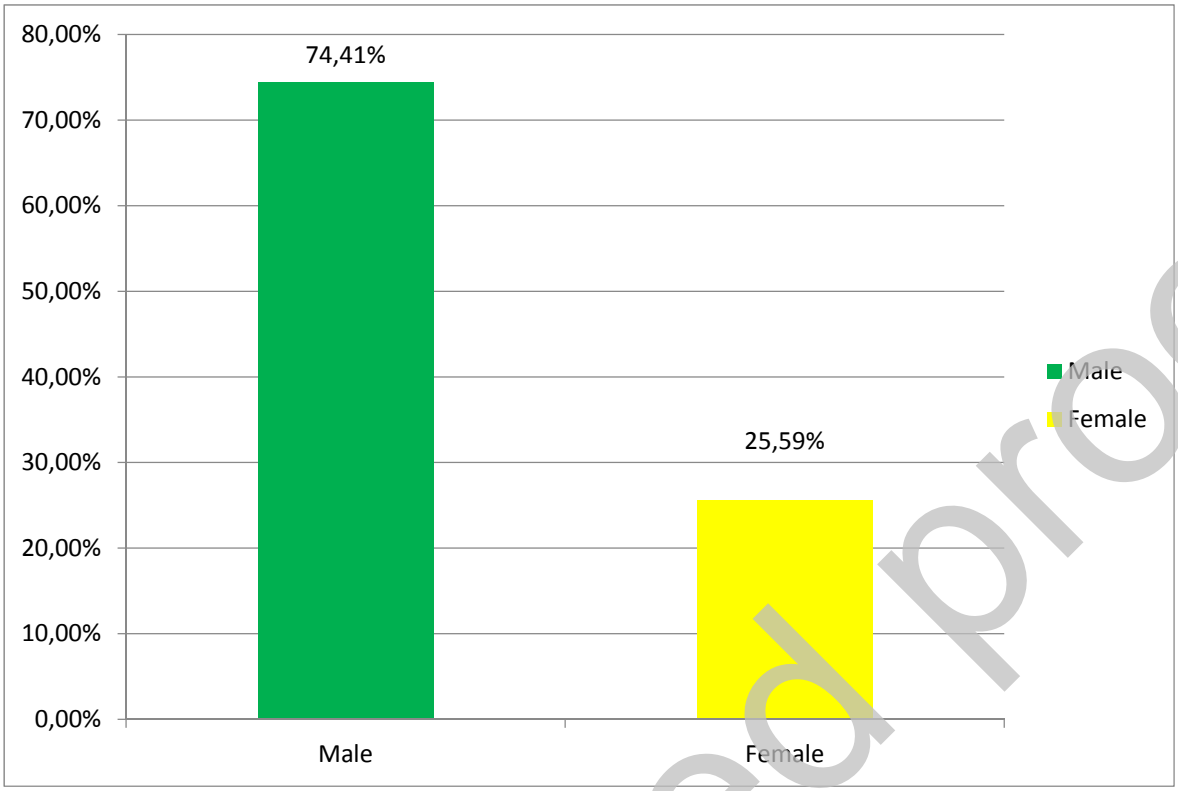

Figure 3: Male population is majorly affected

Affected Systems	Types of Systems	No of cases
	Digestive system	17
	Cardiovascular system	43
	Muscular system	13
	Nervous system	6
	Respiratory system	19
	Excretory system	5

Table 1: Cardiovascular system highly affected

Age Group	Years	Percentage
	15-24	2.0
	25-34	6.97
	35-44	12.0
	45-54	23.25
	55-64	27.88
	65-74	18.60
	75-84	4.65
	85-94	4.65

Table 2: Different age groups

DISCUSSION

Medication errors are a major concern in many health care settings. This can have serious implications for patients and healthcare providers alike. It contributes to extended stay in hospital with detrimental impacts. The main objective of this research is to determine the prevalence of medication errors in an Intensive Care Unit with patient safety goal by defining

and reducing the major cause of medication errors. To recognize various forms of medication errors and to raise awareness among health care professionals about medication errors.
The goal of the drug treatment is to optimize the clinical outcome and enhance the overall quality of life of the patient. Drug mistakes, however, have major consequences for the safety. These errors may occur at various stages of drug usage, such as prescribing, dispensing, and giving. The early identification of these errors is of great importance for the health of patients. The most common source of medication error in the current study was found to be a prescription error of 52.83%, followed by administration and reporting of 20.75%, followed by a transcription error of 5.66%. Published research papers show that not every mistake in the drug causes damage. Hospitals need to build and create mechanisms to avoid medication errors by identifying and recognizing the cause of the errors. The program will concentrate on creating incentives for improving the efficiency and improvements to the program. The pharmacists must be active in collaboration with doctors, nurses, and other personnel to ensure that the prescriptions for medication are safe and correct. The patient's medication files were checked in the current study, and reports of errors were produced. The study emphasizes the importance of recording errors in developing prevention approaches aimed at minimizing medication errors.

CONCLUSION

Defining the medication error characteristics and patterns can direct preventive errors. Patients with life-threatening diseases were established Intensive Care Units (ICUs). The ICU atmosphere produces potentially high-risk iatrogenic events. Critically ill patients, due to the underlying comorbidities and acute organ dysfunctions, are particularly vulnerable to drug errors. Identifying medication errors is thus critical for reporting and preventing this risk. Perhaps more than one would expect the underlying cause of the medication error which needs fundamental changes in the healthcare systems. Additionally, the current prescription methods need to be updated and the lookalike drugs specifically distinguished to prevent medication errors. One of the required improvements is to include pharmacist in the healthcare team and use their experience and mitigate the error of medication. Knowledge campaigns for healthcare professionals should be implemented and, likewise, awareness of the serious side effects of the drugs and how to manage them should be provided to the common lay people. There is an urgent need for a systemic approach to reducing organizational vulnerability to errors by providing the tools needed to track, assess and execute successful interventions.

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CONFLICTS OF INTEREST

The authors declare none.

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