



A study on identification of medication error in a Tertiary Care Hospital, Chennai

K Bharathi Priya*, Ann Mariya Jose, Rheya Mathew, Sanaj Varghese, Yemimah Elizabeth Shaji
Department of Pharmacy Practice, CL Baid Metha College of Pharmacy, Chennai, Tamil Nadu, India

Abstract

Background: Medication errors have become an increasing threat in compromising patient's quality of life. This study sought to identify the occurrence of medication error in a tertiary care hospital. The objective behind the study is to find out the prevalence of medication error, their source and reasons behind its occurrence in a tertiary hospital care setting in Chennai.

Method: A prospective observational study was done for six months duration with the help of patient treatment chart, prescriptions and nursing administration records. Data was collected using a medication error identification form. A total of 174 records were collected from cardiology, general medicine, gynaecology, gastroenterology, neurology, nephrology, orthopaedics, oncology and pulmonology departments. Among the 174 patient records, 120 medication error came into notice.

Results: Among 120 medication errors, 32.5% (39) error happened during documentation of the patient medical records. Administration error were of 30% (36) followed by prescription error 25.83% (31), transcription error 7.5% (9) and dispensing error 4.16% (5). The source of medication error were studied during the survey and found that 70% of medication error were happened by nurses as they contributed for a large population of healthcare workers. 26% (31) medication error by physicians during prescribing medical orders and 4% (5) medication errors by pharmacist during drug dispensing occurred. Reasons behind the prevalence of medication error was also observed during the study and found that negligence/carelessness (41.6%) by the healthcare professionals was the ultimate reason for the occurrence of medication error followed by illegible prescriptions (32.5%), improper documentations (17.5%) and other miscellaneous factors (8.3%) during a hospital stay.

Keywords: medication errors, documentation error, administration error, transcribing error, dispensing error, prescription error

Introduction

The World Health Organization defined Medication Error (ME) as any preventable error that can cause or lead to improper medication use. It can cause potential harm to the patient while the patient is under the treatment and care of health care providers. A Harvard study by professor Jha shows that 5.2 million medication errors are reported in India annually. In hospitals, the use of medication is a complex process and its success depends on health care professionals working in different departments. Medication errors have become a common scenario that is increasing day by day in a hospital setting. In India, standard medication error reporting is unavailable. Due to the fast-growing rates of medication errors all over the world, routine prescription auditing has come into practice in all the multispecialty and tertiary healthcare hospitals in India. Factors that may contribute to the increased risk of medication errors are those with serious health conditions, older patients, paediatrics, using high-risk medicines, polypharmacy. Poor communication is the most common factor reported that contributed to medication errors [1, 2]. In hospitals, a medication error can happen at any stage from drug dispensing to administering the drug to the patient and monitoring its effects on them and can also be prevented with proper care. Errors happening at different stages of the drug delivery process may be due to lack of knowledge or experience, memory slips or lapses. Pharmacists have a major role in improving the patient's healthcare system along with

physicians, nurses and other healthcare workers to ensure patient safety. In the Indian scenario, medication errors and medication-related problems are mainly due to the irrational use of medications and about 7000 mortalities have been reported annually due to medication errors [3]. Studies have revealed that about 1.5 million people are harmed and \$3.5 billion are utilized for hospital expenses due to medication error [4].

Medication errors have been reported as the seventh most cause of death, overall. Neglect to the strategies for reducing medication error can lead to increased hospital stay and expenses, unnecessary diagnosis and treatments [5].

Classification

Medication errors are mainly classified into:

- Prescription error
- Administration error
- Transcription error
- Dispensing error
- Documentation error

Prescription Error

Prescription errors are caused while prescribing a drug to the patient by prescribers. This maybe in the form of wrong dose, wrong frequency, wrong dosage form, wrong quantity, wrong route of administration, illegible prescription or wrong instruction about a drug [6].

Dispensing Error

Unintended deviation from the prescription occur due to lack of time and knowledge, carelessness, misinterpretation that can lead to incorrect medication, dosage strength or dosage form [7, 8].

Administration Error

Administration errors are caused while administering a drug to the patient. These errors are a result of carelessness, negligence, confusion or lack of awareness and knowledge. This can be discussed under different subcategories: [9]

- Omission Error
- Wrong Frequency
- Wrong Dose and Dosage Form
- Wrong Administration Error
- Deteriorated Drug Use Error

Transcription Error

Transcription error is a particular type of data entry error. Transcription errors occur while data entering or documenting information related to patients that are commonly caused due to slips and laps of the medical professionals [10].

These medication errors can be prevented by educating and training healthcare professionals and fellow pharmacists, active ward round participation, and good communication with other healthcare professionals [11].

Documentation Error

Documentation errors are caused by physicians or nurses due to lack of time and proper knowledge, illegible handwriting and carelessness [12].

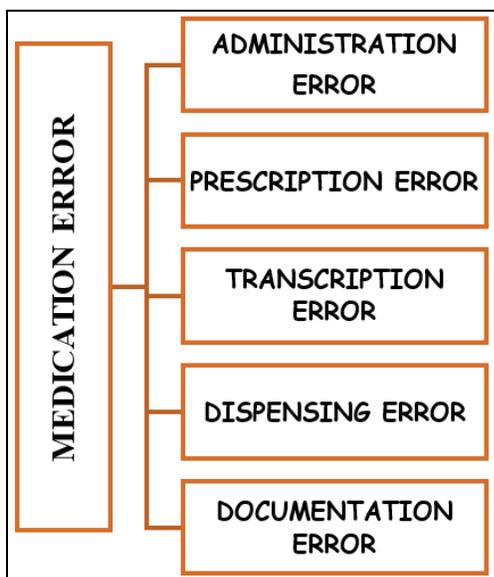


Fig 1: Types of Medication Error

Being pharmacists the increasing convolution of medication errors among patients in their day-to-day life should be noticed and it's our duty to increase the quality of life by minimizing them [13].

Medication Error Reporting

Minimization of medication errors can be bought into action

by identifying and reporting them. Medication error reporting can help in creating awareness and warning among healthcare professionals. In clinical areas, medication error reporting can be monitored or reported by physicians, nurses, clinical pharmacists, and healthcare professionals. Medication error reporting should be given much importance as it plays a major role in patient's health management and economic consequences [14].

Medication errors are reported in a systematic way using a medication error reporting form which can be filled by the healthcare professionals when they observe any type of error. This is documented for improving patient's quality of life and to provide awareness among healthcare professionals [15].

Methodology

A prospective observational study was carried out in a tertiary care hospital in Chennai. The study was conducted for a period of six months. Patient case records from both the Inpatient and Outpatients department of cardiology, general medicine, gynecology, gastroenterology, neurology, nephrology, orthopedics, oncology, and pulmonology were collected.

A total of 174 patient case records were collected using patient treatment charts, prescriptions, and nursing administration records, and 120 Medication Errors were observed using the Medication Error identification form.

Results

174 Patient case reports were collected from nine different departments – cardiology, general medicine, gynaecology, gastroenterology, neurology, nephrology, orthopaedics, oncology and pulmonology out of which 120 Medication Error were observed.

The present study calculated the error percentage from each department and found that 19.54% (34) of errors were observed from the orthopaedics department, 16.09% (28) from oncology, 14.94% (26) from neurology, 14.3% (25) gynaecology, 8.04% (14) from nephrology, 7.47% (13) cardiology, 6.89% (12) gastroenterology, 6.32% (11) from general medicine and pulmonology departments.

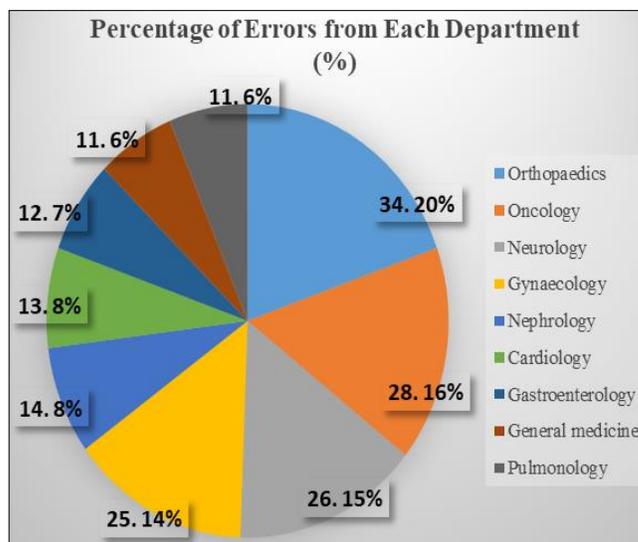


Fig 2: Percentage of Error Identified from Each Department

After retrieving the Medication Error from each department, the observed errors were classified based on their types. Documentation Errors were found out to be highest with 32.5% (39) errors followed by 30% (36) of Administration errors, 25.83% (31) prescription errors, 7.5% (9) transcription errors and 4.16% (5) dispensing errors.

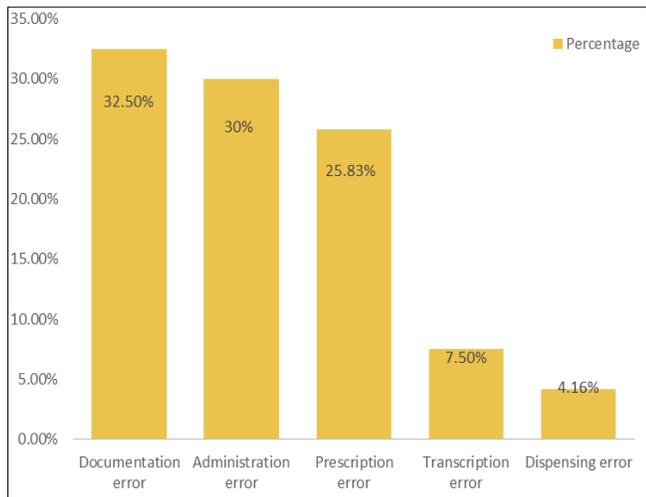


Fig 3: Types of Medication Error

Study objectives focused on the source of error and found that physicians, nurses, and pharmacists were the main source of error. Investigations showed that 70% of medication errors

Were happened by nurses as they contributed to a very large population of healthcare workers accompanied by 26% of errors by physicians and 4% of errors by pharmacists.

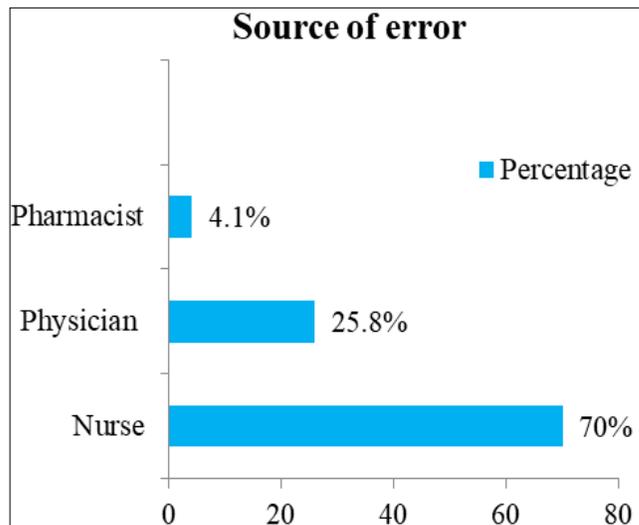


Fig 4: Sources of error

Reasons for the cause of medication errors were examined and found that negligence carelessness, illegible prescription, improper documentation and other miscellaneous factors contributed to the occurrence of medication errors.

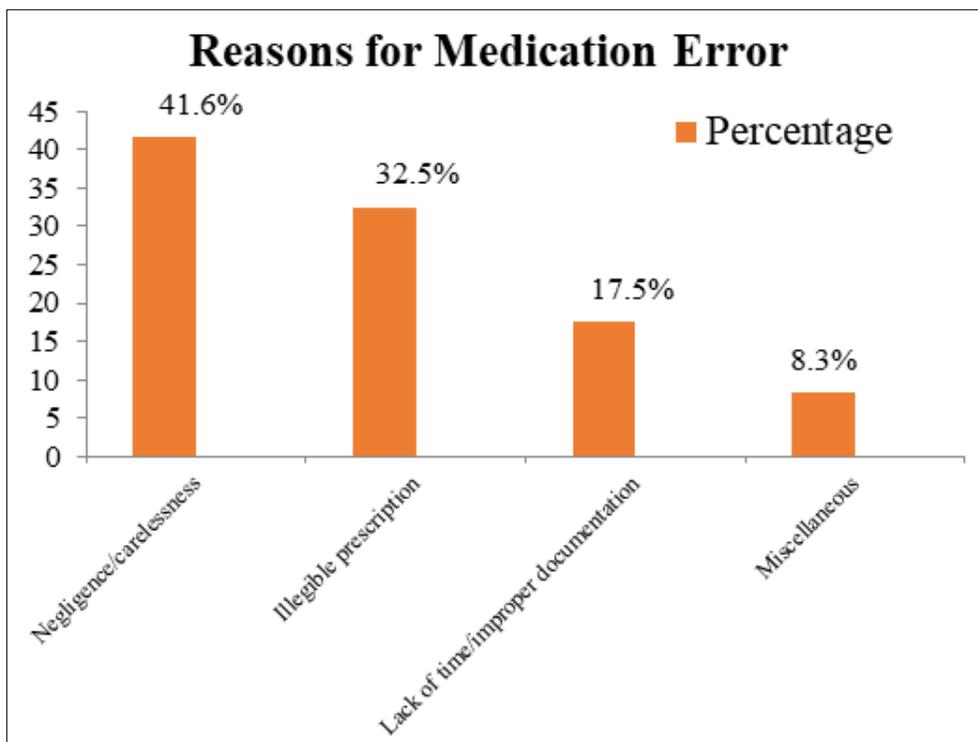


Fig 5: Reasons for Medication Error

Due to negligence/carelessness, illegible prescription, lack of knowledge/time, and other factors, the patient’s quality of life was compromised by healthcare professionals. About 50 (41.6%) medication errors were due to negligence/

carelessness, 39 (32.5%) of illegible prescription, 21 (17.5%) by lack of knowledge/time and rest 10 (8.33%) were other factors.

Discussion

This study was conducted in a tertiary care hospital in Chennai to study the identification of Medication Error and their source. This prospective observational study was carried out for 6 months duration. In patients and outpatients from cardiology, general medicine, gynecology, gastroenterology, neurology, nephrology, orthopaedics, oncology and pulmonology departments were included in this study. A total of 174 patient records were analyzed from each department and 120 medication errors were observed by collecting the Medication Error identification form. During the study documentation error (32.5%) were found to be the highest. The main causes behind this type of error were memory lap or slip by the nurse or other health care professional. Most commonly this happens when a nurse forgets to document the drug which they have already given or document the drugs which are not given. This is as a result of lack of time, forgetfulness and improper handing over of shift from one nurse to another. Documentation errors can be reduced by conducting continuing medical education for the nurses and make them realize the importance of reducing Medication error by documenting the given drug. 30% of medication errors were observed in the study as administration error. These kinds of error are mainly caused by nurses, maybe due to insufficient knowledge and negligence. This Study also shows 26% of prescription error occurred due to illegible prescription by the physician. Illegible prescription can lead to improper drug delivery which includes wrong dose, wrong dosage forms, wrong frequency, and also sometimes different drug. Transcription error accounted for about 7.5% of the study, commonly caused due to slips and lapses of the medical professionals. Dispensing errors accounted for 4% in the study, caused by the pharmacist, can be due to negligence/carelessness. Difficulty in reading prescriptions, lack of knowledge/experience in distinguishing between LASA drugs, dispensing the wrong dosage form when not prescribed are some of the reasons behind this type of error. This study shows that medication errors can happen at any stage of the drug delivery process. Each health care professional plays a very important role in improving patient's quality of life during hospital stays by reducing medication errors. Patient treatment charts, prescriptions, and nursing administration record from each department provided information about the reason behind the occurrence of medication error. Nurses (70%), physicians (26%), pharmacists (4%), or other healthcare professionals were found to be the main sources of Medication error. Healthcare professionals consist of a very large population of nurses, therefore the chance for the occurrence of Medication error is very high if negligent. This study revealed that negligence/carelessness (41.6%) illegible prescription (32.5%), and improper documentation (17.5%), and other miscellaneous factors (8.3%) were the reasons for the incidence of Medication error.

Conclusion

The prospective observational study conducted in a tertiary care hospital in Chennai for six months revealed that 69% of Medication errors were found in a sample size of 174 patient records. Errors were classified based on their types

(descending order) documentation error (highest) administration error, prescription error, transcription, and dispensing error. Reasons behind error occurrence and the source of error was investigated and found that 70% of Medication error were caused by nurses. This may be due to a high workload, negligence, or maybe due to lack of knowledge/experience. Medication error is a preventable error that can be reduced by providing proper education and training to a healthcare professional.

Limitations

In this present study, due to the short span of time cases could only be collected from cardiology, general medicine, gynecology, gastroenterology, neurology, nephrology, orthopedics, oncology, and pulmonology departments.

Summary

A total of 174 patient records were collected using patient treatment charts, prescriptions, and nursing administration records. In patients and outpatients from cardiology, general medicine, gynecology, gastroenterology, neurology, nephrology, orthopedics, oncology, and pulmonology departments were included in this study. The type of medication error was observed and their source of error, the reason behind their incidence was analyzed. From 174 patient records, a total of 120 (69%) medication errors were identified. Among these, documentation error (32.5%) was found to be the highest and the primary reasons were found to be negligence/memory lapse, lack of knowledge/experience, and improper documentation. Documentation errors mainly happened when nurses documented the administration chart before administering the drug or not documenting the drug after administration. Administration errors (30%) were found almost equal to documentation error, omission of the drug was the main cause of this error. From this study, we concluded that proper education about the importance of medication document and administration is essential to reduce ME. Reduction in Medication error has significant implications on patient's safety.

References

1. Agarwal P, Sachan A, Singla RK, Jain P *et al.* Statistical analysis of medication errors in Delhi, India. *Indo glob. j. pharm.*2012;2(1):89.
2. Karthikeyan M, Lalitha D. A prospective observational study of medication error in general medicine department in a tertiary care hospital. *Drug Metabol Drug Interact*, 2013.
3. Patel N, Desai M, Shah S, Patel P, Gandhi A. A study of medication errors in a tertiary care hospital. *PICR*, 2016.
4. Da Silva BA, Krishnamurthy M. The alarming reality of medication error: a patient case and review of Pennsylvania and National data. *Journal of Community Hospital Internal Medicine Perspectives [Internet]*,2016;6(4):31758.
5. Ramesh G, Sundeep K, Anitha C, Malika S, Samyuktha KR, Sharmila S *et al.* Incidence of Medication Errors in a Tertiary Care Hospital in South-India. *IJOPP [Internet]*,2019;12(2):92-6.
6. Sheikh D, Mateti UV, Kabekkodu S, Sanal T. Assessment

- of medication errors and adherence to WHO prescription writing guidelines in a tertiary care hospital. FJPS, 2017.
7. Amin Pourhoseingholi M, Vahedi M *et al.* Sample size calculation in medical studies; GHBB,2013;6(1):14-17.
 8. Morelock SG, Kirk JD. An urban medical system's exploratory study of medication errors. Nurs Open,2019;6(3):1197-204.
 9. Ferner ER *et al.* Medication errors, Br J Clin Pharmacol,2012;73(6):912-916.
 10. Zhou S, Kang H, Yao B, Gong Y. Analyzing Medication Error Reports in Clinical Settings: An Automated Pipeline Approach. AMIA Annu Symp Proc, 2018, 1611-20.
 11. Mark BA, Belyea M. Nurse staffing and medication errors: cross-sectional or longitudinal relationships. Res Nurs Health,2009;32(1):18-30.
 12. Likic R, Maxwell SR. Prevention of medication errors: teaching and training. Br J Clin Pharmacol,2009;67(6):656-61.
 13. Machado Alba JE, Moreno Gutiérrez PA, Moncada Escobar JC. Hospital medication errors in a pharmacovigilance system in Colombia. Farm Hosp,2015;39(6):338-43.
 14. Teigen IM, Rendum KL, Slordal L, Spigset O. Medication errors in hospitalized patients, Journal of practical medicine, new series,2009;129(13):1337-41.
 15. Rosa MB, Perini E, Anacleto TA, Neiva HM, Bogutchi T. Errors in hospital prescriptions of high-alert medications. Revista de saudepublica,2009;43:490-8.