



Review of medication errors in a tertiary health care center in the capital city of India

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Abstract

The problem of Medication Errors in a tertiary care center is multi factorial and may involve more than an individual. All healthcare professionals have a responsibility in identifying the contributing factors of medication errors and use that information to further reduce their occurrence. Human errors must be considered as an intrinsic component of socio- technical system. Usage of drugs is a complex process and there are many drug related complications at various levels, which involve doctors, pharmacists, nurses and patients. Some medication errors are preventable and pharmacists have an active role in the appropriate use of drugs. In our systematic review, we have found that the poor knowledge of drugs, dosages and administration route amongst physicians and staff nurses were one of the most dominant contributing factors towards medication errors. Developing countries like ours, calls for the need to introduce educational programs to improve drug prescribing skills and knowledge of physicians, as well as to encourage nurses to improve their standard of drug administration.

Keywords: Medication Errors, drugs, educational programs.

Introduction

Medication Errors are inappropriate use of drugs that may or may not cause any undesirable and unwanted clinical events in a patient. Medication Errors may also cause adverse drug reaction events which the *National coordinating council of medication error reporting and prevention (NCC MERP)* defines as “any preventable event that may cause or lead to inappropriate medication use or patient harm while the medication is in the control of healthcare professional or consumers”. It occurs in every health care setup and can adversely affect a patient’s quality of life, morbidity or even mortality.

Medication Errors are one of the leading causes of death in the West surpassing deaths caused by AIDS, breast cancer or road traffic accident. Similar studies in Australia, New Zealand, Canada and Saudi Arabia have demonstrated that the rates of adverse drug reaction caused due to Medication Errors are significant and do not differ much from the ones reported in the West. Similar studies in southeastern countries (India) are limited due to lack of reporting on Medication Errors. The cost of managing these Medication Errors can be high whether they occur in any primary health care centers or tertiary health care centers.

Adverse events and Medication Errors are an inevitable reality of any health care system in pediatrics as well as in adult medicine. Medication errors have a huge impact on health care system, patients and payers alike, thereby compromising the expectations of patients on health care system.

Methods

This data is from a 600-bedded super specialty hospital in India. Physicians, clinical pharmacists and nursing staffs collected this data from each wards of the hospital for a period of 12 months. Retrospective analysis and inferential statistics were used to identify the mistakes and also to rectify them. We identified the medication error(s) on the basis of prescription error(s), dispensing error(s), administration error (s), documentation error(s), transcription error (s), physician(s), pharmacist(s), nurse(s), duty shift of nurse(s) and clinical pharmacist. We also differentiated Medication Errors from the near miss errors, and if it was a medication error we classified it into the severity of the same.

Results

Medication errors are a common cause for iatrogenic adverse events. They can lead to severe morbidity, prolonged hospital stay, unwanted diagnostic tests, unnecessary treatments and death. A medication error is an event associated with the use of medication that should be preventable through selective control systems.

The aim of this study is to find the various types of Medication Errors during different duty shifts of nurses, pharmacists and physicians in a tertiary care hospital in India. There were no significant gender or age differences. There was significant difference in the type of Medication error(s) in various duty shifts.

There were 480 Medication Errors (ME) recorded in a span of 12 months, out of which 334 (69.5%) were ME, and the remaining 146 (30.5%) were just near miss errors (Fig: 2). Considering the duty shifts of the nursing staffs, 208(43.3%) ME were reported in the morning shift (8.00am-4.00p.m), 220 (45.8%) ME were reported in the afternoon shift (2.00pm-9.00p.m) and remaining 52(10.9%) ME was reported in the night shift (9.00pm-8.00am) (Fig: 1). Our study also revealed that Administration errors 160 (33.33%) and prescription errors 101 (21.04%) were the highest in number among the types of Medication error that have occurred and reported (Fig: 3). Transcription errors 60 (12.59%), Indenting errors 85(18%), Dispensing errors 70(15%) and Documentation errors 4 (0.04%) were among the other errors reported (Fig: 3). Clinical pharmacist reported the maximum number of errors 264(55%) and the physicians reported the least i.e. 5(1%) (Fig: 4). Nurses 205(43%) and the pharmacy staff 6 (1%) were among the others to report (Fig: 4). It was noted that the physicians and the nursing staffs working in the night shifts reported minimum error and Documentation errors were the least reported error (Fig: 1,3). The possible causes of this outcome could be due to lack of knowledge of what should be reported, difficulties in filling Medication error forms, fear of being blamed, fear of being punished or the forms filled were incomplete/inadequate.

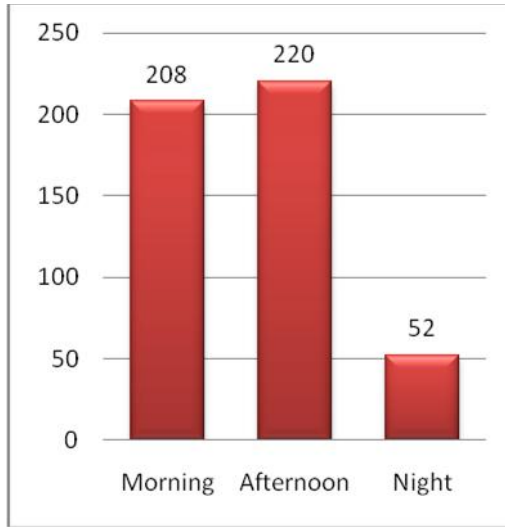


Fig: 1 – Numbers of Medication Error in different duty shift of the nurses.

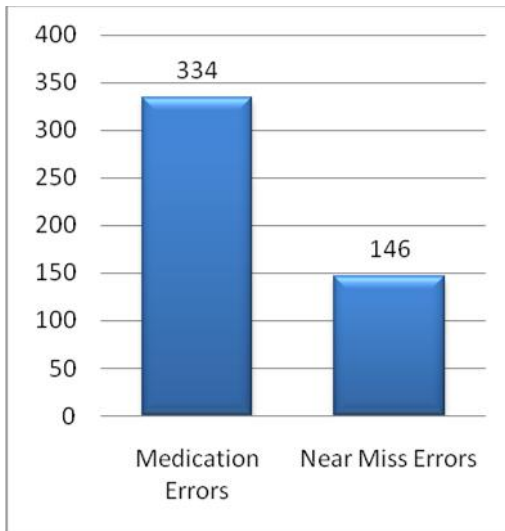


Fig: 2 – Category of the Medication errors

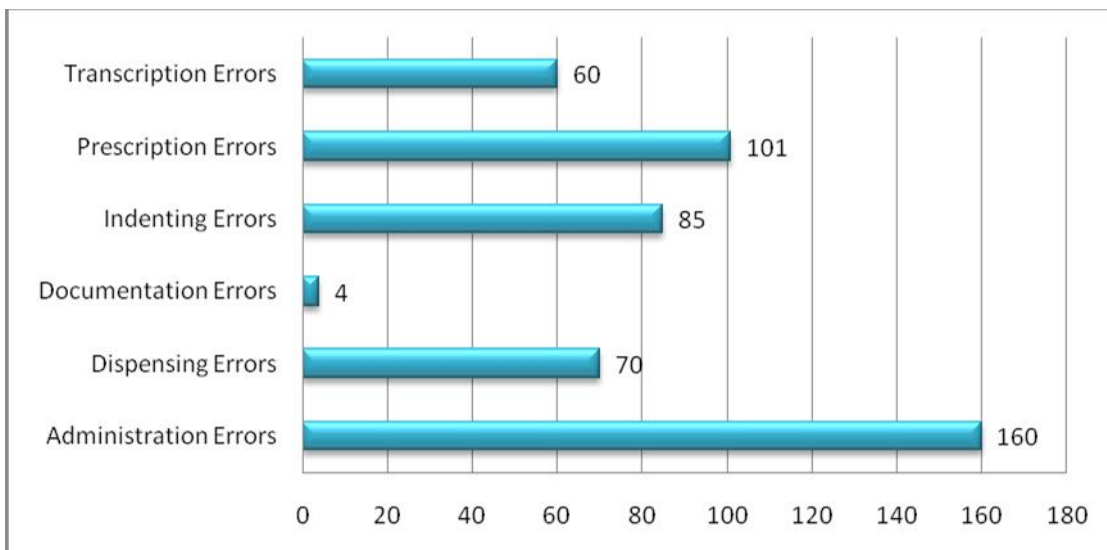


Fig: 3 - Classification of the medication errors

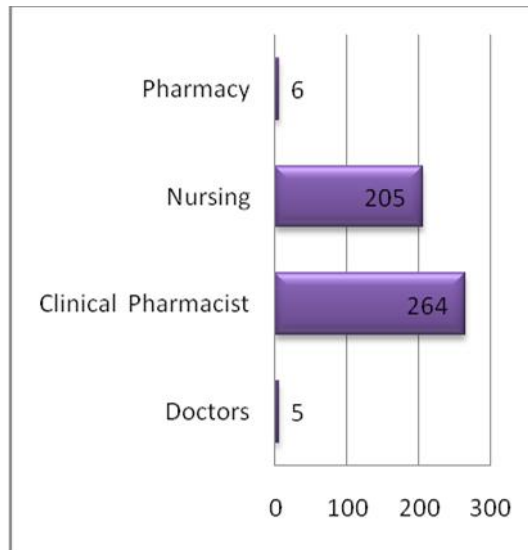


Fig: 4–Reporting Individual

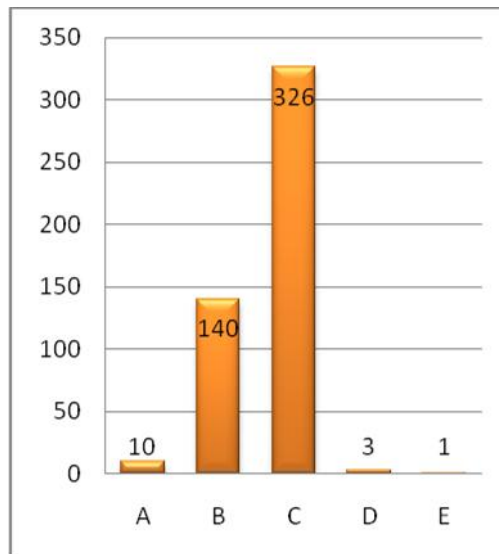


Fig: 5 – Severity of the medication errors

Based on the severity of Medication Errors and near miss errors (table 1), it was noted that category C 326 (68%) (An error which had

reached the patient but did not cause any harm), produced a significant outcome, however errors from category F, G, H and I were not reported.

(Table -1)

Types of errors	Category	Result
No error	Category A	Circumstances or events that have the capacity to cause error
Error, No harm	Category B	An error occurred but the medicine did not reach the patient
	Category C	An error occurred that reached the patient but did not cause patient harm
	Category D	An error occurred that resulted in the need for increased patient monitoring but no patient harm
Error harm	Category E	An error occurred that resulted in the need for 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 permanent patient harm
	Category H	An error occurred that resulted in near death event (eg. Anaphylaxis, cardiac arrest)
Error Death	Category I	An error occurred that resulted in death

Discussion:

Medication errors can be classified broadly into prescription errors, dispensing errors or administration errors. Contributing factors in the prescription error include incorrect drug selection, drug strength, route and quantity. Physicians have an ethical and professional responsibility to prescribe safe and legible medicines. At times due to over work, fatigue or simply due to lack of understanding the importance of clear handwriting leads to the contribution of errors (1-3). Studies by Lesar et al, reported an error rate of 4 per 1000 prescriptions causing significant drug reaction. Dispensing errors are the one, which usually occurs during or after receipt of prescription by the pharmacist till the delivery of the medicines. It includes delivery of a wrong drug or wrong strength or wrong patient. Most common cause of dispensing error is if two or more similar drugs bearing similar names or appearance. Administration errors are associated with highest risk in nursing practice in most healthcare system. Giving the 'right' dose of 'right' drug to the 'right' patient at the 'right' time by 'right' route in the five 'right' policies – which have been the basis of nursing education on drug administration. Administration error can also be due to drug omission, due to lack of stock. Other factors that may contribute to Medication Errors are inaccurate drug history taking, inappropriate use of decimal point, use of abbreviations and use of verbal orders. (2-5)

Our findings highlighted that poor knowledge of medicines was a contributory factor in both prescribers and nurses administering drugs. Various studies have cited that educational programs for drug prescribers and nurses concerning drug therapy are urgently needed to avoid drug errors and to improve patient's safety. Studies have also found that clinical pharmacists play a significant role in delivering training and competency assessment. (5,6-9,12,13)

Hartnell (2012) in Canada, Tmrayyan (2012) in Jordon and Thomas (2010) in France, Hashemi (2012), Chiang (2006) did separate researches on factors that are associated with reporting nursing errors (13,14).Hashemi (2012) demonstrated that

the most common barriers preventing reporting the Medication Errors includes fear of legal action and job threats, fear of economic losses, fear of honor and dignity, weakness of knowledge and weakness of nursing skills in error management/reporting. (7-9). McFadden (2006) and Frith (2012)in their research(13,14) identified some critical strategies for improving reporting of the Medication Errors system based in hospitals which includes reporting errors free of blame, open discussion of errors, cultural shift, education and training, statistical analysis of data, system redesign, clear guidelines and procedures for reporting errors.

According to the various literatures reviewed on Medication Errors, the following recommendations are suggested to reduce ME and increase the awareness of MEs of health care professionals (1,10,11).

1. Physicians need to pay more attention towards prescription.
2. Improve medication error reporting systems and policy among Organization and clarify the importance of reporting.
3. Educational programs by clinical pharmacists and clinical pharmacologists on drug therapy are urgently needed for doctors and nurses.

Conclusion

The importance of Medication Errors reporting were not being stressed enough. Awareness of Medication error(s) reporting among nurse, clinical pharmacists and physicians would increase the reporting rates of adverse drug reaction. Our study clearly demonstrates that to improve the clinical quality of a healthcare setup, physicians, clinical pharmacists and nurses have to play a greater role in pharmacovigilance. Therefore researches, which involve identifying and describing Medication Errors and thereby avoiding the adverse reaction, will provide a foundation towards a better a health care system.

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