A Study on Medication Error Reporting Process in a Tertiary Care Teaching Hospital

Dr. Arun M S[1], Dr.Kritika Das[2], Suresh K[3]

[1](Department of Hospital Administration , Ramaiah Medical College/, India)
[2](Department of Public Health, Manipal College/ Manipal University, India)
[3](Ramaiah Memorial Hospital/Bangalore, India)
Corresponding Autor; Dr. Arun M S

Abstract: *A Medication Error is any preventable event that may cause or lead to inappropriate medication use or lead to inappropriate medication use or patient harm while the medication is in the control of the healthcare professional, patient or consumer. Such events may be related to professional practice, healthcare products, procedures & systems including prescribing,order communication, product labeling, packaging, nomenclature, compounding, dispensing,distribution, administration, education, monitoring & use.Patient safety is a major public health concern & Medication errors are among the most common medical errors leading to morbidity and mortality and increased healthcare costs to the patients .As the study setting is a 2032 bedded hospital with an average daily admissions of approximately 250 patients i.e. around 1700 patients are treated in the hospital. The aim of the study is to study the medication error reporting process of a tertiary care teaching hospital with a view to improve it, with objectives to study the medication error reporting process of a tertiary carehospital and to find out improvement opportunities for capturing and reportingof medication errors.*

I. Introduction

Medicines are the most widely used treatment in healthcare & they contribute to significant improvements in health when used appropriately. However use of medicines is also associated with harms &errors. A landmark report released by the Institute of Medicine (IOM) in November1999 entitled―To Err Is Human: Building a Safer Health System ‖estimated that at least 44000 people in United States die every year a result of medical errors out of which7000 die from medication errors which is an alarming number [1].

According to the National Coordinating Council for Medication Error Reporting & Prevention (1998), an organization which was composed of 19 national organizations & individual members had developed a detailed definition of what constitutes a Medication Error(2).The provision of drug therapy by a medical provider to a patient is a complex process. Errors can occur at any step along the way, from prescribing to the ultimate provision of the drug to the patient. Common causes of medication error include incorrect diagnosis, prescribing errors, dose miscalculations, poor drug distribution practices, drug and drug device related problems, incorrect drug administration, failed communication and lack of patient education.

Preventable errors occur because systems for safely prescribing and ordering medication are not appropriately used (3).

* A widely recognized cause of error is illegible hand written prescriptions.
* Errors may result from insufficient or missing information about co-prescribed medications, past dose-response relationships, laboratory values and allergic sensitivities.
* Errors in prescribing can occur when an incorrect drug or dose is selected, or when a regimen is too complex.
* When prescriptions are transmitted orally, sound-alike names may cause error.
* Similarly, drugs with similar-looking names can be incorrectly dispensed when prescriptions are handwritten.
* Physician sampling of medications can contribute to medication errors due to the lack of both adequate documentation and drug utilization review.

II. Material And Methods

AIM: To study the medication error reporting process of a tertiary care teaching hospital with a view to improve it.

Objectives:
1) To study the medication error reporting process of a tertiary care hospital.
2) To find out improvement opportunities for capturing and reporting of medication errors.

Review Of Literature:-
According to a 2000 report citing UK. Medical defense organization, 25% of all litigation claims in general medical practice were due to medication errors and involved the following errors: prescribing and dispensing errors, repeat prescribing without proper checks, failure to monitor progress [4]. A study titled,– A systematic approach of tracking and reporting medication errors at a tertiary care university hospital, Karachi, Pakistan published in the year2008 the main error rate was 5.5% and pharmacists contributed an higher error rate of 2.6% followed by nurses (1.1%) and physicians (1%). Another study titled–Improving the quality of written prescription in a general hospital: The influence of 10years of serial audits and targeted interventions showed that Serial audits of the quality of prescribing on hospital medication charts can rapidly identify the extent of deficiencies in prescribing practice, facilitate interventions specifically designed to address these and monitor their influence.[5]

A prospective observational study titled,–Medication errors in medicine wards in a tertiary care teaching hospital of a hill state in India published in year 2012 featured Optimization of the medication process can be achieved by medication standardization, computerized physician order entry, clinical decision support, bar code technology, computerized intravenous infusion devices[6]

This section describes the design and methods used in this research to achieve the aim and objectives stated.

Study period- January 2016- April 2016
Study setting: Inpatient dept. of a tertiary care teaching hospital
Study population: Inpatients of the hospital admitted from January 2016-April 2016
Source of Data: Data was collected from the doctor's orders & nurses notes of inpatient records and by interviewing the respective in-patients, and the nursing staff.
Sample size- 812 Inpatients
Sampling technique: Random sampling from the Inpatient Dept.

Study Design:
1) Observational study &interviewing the concerned personnel to understand the existing process and studying the data available of medication errors reported through Audits and Incidence Reports.
2) Prospective observational study using a study tool for a period of January 2016- April2016.
Observation: -
For the first objective that is, to understand the medication error reporting process of the hospital – all the concerned personnel were interviewed i.e. The doctors, postgraduates, staff nurses, pharmacists, assistant nursing superintendent, Nursing superintendent, Hospital Quality management representative, Safety committee chairman. The reporting of medication errors are done in 2 ways.
1) Medication Error Audits- for ruling out medication errors in the inpatient records.
2) Medication Error Incident reporting

Process Flow of File Audits:
The number of patient records to be audited is decided based on the bed occupancy of the hospital for the respective month.
No. of files to be audited= 10% of the total bed occupancy for that particular month
So, the number of patient records to be audited ranges from 150-250 inpatient records every month. Person responsible for performing the audits is the Assistant Nursing Superintendent who is mainly concerned with auditing the Administration, Indenting & Dispensing errors. Then a report is prepared of the identified medication errors, broadly classified into Dispensing, Administration and Indenting errors , the report includes Zone, Ward, Patient name, Hospital number, Audit date ,Type of error, Remarks and the rate of medication errors which is calculated by the formula recommended as per NABH guidelines
Percentage of Medication Errors= (Total No. of Medication Errors/ Total No. of inpatient days) X100
The report is then submitted to the Nursing superintendent, who scrutinizes the report. After scrutinizing the report, it is sent to the quality dept. of hospital and to the chairman of the hospital safety committee.

Process Flow for Incident Reporting:
Any staff can fill the incidence reporting form (as and when they identify any medication error) The report is handed over to the Ward Incharge Nurse.The Ward Incharge gives it to the Asst. Nursing

Superintendent and the Asst.Nursing Superintendent submits it to the Nursing Superintendent.Nursing superintendent scrutinizes the report and sends it to Safety committee chairman and Quality Dept.

Limitations of the existing Procedure:
         The files audited varies every month so comparing the medication errors between different months is difficult and it is difficult to understand for the staff too. Prescription and Transcription errors in the inpatient departments are neither captured nor reported, which are potential causative factors to further errors.No standardized policy for file auditing & reporting.No standardized training to auditors, which may lead to varied perceptions while auditing and difference in the ways of reporting.Nurses write the drugs administered in nurses notes and it becomes difficult for the auditor to identify the errors. A systematic drug-chart would make the auditing easier.The incidence reports are submitted in hard copy only which may lead to delays in flow of the report and hence the actions may also delayed.
Objective 2: To Find Out Improvement Opportunities for Systematic Capturing and Reporting of Medication Errors.
         Based on the limitations of the existing process of capturing and reporting of medication errors, a checklist was designed through extensive literature review and expert suggestion which Included Prescription and Transcription errors in the auditing checklist & was used to audit and capture medication errors in 812 Inpatient records, with a view to improve the capturing of medication errors.
The files were audited from January 2016-April 2016 across all the Inpatient departments of the hospital. And the patient records were selected randomly.Total 203 files were audited every month.
         For Prescription errors: The data was collected from the doctors' orders. Prescriptions of the respective dates in which the audit was done were checked. Illegible handwriting was excluded from the criteria of medication errors as the policy of prescribing in Block letters was yet to be introduced in hospital.Doctor's notes were checked for spelling mistakes in drug names, whether the drug strength, drug form, frequency and route is mentioned or not. Prescribing in block letters was excluded as it is yet to be introduced as a policy in the hospital.In case of discrepancy detected in the prescription, the same was confirmed with the staff or resident available in the wards, then it was documented as an error.
For Transcription errors: The data was collected from the Nurses Notes, after comparing the notes with the doctor 's orders. In case of any discrepancy identifiedthe same was confirmed with the nursing staff available and then it was documented. Nurses 'notes were checked for the spelling mistakes, wrong drug, wrong frequency, wrong dose, wrong route, and wrong drug form.
For Administration errors: The auditing of administration errors was done by matching patient bedside medications with the prescriptions and patients we asked about the time of oral medications administered, and about the timings of injections administered.
If any discrepancy was found, the same was confirmed with the staff and then it was documented in the checklist. Checked for Wrong Drug (other drug), Wrong Time, Wrong Dose/strength, Wrong frequency, wrong route, wrong drug form, missed dose.
For dispensing errors: The data was collected after comparing the pharmacy bills with the prescriptions, enquiring the staff nurse for any dispensing errors and checking patient bedside medications and matching them with the prescriptions.
         In case of any discrepancy identified the same was confirmed with the staff available and then it was documented in the checklist.The details about the identified medication error was written in the remark's column of the checklist.
The findings were regularly shared with the hospital quality management representative as well. Checked for wrong drug, wrong dose, wrong form, expired drug, other (delayed dispensing which may lead to missed dose)

III. Result

Table 1: Medication Errors from January to April2016

MONTHS	Medication Errors	NO. OF FILES AUDITED
JANUARY	82 (40.4%)	203
FEBRUARY	79 (38.9%)	203
MARCH	89 (43.8%)	203
APRIL	60(29.6%)	203
	310(38.17%)	812

Table2: Classification Of medication Errors from January – April2016

Classification of Errors	JAN	FEB	MARCH	APRIL	TOTAL
Prescription	21	20	25	10	76
Transcription	28	37	33	21	119
Administration	20	13	21	10	64
Dispensing	13	9	10	19	51

Figure 2: Graphical Representation Of Classification Of Medication Errors (In Numbers) January-April2016
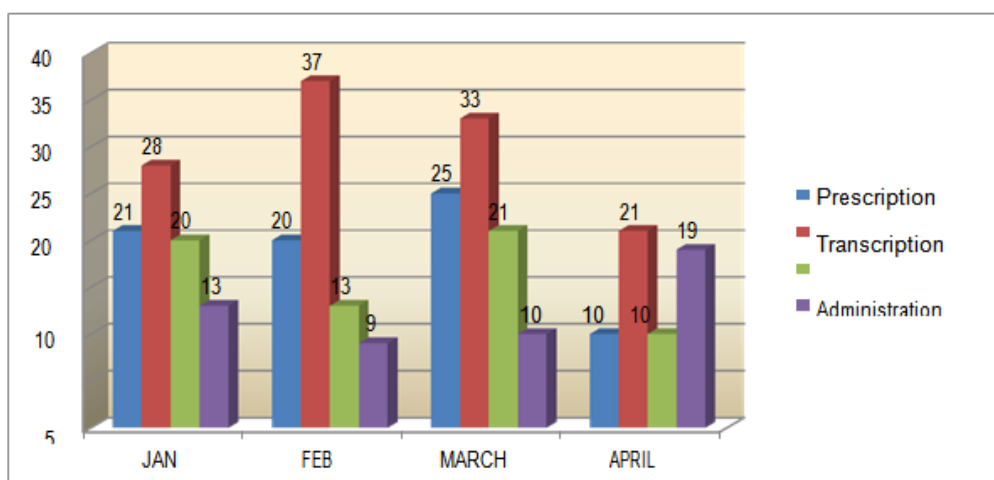

Table3: Percentage Of The Classification Of Medication Errors

Type Of Error	No. Of Errors	Percentage of errors
Prescription	76	25%
Transcription	119	38%
Administration	64	21%
Dispensing	51	16%

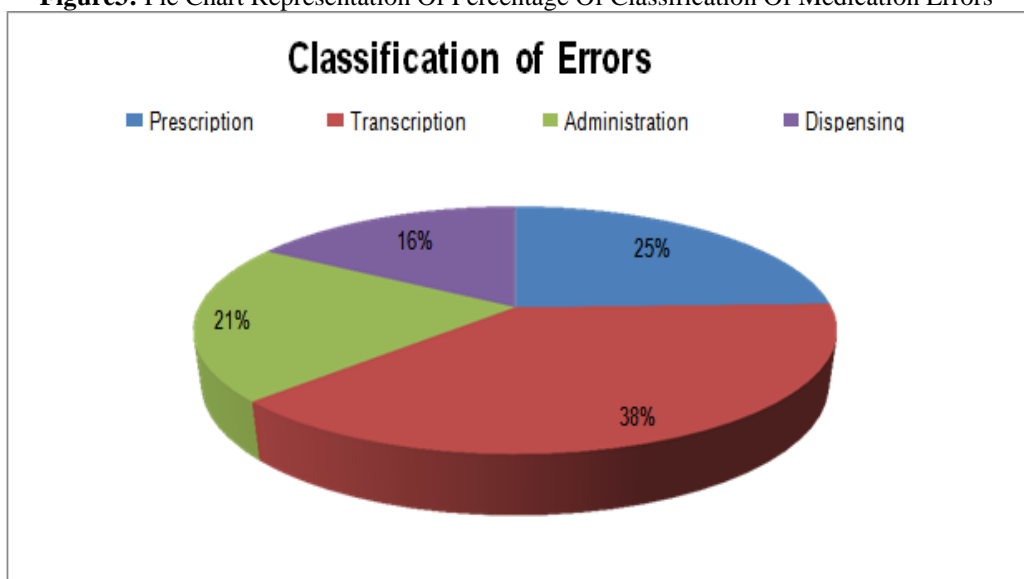**Figure3:** Pie Chart Representation Of Percentage Of Classification Of Medication Errors

Table4: Prescription Errors

Prescription Errors	January	February	March	April	Total
Drug name(spelling Mistakes)	10	9	12	6	37
Drug strength(Was not mentioned)	7	5	8	3	23
Drug Route(wasn't mentioned)	2	3	2	1	8
Drug Form	2	3	3	0	8

Table5: Transcription Errors

Transcription errors	January	February	March	April	Total
Wrong Drug(other drug)	3	5	1	3	12
Wrong Name(Spelling mistake)	10	14	16	9	49
Wrong Dose/strength	3	6	6	2	17
Wrong frequency	7	9	8	6	30
Wrong route/ route not mentioned	5	3	2	1	11

Table 6: Administration Errors

ADMINISTRATION ERROR	January	February	March	April	Total
Wrong Drug(other drug)	0	0	2	0	2
Wrong Time	6	8	10	7	31
Wrong Dose/strength	1	2	3	1	7
Wrong frequency	2	0	5	0	7
Wrong drug form	1	3	1	0	5
Wrong route	1	0	0	1	2
Missed dose	9	0	0	1	10

Table7: Dispensing Errors

Dispensing errors	January	February	March	April	Total
Wrong drug	2	1	3	5	11
wrong drug form	4	1	2	2	9
wrong strength	6	3	4	5	18
Expired	1	0	0	0	1
Others(delayed)	0	4	1	7	12

Total medication errors captured in a sample size of 812 files is 310.
Percentage of medication errors= (Total no. of medication errors in 4 months/ Total no. of inpatient days in 4 months) X 100
i.e. (310/162537) X 100 = 0.2%
And if we compare the official medication errors reported for the year 2015, for a sample of 812 files, we need to take the data of January to June 2015 if an average of 150 files were audited every month.

It shows that only 0.002% medication errors were captured with the existing method, which led to many medication errors being not captured and remained under-reported. Hence, we can say there is a significant improvement in capturing of medication errors by using the suggested too.

IV. Discussion

The reports of study showed, in the initial month the rate of medication errors captured was (40.4%) but the medication errors were identified more in the month of January (40.4%) and March (43.8%). The overall incidence of medication error was 38.2% which was in similar range when compared to other studies which ranges from 33.4% to % to 50.26%, the higher rates of errors may be due to higher sample size. The Prescription errors were 25%, Transcription errors were 38%, Administration errors 21%, Dispensing Errors 16%. The incidence of Transcription error was found highest in our study whereas when compared to other studies administration errors and prescription errors are higher that indicates towards more workload of nurses and most probably the nurse to patient ratio might be less.

The use of the medication error checklist increased the identification of medication errors for a sample size of 812 inpatients, from 0.002% to 0.2% which was a significant increase which would help the hospital to understand the various aspects where improvements are required to prevent medication errors as well it will help to build new policies for patient safety which will result in improved quality of patient care.

V. Conclusion

Errors are common in any system but as far as medication errors are concerned, they turned as a major threat to patient safety (7). They not only lead to increased hospital stay, cost of treatment and hospital stay but also increase the morbidity and mortality rates. Therefore identifying the causes and attempting to prevent medication errors got a great demand. Clinical pharmacist is the only trained professional in giving information to the patient and to intervene the prescribed regimen for better patient care (8). My experience confirms that a simple audit using a checklist can simplify the auditing of the patient records as well as standardize the reporting of medication errors to a great extent. If the hospital implements the suggested system, it will increase the quality of patient care and patient safety immensely (9).

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