

THE PHARMA INNOVATION

Prevalence of medication error in critical care unit of a tertiary care hospital: Current scenario in India

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Background: Medication error in developed countries is of essential concern when there is an issue of affliction to a patient's health, yet in under developing like India, it is only a period and its importance is underestimated. The frequency of medication error is vital to evaluate the clinical consideration provide in the medical care system.

Objective: The aim of the study is to evaluate the occurrence of medication error in critical care unit and to evaluate its risk consequences.

Materials and Methods: This is a planned study directed over a time of a half year in a critical care unit of a tertiary tertiary care hospital. Drug outline survey method was collected for data collection. The medication errors were primarily categorised as prescription, transcription, indenting, dispensing, and administration error. A sum of 5,405 charts were studied. The NCCMERP risk index was utilized to assess the result of errors.

Results: Out of the total 5,405 charts reviewed, 415 (7.6%) medication errors were found which makes 7.6%. Transcription error is found to be at peak with 44.87% followed by prescription and administration errors with 36% and 16.34%, respectively. The incidence of indenting and dispensing error is found to be very low with 1.2% and 0.2%, respectively. Thus, the commonest type of error is transcription error.

Conclusion: Major part of the errors are transcription errors followed prescription and administration errors. Doctors must be more careful during recommending and checking the medication charts. Clinical drug specialists should act as a barrier at each progression of prescription interaction to recognize and forestall medication errors.

Keyword: Intensive care, medication error, risk factor

INTRODUCTION: The National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP) has characterized medication error as "Any preventable occasion that might cause improper medicinal use or patient harm while the medicine is in the control of the medical health care professional, patient, or consumer. These occasions might be

connected with professional practice, health care products, methods, and systems, including endorsing, request correspondence, item naming, bundling and terminology, compounding, administering, appropriation, organization, schooling, checking, and use" ^[1]. Thus, any medicine error can be foreseen before it could possibly hurt the patient.

Medication error can be categorised in various ways. The most often involved characterization strategy in emergency clinic settings is as indicated by the stage at which error occurs during the time spent of medicine use, like solution, record, administering, organization, or observing. The other one is psychological classification that comprises of information-based error, rule-based error, activity based, error and memory-based error [2, 3]. The importance of medication error came to be known when Institute of Medicine (US) stated in, “To Err is Human; Building a Safer Health System,” that around 44,000 to 98,000 deaths in America occurred as a result of medical errors [4, 5].

The effect of medicine error on quiet's prosperity is impossible. The detailed clinical mistake is a tip of a chunk of ice of genuine rates happening in a medical services system [3]. Most of the prescription errors don't hurt any the patient, yet there are some that cause unjustifiable outcomes, including brief or extremely durable damage to the patient's wellbeing and prosperity, expanded length of hospitalization, expansion in cost of therapy, individuals losing confidence in medical care conveyance framework, and even deaths [6, 7].

Prof Jha in his study showed that around 5.2 million clinical error occurred in India yearly. Additionally, the British Medical Journal cited that India, similar to some other emerging nation, is recording a ton of clinical errors. The fundamental explanation being that we don't have prepared specialists and medical attendants to measure the clinical outcomes [8].

The purpose of the study is to work out the rates of prescription mistake in a basic consideration unit in light of its type and nature and to decide the most well-known error and its plausible underlying basis and result on patients' health.

Materials and Methods

The process followed in the hospital involving medication initiates with a physician writing the prescription after the patient's admission followed by placing the indent for the prescribed medication by the pharmacist/nurses to the hospital pharmacy. The pharmacy then dispenses the required medicines to the patient which is

then administered later by nurses. Next day, the prescription is transcribed by junior doctors and then checked and signed by the consultant doctors. Efficacy and safety of treatment are then monitored by the treating doctors. A medication error can occur at any of these stages or may occur at times on multiple stages directly affecting the patients' care and economic burden.

Study Design

A potential experimental study was conducted for a period of 6 months in the critical care unit of a tertiary care hospital.

Study Population

Patients admitted to the critical care unit during the study period regardless of age, sex, and diagnosis were involved in the study. Random method was used for sampling of the patients.

Data Collection

Two clinical drug specialists were chargeable for information assortment. Medicine outline audit technique was utilized to recognize medication errors. Complete 5,405 medicine graphs were surveyed. Aside from prescription outlines, patient's bedside meds, medicine bill, and to some extent utilized or void medication vial/ampoule and pill include if there should be an occurrence of oral medications were checked for distinguishing medication errors.

All the medication errors were for the most part arranged as remedy, record, indenting, apportioning, and organization mistakes. These medicine mistakes were additionally partitioned by their causes which include incomplete prescription, illegible prescription, wrong drug, wrong dose, wrong frequency, wrong route, wrong time, wrong formulation, wrong dilution, omission, and therapeutic duplication.

The result of medicine error was evaluated utilizing NCCMERP hazard file as portrayed in Table 1 [9]. Category A and class B consists of intercepted errors, whereas category C to category I are actual errors.

Results

Out of the total 5,405 charts reviewed, 415 (7.6%) medication errors were found which

makes 7.6%. Transcription error is found to be at peak with 44.87% followed by prescription and administration errors with 36% and 16.34%, respectively. The incidence of indenting and dispensing error is found to be very low with 1.2% and 0.2%, respectively. Thus, the commonest type of error is transcription error.

While further evaluating the causes of medication error, the most common cause found is due to incomplete prescription (ideal complete prescription includes dosage form, name, dose, frequency and route of drug) comprising 50% of the total errors, which is followed by wrong dose and wrong drug with 22% and 8%, respectively.

In case of prescription errors, the most common cause was incomplete prescription (48%), followed by illegible prescription (8.4%), and wrong dose (22.89%).

Administration errors are common due to wrong dose administration (22.89%) and omission error (4.8%). While evaluating wrong dose it was found that almost all the errors occurred due to underdosing.

Majority of the medication errors are due to the drugs belonging to the class antibiotic (38%), followed by anti-hypertensive (48%), and analgesic drugs (45%). The highest incidence of medical errors due to antibiotics is a matter of concern.

None of the medication error caused any significant damage such as temporary or permanent damage and death of the patient. Majority of the errors come under the category B of error outcome, that is error occurred but did not reach the patient.

Discussion

The principal reason for this study was to decide the rate of medication error in light of their categories and results. On additional examination, it has been seen that the benchmark for medication error varies in each association. Essentially, it relies upon the comprehension of what goes under medication error, their detailing and practices continued to forestall and decrease them.

The consequence of this study has shown that lesser percentage of medication error happened

in the basic consideration unit of the emergency clinic. This finding was low when contrasted with a comparative report in West Ethiopia (Mohammed *et al.*) and India ^[10, 11]. The main consideration for low paces of prescription error is underreporting. At the point when further broke down it has been seen that aside from clinical drug specialists, no other medical services supplier announced any medication error, and self-revealing was not apparent. The degree of comprehension and information among specialists and attendants in regards to medication error identifiable proof and announcing was negligible. The anxiety toward burden and abandon has been the central issue among the medical care experts prompting lower clinical mistake revealing. A framework that energizes error specifying ought to be founded through fulfilling or liking self-announcing and beginning safety climate for medical care personnel ^[12]. Organization should be without fault and should work in agreement to work with open communication ^[13]. Hospital certification requires revealing of drug error as a consistent quality improvement device that could be useful in expanding error announcing rate.

Predictable with previous exploration, there is a remarkable record error in our study ^[14]. Incomplete medication is the significant justification behind record error. In the majority of the solutions, portion of the medication was missing, which at last brought about postponement and organization of wrong portion to the patient. In our setting, junior specialists decipher prescriptions on request outline. Their absence of involvement and insufficient information have additionally advanced the possibilities of errors. They should have full information in regards to the treatment given to the patient and ought not simply reorder from past requests. In any case, practically all the record mistakes have been forestalled before they could arrive at the patient through ideal ID and intercession by clinical drug specialists and advisor specialists.

The step of solution error in present study imitates to the analysis made in the United Kingdom of medication errors ^[15]. Prescription

errors were for the most part because of deficient and indecipherable solution. This finding is like the study conducted by Venkateswar in Tamil Nadu [16]. Incomplete medicine composing prompts fragmented record. This could be handily forestalled in the event that medicines are written in an optimal complete arrangement in neat hand-writing. Utilization of Computerized Physician Order Entry (CPOE) could be helpful in diminishing endorsing errors and in expanding consistence to finish prescription [17].

Our study revealed lower percentage of organization error which is similarly low when contrasted with the study done by Patel *et al.* [18]. Wrong portion (under-dosing) and oversight mistake are the most widely recognized purposes behind organization error. Wrong portion organization eventuates when single portion is controlled rather than different dosages of vials/ampoules. Clinical drug specialist could assume a vital part in forestalling such mistakes by just featuring taking drugs diagram the quantity of portions to be regulated.

The most widely recognized class of medications persuaded to error are antibiotics, antihypertensives, and analgesics, which is like the findings of study done by Zeleke *et al.* [19]. The plausible explanation is on the grounds that these are the most recommended drugs in basic consideration unit. Meropenem, telmisartan, and paracetamol are the medications generally associated with medication error. It is a matter of concern that medication error principally including expansive range anti-infection (under-dosing) may fundamentally add to antimicrobial obstruction.

The result of the error in our study was estimated utilizing NCCMERP hurt score record with larger part of the error in class B and classification C. On opposite, a study in West Ethiopia experienced greater part of the errors in class C trailed by classification B [11]. No fatal loss has been seen because of medication error. A large portion of the error have been forestalled before they could arrive at the patient. This is a direct result of the dynamic investigation by clinical drug specialist on each progression of medicine process.

Table 1: NCCMERP Index for categorizing medication errors

Category Description	Inference
Events have the capacity to cause error	No error
An error occurred but not reached the patient	Error, No harm
An error reached the patient but did not cause potential harm	Error, No harm
An error reached the patient and required monitoring	Error, No harm
An error occurred that resulted in temporary harm to the patient and required intervention	Error, harm
An error occurred that resulted in temporary harm to the patient and required initial or prolong hospitalization	Error, harm
An error occurred and resulted in permanent patient harm	Error, harm
An error occurred and resulted in patient’s death	Error death

Table 2: Frequency of types of medication errors

Type of error	Number of cases	Percentage
Transcription error	184	36
Prescription error	145	44.87
Administration error	67	16.34
Indenting error	5	1.21
Dispensing error	1	0.24

Table 3: Frequency of causes of medication errors

Causes	Number of cases	Percentage (%)
Incomplete prescription	200	48.1
Wrong dose	95	22.89
Wrong drug	35	8.4
Illegible prescription	35	8.4
Omission	20	4.8
Therapeutic duplication	8	1.9
Wrong dosage form	7	1.6
Error prone abbreviation	2	0.4
Wrong dilution	4	0.96
Wrong duration	3	0.72
Wrong frequency	3	0.72
Wrong time	1	0.24
Wrong route	2	0.48

Table 4: Distribution of medication classes involved in medication error

Drug class n (%)	n (%)
Analgesic	45 (19.23)
Antacid and Antiemetic	30 (13.4)
Antibiotic	85 (38.11)
Antiepileptic	18 (8)
Anti-hemorrhagic	4 (1.7)
Antihistamine	3 (1.3)
Antihypertensive	48 (21.52)

Table 5: Frequency of medication errors according to NCCMERP risk index

Outcome error	Number of cases	Percentage
A	5	1.3
B	321	84.4
C	54	14.21

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