

Assessment of inpatients omission errors made by nurses throughout the medication administration process

Abstract

Objective: This study was designed to evaluate the omission errors in a tertiary care hospital Quetta, Pakistan.

Material and methods: The study was prospective analysis of treatment slips. Assessment was done by Pharmacist during (July-November 2017). The data of the study was collected from the treatment slips of all admit patients to odd number of beds in pediatric medicine ward of BMCHQ, Pakistan. The data was collected by visiting 3 shifts (morning, evening and night), recorded in the data collection form, analyzed and interpreted.

Results: The total omission errors were 12056 (74.43%), out of which most of the omission errors were in the month of September 2017 the omission errors 3485 (28.90%). Most of the omission errors were 7632 (63.30%), found in male patients than female. The omission errors in morning shift were 5624 (46.64%), followed by evening shift 1456 (12.07%) and in night shift 4976 (41.27%). the most of omission errors in age group 1year-5years were 5454 (40.98%), followed by <1 years of age group was 3311 (27.46%), 5years-10years 2027 (16.81%) and in the age group of >10 years & above 1264 (10.48%).

Conclusion: The rate of omission errors was very high percentage in inpatients setting. Most of the omission errors were found in the morning and night shifts which indicate that the nurses of both shifts were responsible for these errors.

Keywords: inpatients, omission errors, pharmacist, tertiary care hospital, quetta, Pakistan

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Introduction

Omission error defined as, failure to administer an ordered dose to a patient according to the American Society of Health-System Pharmacists.¹ Medication errors (prescribing, transcribing, dispensing and administration errors) are an important cause of patient morbidity and mortality.² Medication administration errors are a common sub-type of medication errors and accounted for 34% of errors in one large USA study conducted in medical and surgical units. A recent report of the Institute of Medicine suggests that at least 44,000 and perhaps as many as 98,000 Americans die each year in hospitals as a result of medical errors.³ Over half of these errors were medication errors, defined as any preventable event that may cause, or lead to, inappropriate medication use or patient harm while the medication is in the control of the health care professional or patient.⁴ Observational studies in general hospitals have yielded error rates varying between 3.5 and 27% of doses.⁵⁻⁸ Direct observation detects medication administration errors at a much higher rate than chart review or incident report review.⁸ The observational method has been demonstrated to be valid and reliable.⁹ A review of drug administration errors detected by the observation technique¹⁰ revealed methodological limitations in studies evaluating the administration process: no standardized definition of error types and error rate, lack of information about the selection method of nurses observed and number of nurses observed, the level of experience of nurses, the number of patients or information on the observation technique.^{5,8,11-23} Nurses may spend up to one third Pepper²⁴ of their time on medication-related activities, and because of the relative lack of safeguards to prevent MEs, both nurses and patients are placed at high risk during this stage of the medication use process (Elliott and Liu 2010).²⁵ The observation technique has been described as one of the better methods for the detection of MAEs.^{26,27} In March 2017, we published the first

observation, pre and post intervention based study of medication administration errors carried out in a pediatric ward.²⁸ It is the first study in Pakistan which conducted in the pediatric inpatients by the way of assessment of omission errors. The objective of this study was to evaluate the omission errors in pediatric medicine ward.

Material and methods

Study design: This was prospective analysis study using the observation technique as described by the American Society of Health system pharmacists.

Study setting: The study was conducted in pediatric medicine ward of Bolan Medical Complex Hospital, a tertiary care hospital, Quetta, Pakistan.

Sampling technique: The medicine omission errors of all admit patients to odd number of beds (1,3,5,7,9.....) were assessed.

Duration of study: The study duration was July-November 2017.

Medicine administration mistakes were conceded out in a data collection form by Pharmacist.

Data instruments: The same data collection form used which was introduced by Ahmed, Haq et al.,²⁹ modified and this time only omission errors were recorded.

Study procedure

The data of the study was collected from the treatment slips of all admit patients to odd number of beds in pediatric medicine ward of BMCHQ, Pakistan. The data was collected by visiting 3 shifts (morning, evening and night), recorded in the data collection form by pharmacist, analyzed and interpreted.

Data analysis

The frequency and percentage was recorded. The related samples One Sample Chi-Square and One Sample Binomial tests were applied to observe the statistical differences, the P-value ($P < 0.05$) considered as significant by set confidence interval 95% by using SPSS 22.

Ethical approval

Prior permission was taken from the Medical Superintendent of BMCHQ, Pakistan.

Results

Demographic Characteristics Vs Drug Administration; the total drug administration's were 16196, out of which the drug administration in the month of July 2017 was 3737 (23.07%), in August 2017 drug administration was 4568 (28.20), in September 2017 the drug administration 431 (26.64) and in October 2017 the drug administration was 3578 (22.09%). The drug administration to male patients was 10060 (62.12%) and drug administration to female patients was 6136 (37.88%). The drug administration in different age groups; less than 1 years of age group was 4710 (29.08%), 1 year -5 years 6759 (41.74%), 5 years-10 years 2403 (14.84%) and in the age group of 10 years & above 2324 (14.34%). The drug administrations in morning shift were 7575 (46.76%), in the evening shift 2390 (14.75%) and in night shift 6234 (38.49%) as showing in Table 1. Omission Errors Distribution; the total omission errors were 12056 (74.43%), out of which the omission errors in the month of July 2017 were 2485 (20.61%), in August 2017 omission errors was 3410 (28.28%), in September 2017 the omission errors 3485 (28.90%) and in October 2017 the omission errors were 2676 (22.19%). The omission errors to male patients were 7632 (63.30%) and omission errors to female patients were 4424 (36.70%). The omission errors in morning shift were 5624 (46.64%), in the evening shift 1456 (12.07%) and in night shift 4976 (41.27%). The omission errors in different age groups; <1 years of age group was 3311 (27.46%), 1 year-5 years 5454 (40.98%), 5 years-10 years 2027 (16.81%) and in the age group of >10 years & above 1264 (10.48%) as presentation in Table 2.

Table 1 Demographic characteristic vs drug administrations

Drug administration's (N=16196)		
Description	Frequency	Percent
Months		
July 2017	3737	23.07
August 2017	4568	28.20
September 2017	4313	26.64
October 2017	3578	22.09
Gender		
Male	10060	62.12
Female	6136	37.88
Age Groups		
<1 year	4710	29.08
1- 5 years	6759	41.74
5-10 years	2403	14.84
10 years &>	2324	14.34
Shifts Wise		
Morning	7575	46.76
Evening	2390	14.75
Night	6234	38.49

Table 2 Omission errors distribution

Omission errors distribution (N= 12056)			
Description months	Omission errors	Percent	Significance level (p<0.05) one sample Chi-Square test
July 2017	2485	20.61	0.001
August 2017	3410	28.28	0.001
September 2017	3485	28.90	0.001
October 2017	2676	22.19	0.001
Gender			
Male	7632	63.30	0.001
Female	4424	36.70	0.001
Shift Wise			
Morning	5624	46.64	0.001
Evening	1456	12.07	0.001
Night	4976	41.27	0.001
Age Group			
< 1 year	3311	27.46	0.001
1- 5 years	5454	40.98	0.001
5-10 years	2027	16.81	0.001
10 years & above	1264	10.48	0.001

Discussion

Most of the drugs administration and omission errors were found in the day and night shifts, because most of the drugs administered twice daily. One of the real reason was that the shortage of nurses in the morning and night shifts. Nurse ratio to patient in the morning shift 1:15 and in the night shift 1:45. A small number of studies have examined the medication errors at the administration stage, especially in Pakistan hospitals. Our observation based studies were probably the first time performed in Pakistan. In a study of pediatrics ICUs and neonatal,³⁰ reported 315 medication errors (detected by the incident-report technique), from among 2147 admissions during a 4-year period. of these errors, 60.3% were attributed to nurses and 57% of 190 nurses' errors were due to omission, wrong rate of administration or wrong time.³⁰ But in the present study the omission errors rate was (74.43%). The error rate was and 27.6% in the study performed by Ghaleb et al.,³¹ and 31.3% in the study executed by Prot et al.⁸ But if comparison made with recent studies the result of existing study was contradictory to the studies performed by Prot et al.,⁸ Ghaleb et al.,³¹ because in the present study overall errors rate was (74.43%). But the present study supported the result of earlier studies perform by the tanzeel. The omission errors were (98.34%) in the pre intervention²⁹ and (80.78%). The errors of omission was the most common (41%).² But in the existing study omission errors were 12056 (74.43%).

However, because we focused on administration of drugs, our observations show the following error origins;

Lack of knowledge in use of drugs: Nurses are not always knowledgeable regarding the nature and volume of diluents, administration techniques, rates and schedules of administration, physicochemical incompatibility, and specific form (e.g. extended-release tablets). Lack of standardization of protocols for preparation and administration; Since each nurse prepares and administers medicines according to his/her knowledge and habits, there is a heterogeneity of practice (e.g. i.v. ranitidine incorrectly administered after dilution in

5% glucose), except for some drugs such as insulin, catecholamines, general anaesthetics and curare. In appropriate use of medical devices; Technical specificity of medical devices for intravenous administration is steadily increasing and diversifying and the lack of staff training and protocols in this area are also risk factors. Lack of the presence of a pharmacist; this is true not just for our hospital, but for most other French hospitals as well. The role of the French hospital pharmacist is fundamentally different from that of our Anglo-Saxon counterparts. The ideas that the pharmacist must have personal contact with the patients, and that she/he has a hand in training nursing staff, are new, and not accepted by the French medical community. Neither physicians nor nurses take advantage of the pharmacist as specialist, even though her/his impact on the quality of care has been extensively documented.³²⁻³⁵ Lack of programs for the detection and prevention of errors: Once an error occurs, it is never officially reported, because our hospital, like most French (and perhaps European) hospitals, does not have a detection program such as that described by Ciminera & Lease.³⁶ On the contrary, the overall attitude is to conceal the error for fear that it would reflect badly on personal reputations or that of the unit. Because of these identified causes of error, our pharmacists have instituted specific changes for reducing errors: (1) presence of a pharmacist in the pediatric ward (half-day a week), (2) nurses and medical teams now consult this pharmacist with little hesitation, (3) he has provided nurses with a standardized protocol of i.v. antibiotic administration, (4) he has recorded the most frequently used oral forms of medication and has proposed an alternative to crushing solid oral forms when it is possible.

Recommendations

In the contrast of present study the following recommendations must be;

The learning and training programs of nurses should be on medication errors.

Pharmacist should be present for 24 hours in ward for the betterment of patient health.

The nurse's staff should be increase in the ward due to the workload.

Conclusion

The rate of omission errors was very high percentage in inpatients setting. Most of the omission errors were found in the morning and night shifts which indicate that the nurses of both shifts were responsible for these errors. In most cases, the nurses were either unaware of the existence of their errors, or they were aware but did not report them, because they did not think they were serious in nature; or the medication error remained undetected, because no link was made between the clinical event and a possible medication error. Most of the omission errors were found in the age group between 1-5years of age and most of the omission errors were found in male patients than female which is the challengeable for the patient safety. These changes will lead to an improvement in quality of care and a decrease in secondary costs due to poor use of medication.

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Conflict of interest

The author affirmed that they have no clash of interests.

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