

# ERRORS IN MEDICATION IN A PEDIATRIC WARD

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## ABSTRACT

*Iatrogenic errors in medication were studied in a busy pediatric ward. The study was based on voluntary reporting of errors noticed by the doctors and nurses in the ward. The error rate was 6.4%. Prescription errors accounted for 37.7% of the errors and 2 of these were potentially fatal. Dispensing errors and missed dosages were other frequent errors. Overcrowding in pediatric wards is an obstacle to optimum patient care. Adequate number of nurses and support of pharmacists is essential for safe and optimum drug therapy.*

**Key words:** Medication errors, Drug therapy, Prescriptions.

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Non-compliance and iatrogenic errors in medication is an important cause of treatment failure(1-3). In developing countries it is compounded by overpopulation, poverty and ignorance.

In the hospital all the drugs a patient is given are normally under the control of the treating physician, and patient compliance especially in the pediatric age group can be ensured to maximum. Nevertheless, errors may occur and wrong drug or dose be given to the patient(4). In infants and children a greater magnitude of errors is likely to occur because of small body size and calculation of doses on the basis of weight. Despite correct diagnosis, such errors may result in treatment failure and complications in seriously ill children.

## Material and Methods

The study was conducted in an indoor general pediatric ward of Kalawati Saran Children's Hospital, during the period of May and June, 1990. It is a busy hospital with separate Pediatric Casualty and Intensive Care Unit. Bed occupancy ranges from 100 to 150% in summer. Prescriptions in the indoor case records are generally written by resident staff.

For the purpose of study all the doctors and nurses were told to report any error observed in prescribing, preparing and giving out medicines. No special effort was made to record the number of drugs prescribed or to look for medical error during this period. Medication was given in form of intravenous, intramuscular and oral/intragastric routes. Monitoring of intravenous fluid and ORS was not included in this study.

All reports were brought to the notice of the authors within 24 hours and were confirmed by the erring person. Since the whole exercise was non-punitive in nature,

there was complete co-operation from the staff.

## Results

During the study period, 700 patients were admitted. The daily census ranged from 46-111 in the ward which has a bed strength of 50. Twelve nurses were posted for round the clock services in this ward. Average bed occupancy during this period was 147%. Forty five medication related incident reports were made during the 2 months study period. Failure to respond to the standard treatment protocol and appearance of fresh symptoms which could be ascribed to toxicity of the prescribed drugs were the main pointers which led to detection of errors. However, some errors were observed during routine ward rounds and by nurses while giving medication.

Most of the reports were made by doctors and nurses. Five reports regarding missed dosages were made by the parents. The incidents involved dispensing errors, prescription errors and clerical errors. The error rate was 1 per 15.5 admissions (6.4%).

Dispensing errors and clerical errors were attributed to nurses. These accounted for 62.2% of all errors (*Table*). Incorrect measurement of the drug was the most common mistake followed by omission in drug dosages and errors in copying doctor's instructions. Most of these errors were serious in nature considering the patients were sufficiently sick to be hospitalized. However, none of the errors made by the nurses was potentially fatal.

The drugs implicated in the observed medication errors included injectable preparations of digoxin, propranolol, gentamicin, phenobarbitone and aminophyllin and oral preparations of nalidixic acid,

**TABLE—Observed Errors in Medication**

	No.	%
<b>A. Prescription Errors</b>		
(i) Wrong dose	17	37.8
Misplacement of decimal point	3	
Inappropriate dose for the particular disease	4	
(ii) Inappropriate way of prescribing	10	
<b>B. Dispensing Errors</b>		
(i) Incorrect measurement of the drug	12	
(ii) Missed dosage	6	
(iii) Inappropriate route and mode of administration	2	
<b>C. Clerical Errors</b>		
(i) Errors in copying out doctors instructions	6	
(ii) Mistaken identity of patient leading to administration of unauthorized drug	2	

iron, diphenyl hydantoin and chloramphenicol.

## Discussion

There is paucity of data on the incidence of medication errors in pediatrics(1-4). Since the present study was based on voluntary reporting, it is likely that the frequency of errors was much higher. Besides the error rate would have been higher, if we had included intravenous fluids and ORS. Although the prescription errors were fewer than the other types of errors, these were more life threatening than errors attributed to nurses. Misplacement of the decimal point while calculating the dose is a potentially fatal error(1). This was observed with drugs like digoxin and propranolol.

Inappropriate method of prescribing

drugs is another serious error which can lead to problems in medication. Prescribing injections in millilitres instead of milligrams without mentioning the strength of injections is an error, often made by doctors. Prescribing syrups in teaspoons is another inaccurate way of prescribing because variable size of spoons are used resulting in inadequate or excessive dose. Variability in the strengths of market preparations of commonly used drugs is another factor causing errors. It is, therefore, desirable to have uniformity in strengths of medicines used in the hospital. Physicians should restrict their prescription to those medicines with which they are familiar.

Of the errors made by the nurses, omission of drugs was perhaps the most serious error. Missed dosages may prove to have serious consequences in a disease like bacterial meningitis.

Overcrowding and lack of adequate number of nurses is obviously an important factor which can result in missed dosages as well as other errors, which may be true of any pediatric ward in a tropical country where nurse/patient ratio is far from optimal. No case of delayed drug administration was reported. It is possible that it was not considered to be serious enough to the reporting personnel.

The problem of mistaken identity can occur if two patients of the same name are kept in the same room. These can be easily avoided if extra precaution is taken to confirm the identity.

Miscalculation by the nurses in converting the milligrams of the prescribed medicine into exact volume as millilitres may lead to less or more dosage in injections. This is especially true of injections which are available in highly concentrated form and require dilution if small doses are

dispensed *e.g.*, injection phenobarbitone. At the same time it was observed that the nurses were not careful while dispensing oral medicines which were prescribed appropriately in millilitres of a specific preparation.

The pharmacists can play a crucial supportive role in preventing errors in medications. At present the role of pharmacists in our hospital is very limited. Clinically trained pharmacists should assume responsibility for safe, rational drug therapy, and for supervision of prescriptions and monitoring of serum drug levels. There should be periodic in-service training of the nurses, pharmacists and physicians.

We strongly feel that a systematic evaluation of the quality of the work is important. But it should be noted that the analysis should be constructive and supporting. The main purpose is to try to realize from our mistakes—this itself would lead to a reduction in errors which would ultimately result in better patient care. Many deficiencies have improved in our ward since these errors were noticed. We strongly recommend that syrups and suspensions should be prescribed in milligrams or as a millilitres of a specific preparation. The precise way of prescribing oral medicines shall motivate the nurses to dispense it in exact quantity with a proper graduated measure such as syringe without needle. Short prescriptions with minimum number of drugs and simple and clear instructions may also minimize the errors. Mothers can be involved to monitor the drug administration in a busy hospital. An alert mother can bring to notice of the nurses the delay in administration or missed dosage. Besides, during hospitalization if the mother is taught the importance of giving the precise amount of oral medication the drug compliance after discharge

shall also improve. Although the frequency of serious errors was quite low, however, it is a cause of concern that a few errors were serious with possible life threatening consequences. A zero error will probably remain a goal to be achieved.

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