



**TO IDENTIFY MEDICATION ERRORS IN TREATMENT CHART  
IN PEDIATRIC AND MEDICINE UNITS OF A TERTIARY CARE  
TEACHING HOSPITAL IN DAVANGERE**

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**ABSTRACT**

The research was carried out to study the medication errors in the treatment chart of the patients who were admitted in the pediatrics and medicine units of a tertiary care teaching hospital in Davangere. A total 100 cases were collected in which 124 medication errors were identified, among 124 medication errors 51(41.12%) were drug given without indication, 19(15.32%) were drug duplication, 31(25%) were over dose, and 23(19%) were under dose. The study shows that the age group of 1 month to 5 years was having maximum number of medication errors, i.e. 44.35% in which maximum number drug given without indication was found to be 33.34%. Improper dose includes over dose 80.64% and under dose, 69.56% were identified more in the pediatric unit than medicine unit. 63.16% of drug duplication were found in medicine unit than in pediatric unit which was 36.84%.

**KEYWORDS:** Medication errors, drugs given without indication, drug duplication, over dose and under dose.



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## INTRODUCTION

The definite goal of drug therapy is to achieve a defined therapeutic outcome that improves a patient's quality of life while minimizing patient risk<sup>1</sup>. Recently medication error events received significant attention due to its substantial mortality, morbidity and additional financial burden. Many studies reports that nearly one third of adverse drug events (ADEs) are associated with medication errors and are thus preventable<sup>2</sup>. Medication error is 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, patient and consumer<sup>1,3,4</sup>. Medication error has significant consequences on a personal and corporate level. On a personal level, patients suffer longer hospital stays, loss of income, significant social and family disruption, additional financial costs, disability or even death. The financial and emotional burden also frequently extends to the patient's family. Medication error may also effect in terms costs to the employer arising from re-education and training of the paramedic, support for the paramedic if stress or sick leave ensues, and redeployment to off-road duties if the paramedic does not regain his/her clinical confidence<sup>5</sup>. Medication errors should be identified and documented and their causes should be studied in order to develop systems that minimize recurrence. Several error monitoring techniques exist (e.g., anonymous self-reports, incident reports, critical incident technique, and disguised observation technique) and may be applied as appropriate to determine the rates of errors<sup>1</sup>.

According to McGovern the ten „golden rules for the safe administration of medication are<sup>1, 5</sup>:

- Administer the right drug
- Administer the drug to the right patient

- Administer the right dose
- Administer the drug by the right route
- Administer the drug at the right time
- Teach the patient about the drugs they are receiving
- Take a complete patient drug history
- Find out if the patient has any allergies
- Be aware of potential drug/drug interactions
- Document each drug administered.

## MATERIALS AND METHODS

The prospective observational study was conducted for a period of 6 months at Medicine and Pediatric wards in a tertiary care teaching hospital in Davangere after obtaining necessary approval from the institutional ethics committee. The data were collected from in-patient medication charts that were admitted in medicine and pediatric units and excluded pregnant woman and neonates. The collected data were checked to identify drug given without indication, drug duplication, over dose, and under dose. All the data were represented in percentages. Appropriate statistical test was used.

## RESULTS AND DISCUSSION

A total 100 cases that met the inclusion criteria were collected during the study period and analyzed to identify medication errors in pediatric and medicine units. Among these subjects 52(52%) are male, 24(24%) from pediatric unit, and 28(28%) from medicine unit and 48(48%) are female, 26(26%) from pediatric unit and 22(22%) from medicine unit.

**Table 1**  
**Total number of subjects distribute according to gender in department wise**

Units	Number of patients	Percentage
Pediatrics male	24	24%
Pediatrics female	26	26%
Medicine male	28	28%
Medicine female	22	22%

Out of 100 cases, 124 medication errors were identified, among 124 medication errors 51(41.12%) were drug given without indication, 19(15.32%) were drug duplication, 31(25%)

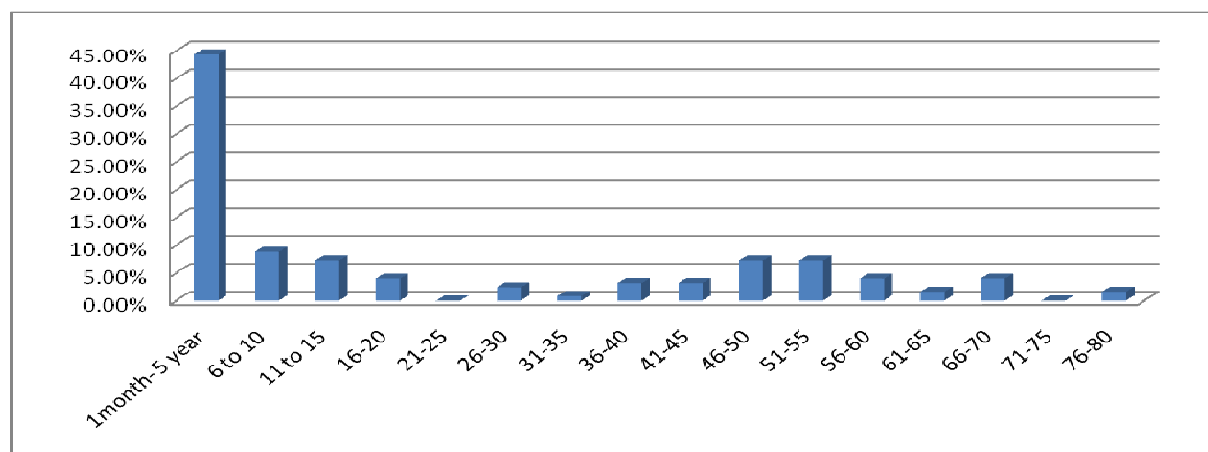
were over dose, and 23(19%) were under dose whereas a study conducted by Pote S et.al. found 4(2.6%) under dose and 11(7%) over dose<sup>6</sup>.

**Table 2**  
**Distribution of medication errors**

Medication Error	Frequency	Percentage
Drug given without indication	51	41.12%
Drug Duplication	19	15.32%
Over dose	31	25%
Under dose	23	19%

Out of 124 medication errors, maximum number of medication errors was identified in patient age group of 1 month to 5 years i.e. 55 (44.35%).

**Figure1**  
**Distribution of medication errors according to age groups**



Among the 124 medication errors, 51 were drug given without indication. In our study, pediatric patient of 1 month to 5 year age group were having a higher incidence of drug given without indication i.e. 17 (33.34%) .

**Table 3**  
***Distribution of drug given without indication age wise***

<b>Age in years</b>	<b>Drug given without indication frequency</b>	<b>Drug given without indication percentage</b>
1month- 5 year	17	33.34%
6-10	6	11.76%
11-15	6	11.76%
16-20	3	5.89%
21-25	0	0.00%
26-30	2	3.92%
31-35	1	1.96%
36-40	2	3.92%
41-45	0	0.00%
46-50	5	9.80%
51-55	4	7.84%
56-60	1	1.96%
61-65	0	0.00%
66-70	3	5.89%
71-75	0	0.00%
76-80	1	1.96%

Drug given without indication were observed in this study which can be due to negligence and lack of time to examine case by the medical practitioner. Adverse drug reactions and adverse events and other drug related

problems may occur as its result. Thereby it results in pharmaco- economic burden to the patient. Out of 124 medication errors, 19 were drug duplication which is shown according to age wise in the below given table no.4.

**Table 4**  
***Distribution of drug duplication age wise***

<b>Age in years</b>	<b>Drug duplication frequency</b>	<b>Drug duplication percentage</b>
1month- 5 years	2	10.52%
6 - 10	2	10.52%
11-15	1	5.27%
16-20	2	10.52%
21-25	0	0.00%
26-30	1	5.27%
31-35	0	0.00%
36-40	2	10.52%
41-45	2	10.52%
46-50	1	5.27%
51-55	1	5.27%
56-60	2	10.52%
61-65	0	0.00%
66-70	2	10.52%
71-75	0	0.00%
76-80	1	5.27%

31 medication errors were identified as over dose which is shown in the table no.5. In our study, the incidence of over dose was found maximum in 1month-5year age group 22 (70.96%).

**Table 5**  
***Distribution of over dose age wise***

<b>Age in years</b>	<b>Over dose frequency</b>	<b>Over dose percentage</b>
1month- 5 years	22	70.96%
6 - 10	2	6.45%
11-15	1	3.23%
16-20	0	0.00%
21-25	0	0.00%
26-30	0	0.00%
31-35	0	0.00%
36-40	0	0.00%
41-45	1	3.23%
46-50	1	3.23%
51-55	2	6.45%
56-60	1	3.23%
61-65	1	3.23%
66-70	0	0.00%
71-75	0	0.00%
76-80	0	0.00%

23 medication errors were identified as under dose which is shown in the table no 6. In our study, the incidence of under dose was found to be more in 1month-5year age group 14(60.87%).

**Table 6**  
***Distribution of under dose age wise***

<b>Age in years</b>	<b>Under dose frequency</b>	<b>Under dose percentage</b>
1month- 5 years	14	60.87%
6 – 10	1	4.35%
11-15	1	4.35%
16-20	0	0.00%
21-25	0	0.00%
26-30	0	0.00%
31-35	0	0.00%
36-40	0	0.00%
41-45	1	4.35%
46-50	2	8.69%
51-55	2	8.69%
56-60	1	4.35%
61-65	1	4.35%
66-70	0	0.00%
71-75	0	0.00%
76-80	0	0.00%

In this study, we identified that the age group of 1month to 5years of patients exposed to improper dose. It can be due to lack of knowledge and skill about the paediatric dose and dosage form by health care professionals and most of the drugs available in market in unit dose contain adult dose of drug. Therefore there are necessary to adjust drug dose according to the age and weight of the patient

and continues medical education program also workshop conduct to improve pediatric dosing system. Out of 54 improper dose (over dose and under dose) includes more frequency 15(27.8%) belongs to class analgesics and antipyretics, and followed by aminoglycoside 9(16.67%), 6(11.11%) corticosteroid other classes were represented in Table no. 7.

**Table 7**  
***Distribution of Medication classes involved in improper dose***

<b>Class</b>	<b>Frequency</b>	<b>Percentage</b>
Cephalosporin	6	11.11%
Anti- amoebic	1	1.85%
Analgesics & Antipyretics	15	27.78%
H2 antihistamines	4	7.40%
Tetracyclines	1	1.85%
Penicillin	2	3.71%
Anti-malarial	4	7.41%
Macrolide	1	1.85%
Aminoglycoside	9	16.67%
Diuretics	2	3.71%
Calcium channel blocker	1	1.85%
Antiplatelet	2	3.71%
Central sympathomimetics	1	1.85%
Histaminergic Agonists	1	1.85%
Primarily bactericidal	1	1.85%
Gall stone solubilizing agent	1	1.85%
Methylxanthines	1	1.85%
Proton pump inhibitors	1	1.85%

Out of 51 drug given without indication includes high frequency 8 (15.70%) belongs to class anti-malarial and anti-amoebic, and followed by analgesics and antipyretics 5(9.80%), 4(7.84%) belongs to anti-emetics, other classes were represented in table no. 8

**Table 8**  
***Distribution of Medication classes involved in drug given without indication***

<b>Medication class</b>	<b>Frequency</b>	<b>Percentage</b>
Anti-malarial	8	15.70%
Antipruritic	1	1.96%
Calcium supplement	2	3.92%
Magnesium supplement	1	1.96%
Anti-emetics	4	7.84%
Nasal decongestant	1	1.96%
Anti-amoebic	8	15.70%
Ulcer protective	1	1.96%
Tetracycline	2	3.92%
H2 blockers	2	3.92%
Proton pump inhibitors	2	3.92%
Penicillin	1	1.96%
Cephalosporin	1	1.96%
Skeletal Muscle Relaxants	1	1.96%
Diuretics	1	1.96%
Benzodiazepines	1	1.96%
Bronchodilators	1	1.96%
Anti-epileptics	4	7.84%
Anthelmintics	1	1.96%
Antispasmodic	1	1.96%
Analgesics & Antipyretics	5	9.80%
Macrolide antibiotic	1	1.96%
Nonbenzodiazepine hypnotics	1	1.96%

Out of 19 drug duplication includes more frequency 8(42.13%) belongs to class analgesics and antipyretics, and followed by cephalosporin 3(15.79%), 2(10.52%) corticosteroid other classes were represented in Table no. 9.

**Table 9**  
***Distribution of Medication classes involved in drug duplication***

Medication class	Frequency	Percentage
Fluroquinoline	1	5.26%
Cephalosporin	3	15.79%
Analgesics & Antipyretics	8	42.13%
Vitamin D	1	5.26%
Nitroimidazole	1	5.26%
Expectorent	1	5.26%
Calcium Chanel blocker	1	5.26%
Antiplatelet	1	5.26%
Corticosteroid	2	10.52%

Drug duplication occurs when two doctors prescribed for the same patient and in market many combinations of drugs are available, so during prescribing such drugs, medical practitioners are unaware of its combination of drugs. In our study Tab Dolo 650 and Tab movon was prescribed in the patient but both the drugs contain paracetamol.

## CONCLUSION

From our study, we conclude that most of the medication errors were found in pediatric patients. Thus, necessary care should be taken to adjust the dose according to the age, weight of the patient. In order to reduce drug

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duplication, polypharmacy, patient medication history, and on-going therapy should be consider while prescribing drug.

## FUTURE SCOPE

We wish to continue the present research further and design another study in which these medication errors can be used as patient safety indicators which can avoid the occurrence of adverse drug reactions thereby contributing to the present knowledge of adverse drug reaction monitoring.

## CONFLICT OF INTEREST

Conflict of interest declared none.