**International Research Journal of Pharmaceutical and Applied Sciences (IRJPAS)**
Available online at **www.irjpas.com**
Int. Res J Pharm. App Sci., 2013; 3(1): 28-30

**Review Article**

# PRESCRIBING ERRORS IN PAEDIATRICS: A REVIEW

**Dr. Tarsem Singh, Dr.Harmanjit Singh, Dr. Navreet Natt**
[1]MD Paediatrics, Assistant Professor, Department of Paediatrics, Sri Guru Ram Das Institute of Medical Sciences and Research, Vallah, Amritsar. [2]Senior Resident, Department of Pharmacology, PGIMER, Chandigarh, [3]MD Pharmacology, medical officer, CHC Manawala, Amritsar.

(Received: 08 February, 2013; Accepted: 15 February, 2013; Published: 25 February, 2013)

***Corresponding Author's email:*** drtarsemnahal@yahoo.com

**Abstract**: Prescribing errors are a major cause of iatrogenic injury in patients. Paediatric age group is more vulnerable to adverse drug events due to prescribing errors. Less information is available regarding prescribing errors and adverse effects in this age group. Most of these errors and the morbidity and mortality associated with them are preventable. The article aims to bring to light issues pertaining to epidemiology and type of common prescription errors in pediatric prescriptions and the steps to be taken to prevent these errors.

**Key words:** Prescribing errors, adverse drug events, pediatrics

## PRESCRIBING ERRORS IN PAEDIATRICS

Prescribing errors are one of the most common and preventable causes of iatrogenic morbidity and mortality[1]. A clinically meaningful prescribing error occurs when, as a result of a prescribing decision or prescription writing process, there is an unintentional significant reduction in the probability of treatment being timely and effective or increase in the risk of harm when compared with generally accepted practice[2]. Most of the studies are centered on adult prescription errors. Information regarding the epidemiology and prevention of medication errors in pediatric patients is limited. The task of prescribing, dispensing, administering, and monitoring medications is more challenging in pediatric practice making this age group more prone to errors due to weight based calculations[3]. The number of potential adverse drug events in pediatrics is three times that found in adult in-patients[4].

Prescribing errors occur in 6.5 of 100 adult hospital admissions and 5 of 100 adult medication orders[5]. Among paediatric patients, as per study conducted in a tertiary care pediatric in-patient setting in Saudi Arabia, the prescribing error rate was 56 per 100 medication orders with dose errors being most prevalent followed by route errors. Prescribing error rates were highest in prescriptions for electrolytes (17.17%), antibiotics (13.72%) and bronchodilators (12.97%). PICU accounted for approximately one third of the errors (33.9%) [6].

In another study conducted by kaushal et al in 2 academic institutes over 6 weeks, neonatal intensive care unit had a significantly higher rate of adverse drug events as compared to other paediatric wards while prescribing error rates were similar in all pediatric units. The most common drugs involved in medication errors and potential adverse drug events were anti-infective agents and routes were intravenous followed by oral and inhalation[7].

Pediatric patients carry a higher risk for adverse drug reactions due to different and changing pharmacokinetic parameters between patients at various ages and stages, need for calculation of individualized doses based on the patient's age, weight (mg/kg), body surface area (mg/m2), and clinical condition, lack of available dosage forms and concentrations appropriate for administration to neonates, infants, and children, need for precise dose measurement and appropriate drug delivery systems, the frequent use of "off-label" indications in children, lack of published information or FDA-approved labeling regarding dosing, pharmacokinetics, safety, efficacy, and clinical use of drugs in the pediatric population.

**Most common prescribing errors in pediatrics are:**

- Prescribing a drug based on the weight of the patient without writing the final calculated dose in the prescription sheet based on that weight.
- Prescribing a drug to a child without documenting the weight of the child on the prescription sheet.
- Prescribing a drug to a patient without adjusting for renal insufficiency.
- Prescribing a dose regimen (dose/frequency) that is not that recommended for the formulation prescribed.
- Writing illegibly.
- Misspelling a drug name.
- Prescribing a drug to a patient while the patient has a known allergy to that drug
- Continuing a prescription for a longer duration than necessary.
- Unintentionally not prescribing a drug for a clinical condition for which medication is indicated.
- Prescribing a drug that should be given at specific times in relation to meals without

specifying this information on the prescription.

- Prescribing a drug to be given by intermittent intravenous infusion without specifying the duration over which it is to be infused.
- Prescribing a drug with a narrow therapeutic index in a dose predicted to give serum levels above the desired therapeutic range.
- Prescribing a drug to be given by intermittent intravenous infusion in a diluent that is incompatible with the drug prescribed.
- Omission of the prescriber's signature.
- Prescribing a drug without taking into account a potentially significant drug interaction.
- Continuing a drug in the event of a clinically significant adverse drug reaction
- Prescription of a drug in a potentially subtherapeutic dose
- Writing a drug's name using abbreviations or other non- standard nomenclature.
- Prescribing a drug for a patient who has a specific contraindication to its use.
- Prescribing a drug to a patient without adjusting for body size
- Prescribing a dose that is calculated based on an out of date body weight
- Prescribing a drug to a patient without adjusting for age
- Prescribing a drug to be taken when required, without specifying the maximum daily dose of the drug prescribed in the prescription
- Not rewriting a prescription in full if a change has been made to it (e.g. dosage increase or change in frequency

Prevention of prescription errors can decrease the rate of adverse drug events in the high risk paediatric population. Prescriber is the starting point of a prescription who can take steps to prevent the occurrence of prescribing errors:

1. A prescriber should prescribe for pediatric patient only if he is familiar with the drug and paediatric practice. Allergies, drug interactions and cost-effectiveness must be taken into consideration while prescibing.
2. Official (generic) or trademarked name of the drug clearly spelled should be used in prescription. Trade name is preferred for medications that contain multiple ingredients. Abbreviations or locally coined names should not be used as they can be misleading.
3. Dosage strengths or concentrations and volumes should be expressed in exact metric units(e.g., mg, units), rather than dosage form units (e.g. tablets, vials, ampules, capsules, mL) as different medications are available in varying strengths or concentrations.
4. The prescription for paediatric patient should have both the calculated dose and the mg/kg or mg/m2 dose. This prevents misreading by pharmacist/ nurse and facilitates double check while dispensing and administering drug.
5. Correct weight of patient must be written on prescription.
6. While prescribing a drug to be to be taken when required maximum dose of the drug should be written in prescription.
7. A leading zero should always precede decimal expressions less than one (i.e., 0.8 mg), and a trailing zero should never follow a whole number (i.e., 8.0 mg).
8. New prescriptions should be written if the dose of drug is changed and remaining refills of previous doses should be canceled.
9. When appropriate, prescriptions should be written for commercially available drug formulations, rather than dosage forms prepared by manipulation of commercially available products. Wherever possible, oral route should be prefered over parenteral.
10. Consolidating styles of managing patients should be considered e.g consolidating styles in an intensive care unit setting so that all drips are written as either mcg/kg/minute or mg/kg/hour can avoid calculation errors that occur while moving back and forth between systems.
11. Odd dosages should be rounded-off for more convenient and accurate measurement, without compromising patient care.
12. Prescription should be legible and complete.
13. Computerized prescription writing should be encouraged. The electronic prescription system implemented by government health care facilities in Dubai has helped reduce medication errors by 50%[8].

About 70% of hospital admissions related to adverse drug events are associated with patient compliance[9]. Counseling the patient and his or her caregiver, familiarizing them with the name, indication, route of administration, dose, dose frequency, potential adverse effects and their management can reduce adverse drug events due to various medication errors.

**REFERENCES**


1. Kozer E, Berkovitch M, Koten G. Medication errors in children. *Pediatr Clin N Am,* **2006; 53:** 1155-1168.
2. Ghaleb MA, Barber N, Dean Franklin B, Wong ICK. What constitutes a prescribing error in paediatrics? *Qual Saf Health Care*, **2005**; 14: 352–357.
3. Folli HL, Poole RL, Benitz WE, Russo JC. Medication error prevention by clinical pharmacists in two children's hospitals. *Pediatrics,* **1987**; 79: 718-722.
4. Cohen MR, Blanchard N, Frederico F, Magelli M, Lomax C, Greiner G. Draft guidelines for preventing medication errors in pediatrics, *J Pediatr Pharm Prac,* **1998**; 189-202.
5. Bates DW, Cullen DJ, Laird N, Peterson LA, Small SD, Servi D, Laffel G, Sweitzer BJ, Shea BF, Hallisey R, Vliet MV, Nemeskal R, Leape LL: Incidence of adverse events and potential adverse events. Implications for

prevention. ADE prevention study group**.** *JAMA,* **1995**; 274-34.

6. Al-Jeraisy M**,** Alanazi MQ **and** Abolfotouh MA. Medication prescribing errors in a pediatric inpatient tertiary care setting in Saudi Arabia, *BMC Research Notes,* **2011**; **4**: 294.
7. Kaushal R, Bates DW, Landrigan C, McKenna KJ, Clapp MD, Federico F, Goldmann DA, *JAMA,* **2001**; 285(16): 2114-20.
8. MENAFN.Com: Dubai's e-prescriptions reduce medication errors by 50%. [http://www.menafn.com/qn_news_story_s.asp?StoryId=1093239285/]
9. Senst B, Achusim LE, Genest RP, Cosention LA, Ford CC, Little JA. Practical approach to determining costs and frequency of adverse drug events in a healthcare network, *Am J Health Syst Pharm*, **2001**; 58: 1126-32.