

Medication Safety in Pediatrics

Certina Ho

RPh, BScPhm, MIST, MEd

Atsushi Kawano

BSc, MSc, BScPhm Candidate

Calvin Poon

BScPhm Candidate

Overview

Incidents reported to the ISMP Canada Community Pharmacy Incident Reporting Program (CPhIR) were used to conduct an aggregate analysis of medication incidents associated with the pediatric population. Using a search criterion of “0-28 days inclusive” or “>28 days to 18 years inclusive” for the type of medication incident, we retrieved 454 reports from the CPhIR database.

It is easy to lose sight that pediatric patients are quite different from adults. After birth, a new born undergoes rapid changes in weight and physiological function.^{1, 2} As the neonate matures into an adult, the required drug dose changes as pharmacokinetic properties fluctuate.^{1, 2} From a medication safety perspective, pediatric patients are susceptible to many potential medication errors throughout the medication-use process (i.e. prescribing, order entry, dispensing, administration, and monitoring).³ During prescribing and order entry, the rapidly changing physiological features of pediatric patients make weight-based dosing an important consideration.³ In the dispensing stage, pediatric patients may require medications to be diluted because medications are typically manufactured for adults.³ After taking the medication, pediatric patients may have difficulty communicating their therapeutic concerns.³ This can lead to overlooking potentially serious adverse reactions and medication errors. Community pharmacists can encourage safe use of medications in the pediatric population by proactively addressing vulnerable areas of practice.

ISMP Canada
Institute for Safe Medication Practices Canada
www.ismp-canada.org

CPhIR
Community Pharmacy Incident Reporting Program
www.cphir.ca

CMIRPS
Canadian Medication Incident Reporting and Prevention System
<http://www.ismp-canada.org/cmirms/index.htm>

Aggregate Analysis

Multiple themes were identified through an aggregate analysis of the 454 reports retrieved from the CPhIR database

PRESCRIBING & ORDER ENTRY

Theme 1: Weight-based dosing

Weight-based dosing is a unique challenge with pediatrics. The primary contributing factor to this type of error is the lack of confirmation of the appropriate dose according to a reference. It is imperative that the weight of a child should always be asked and the dosage is appropriate for the corresponding weight.

Sample case: “Epipen® Junior was prescribed for a child. When checking the child’s age, it was unlikely that the child was less than 30 kg (i.e. the upper limit for the Junior formulation). The weight of the patient was confirmed with the parent to be over 30 kg and the adult formulation was prescribed instead.”

Sample case: “An 11.4 kg two-year-old child was prescribed Flovent® HFA 250 mcg BID. The pharmacist believed the highest recommended dose for the child is 350 mcg/day and verified this dose with two sources (Lexi-Comp and e-Therapeutics +). The prescriber was contacted about the possibility of an overdose, thereby decreasing it to 100 mcg BID.”

Sample case: “A child was prescribed amoxicillin oral suspension 125 mg TID. When the pharmacist checked the reference dose according to the weight of the child, the dose should [have been] 150 mg TID to 300 TID. The prescriber was notified and changed the original prescription to an appropriate dose.”

Theme 2: General Order Entry Errors

Order entry errors can propagate medication incidents by facilitating many types of errors. These include (but not limited to) unit errors, transcription errors, therapeutic substitution, and/or inaccurate transfer of information from a previous prescription.

Theme 3: Incorrect Patient

Pediatric prescriptions are often dropped off by a parent, who may also be filling additional prescriptions for other family members. This means a pharmacy potentially receives multiple prescriptions with the same surname. If appropriate steps are not taken to distinguish patients with similar names, pharmacy staff is more likely to select an incorrect patient from the patient database during the order entry stage of the medication-use process.

Sample case: “A mother brought in 3 prescriptions for herself and one for her daughter. All four prescriptions were accidentally processed under the mother’s name.”

DISPENSING, ADMINISTRATION, & MONITORING

Theme 4: Allergy

Pediatric patients being medicated for the first time are at risk for allergic reactions. A detailed record of medication use becomes an important tool to avoid serious allergic reactions. Also, pharmacists are encouraged to ask parents about any food allergies that the patient may have because certain pediatric medications contain food components commonly associated with allergic reactions (for example, Flovent® Diskus® should not be given to patients with IgE mediated allergic reactions to lactose or milk because it contains lactose, including milk protein, which acts as the “carrier”).⁴ If a pharmacist becomes aware of an allergy, every effort should be made to update the patient profile (such as discontinuing remaining balances of the medication inducing the allergic reaction).

Sample case: “A child was allergic to bananas. The child was prescribed amoxicillin and the pharmacy staff missed the food allergy and dispensed the banana-flavoured amoxicillin oral solution. No harm was done as the error was caught before administration.”

Sample case: “A child was prescribed ranitidine but the mother noticed a bad reaction and informed the pharmacy. Ranitidine was discontinued but there was still a balance owing on file and no pharmacy staff noticed it. The remaining balance of ranitidine was delivered to the mother, at which time the mother sent back the drug.”

Theme 5: Reconstitution

Pediatric patients often require oral suspensions that are prepared by reconstituting stock powders. This process puts pediatric patients at risk for reconstitution-specific errors. Certain medications require specific reconstitution procedures. For example, Suprax® (cefixime) 100mg/5mL oral solution requires reconstitution with 33 mL of sterile water in two portions.⁵ These specific instructions may sometimes be difficult to remember because they are medication-specific.

Sample case: “A pharmacy staff member, after mixing Suprax® for another patient realized that he had mixed it incorrectly for an earlier patient. Instead of reconstituting it with 33 mL of [sterile] water in two portions, he added two portions of 33 mL. The parent of the incorrectly prepared Suprax® preparation was contacted and returned the medication to the pharmacy”

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