Accidental Childhood Acetaminophen Overdoses and Our Need to Educate Parents

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**Problem:** Even though almost 27,000 accidental childhood acetaminophen overdoses have been reported annually over the last few years, death is rare, according to the American Academy of Pediatrics. But when a child dies, the family’s anguish is palpable and may touch us close to home, especially if we have children of our own.

The Institute for Safe Medication Practices (ISMP) received a report of a 10-year-old who died as a result of an accidental overdose of acetaminophen (Tylenol®, Ortho-McNeil), one of the world’s top-selling pain relievers. The child had been sick earlier in the week with cold-like and flu-like symptoms. He was given Tylenol® for his symptoms over the next few days. The drug built up in his system and caused irreversible liver, kidney, and brain damage.

While the details of this tragic overdose are unknown, unintentional childhood overdoses can occur in several ways.

The infant’s formula is about three times more potent than the children’s formulation. Parents sometimes confuse the two and may give a child the prescribed volumetric dose using the more concentrated infant’s drops, especially if they are tired after being awake all night with a sick child. If infant drops that have been left over from when their child was younger are used, and if the physician assumes that the children’s formulation will be used, the volumetric dose that the physician prescribes will result in an error.

Parents might also purchase the wrong formulation, or they might have both formulations if children of different ages are living in the household.

The risk of confusion is heightened even more by the way in which the drug concentration is listed. Instead of showing children’s acetaminophen as 32 mg/ml and the infant’s drops as 100 mg/ml, both concentrations are shown in the amounts per typical dose (160 mg per 5 ml and 160 mg per two droppersful). The inability to compare the products easily can lead to dosing errors.

Even if parents use the correct acetaminophen strength, the measurement of the dose may be incorrect, especially if a household teaspoon is used. The measuring cup markers supplied with Children’s Tylenol® Liquid are inexact: the “one teaspoon” mark measures well over 6 ml.

The term “droppersful” is also misleading and can be misinterpreted to mean a “full dropper.” Yet the maximum fill line (1.6 ml) is only one-half to three-quarters of the way up on the dropper, and the white markings for the 0.8-ml and the 1.6-ml fill lines are poorly visible on the whitish, translucent plastic.

Extra doses are another possibility. A parent might not know that another caregiver has already given the child a dose. Children have also been known to sneak an extra swig of the pleasant-tasting liquid.

Children may consume more than one product containing acetaminophen, especially if the outer carton of a combination product has been discarded and the immediate container does not clearly list the active ingredients and strength (as with Infant’s Tylenol® Cold Concentrated Drops).

**Safe Practice Recommendation:** Pharmacists must be alert to the potential for acetaminophen toxicity, which should be included in the differential diagnosis of many childhood illnesses. However, preventing acetaminophen overdoses begins long before a child presents with an illness. When counseling parents and caregivers about acetaminophen, health care practitioners should use the following strategies:

- Parents should be taught about the different acetaminophen formulations and strengths.
- The practitioner should advise parents not to use any leftover infant’s formulation for older children.
- Before leaving the pharmacy, parents should be asked to determine the correct formulation and dose for their child, based on their current age and weight. The parents should demonstrate how to measure the dose using an appropriate measuring device. An oral syringe may be more accurate than the dosing cups provided by the manufacturer.
- Practitioners should emphasize the serious consequences of an overdose and the ways in which it can occur. They should educate the parents on how to recognize a dosing error and when to call a poison control center for advice.
- The symptoms of acetaminophen toxicity (e.g., anorexia, nausea, vomiting, malaise, right upper-quadrant pain, and jaundice) should be mentioned, because many of these symptoms may prompt caregivers to administer additional doses of the drug.
- Parents should be reminded to keep the outer cartons of the products. They should be taught how to read the labels to avoid dosing errors and to avoid accidental administration of multiple products containing acetaminophen.
- As an added safety precaution, pharmacy managers might consider continued on page 450
relocating all infants’ and children’s formulations of acetaminophen to an area that is close to the pharmacy checkout area in plain view of the pharmacist in an effort to capture an important counseling opportunity.

- Parents should be urged to call their health care practitioner whenever they have a question about the correct dose or strength.
- Practitioners should remind parents that older children who medicate themselves are at increased risk for toxicity, as are malnourished children.
- Parents must be cautioned against using multiple acetaminophen-containing products at one time. They may not realize that “multisymptom” and “non-aspirin” products often contain acetaminophen.

The reports described in this column were received through the USP-ISMP Medication Errors Reporting Program (MERP). Errors, close calls, or hazardous conditions may be reported on the ISMP (www.ismp.org) or the USP (www.usp.org) Web site or communicated directly to ISMP by calling 1-800-FAIL SAFE or via e-mail at ismpinfo@ismp.org.