ISMP Medication Error Report Analysis

Preventing Mix-Ups Between Various Formulations of Amphotericin B

Arixtra Is Not a Hemostat

Measurement Mix-Up

Drug Names Too Close for Comfort

New Vaccine Errors Reporting Program

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These medication errors have occurred in health care facilities at least once. They will happen again—perhaps where you work. Through education and alertness of personnel and procedural safeguards, they can be avoided. You should consider publishing accounts of errors in your newsletters and/or presenting them at your inservice training programs.

Your assistance is required to continue this feature. The reports described here were received through the Institute for Safe Medication Practices (ISMP) Medication Errors Reporting Program. Any reports published by ISMP will be anonymous. Comments are also invited; the writers' names will be published if desired. ISMP may be contacted at the address shown below.

Errors, close calls, or hazardous conditions may be reported directly to ISMP through the ISMP Web site (www.ismp.org), by calling 800-FAIL-SAFE, or via e-mail at ismpinfo@ismp.org. ISMP guarantees the confidentiality and security of the information received and respects reporters' wishes as to the level of detail included in publications.

PREVENTING MIX-UPS BETWEEN VARIOUS FORMULATIONS OF AMPHOTERICIN B

Given the recommendations from the Centers for Disease Control and Prevention (CDC) for the treatment of fungal meningitis in patients infected by contaminated injections dispensed from a New England compounding pharmacy (www.cdc.gov/hai/outbreaks/clinicians/guidance_cns.html), we want to remind health care providers of the risk of confusion between different formulations of intravenous (IV) amphotericin B.

The CDC currently recommends treating patients with voriconazole. For patients who present with severe disease and patients started initially on voriconazole monotherapy who do not improve or who experience clinical deterioration, the CDC recommends considering administration of both voriconazole and liposomal amphotericin B (*AmBisome*) at a dose of 7.5 mg/kg IV daily, which is higher than the standard dose. The liposomal preparation of amphotericin B (*AmBisome*) is preferred over other lipid formulations of amphotericin B, because of better central nervous system

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penetration. (Hospitals may want to consult with a pharmacokineticist for dosing of obese patients.) The CDC says that the routine use of intrathecal amphotericin B, either deoxycholate or lipid formulations, should be avoided due to limited data on its use and associated toxicities when given by this route.

The concern with amphotericin B products in the past has been related to the confusion between liposomal and conventional formulations. Conventional amphotericin B deoxycholate doses should not exceed 1.5 mg/kg/day. However, doses of the lipid-based products are higher. A severe adverse event, even death, may follow if a mix-up occurs between the 2 products.

Confusion with nomenclature is the most common cause of mix-ups between these products. “Amphotericin B” is part of the nonproprietary name for all of these products, so clinicians can easily select the wrong form of the drug on a computer screen, especially if they are not familiar with the differences between these products or if they write an order using the generic name. Prescribers should be encouraged to communicate orders using the proprietary names *AmBisome* (amphotericin B liposomal), *Abelcet* (amphotericin B lipid complex), and *Amphotec* (amphotericin B cholesteryl sulfate complex). The order should include the reason for use as well as the patient’s weight in kg, the mg/kg dose, and the final dosage calculation.

Require an independent double-check of the drug and dose before the administration of amphotericin B products. Restrict the preparation of doses to the pharmacy, where a pharmacist can verify the dose before preparation. Detailed, technical drug information should be easily and readily accessible to pharmacists, prescribers, and nurses who may prescribe, dispense, or administer amphotericin B products. Separate the storage of different formulations of amphotericin B within the pharmacy (and in other areas where the drugs may be stored) and/or affix appropriate warnings to the storage bins.

ARIXTRA IS NOT A HEMOSTAT

Twice within the past 3 months, at the same hospital, pharmacy received a call from the operating room with a request for “Aristra.” After much discussion among the pharmacy staff, *Arixtra* (fondaparinux sodium) was dispensed. This was rejected by the surgeon who requested it, saying he needed “the one that stops bleeding.”

The product he was actually looking for was *Arista* AH, a synthetic, absorbable hemostatic agent

(www.ismp.org/sc?id=94). This product cannot be found in *Micromedex* because it is a device not a drug, a fact that the hospital believes may have contributed to confusion among the pharmacy staff. The US Food and Drug Administration (FDA) Center for Devices and Radiological Health (CDRH) approved *Arista* AH as a device after the drug *Arixtra* had been approved by the FDA Center for Biologics Evaluation and Research (CBER). The brand name similarity was not recognized.

This is not the first time that a non-drug brand name has been confused with the name of a medication. The FDA should have a process to ensure that products regulated by the various centers within the agency (CDRH, CBER, Center for Drug Evaluation and Research, Center for Veterinary Medicine, Center for Food Safety and Applied Nutrition) will not be assigned similar names that can lead to confusion.

MEASUREMENT MIX-UP

Midazolam syrup (*Versed*) 2 mg (1 mL) was prescribed for a child for sedation prior to a procedure. The nurse inadvertently measured the dose as 1 teaspoonful instead of 1 mL. Both scales are displayed on oral syringes of 5 mL volumes and greater. After the event, nurses asked pharmacy to provide oral syringes with a mL-only scale, but they are not available from manufacturers in sizes 5 mL and larger.

ISMP has received more than 50 reports of mL-teaspoonful errors, some leading to injuries requiring hospitalization. Oral syringes, dosing cups, and other measuring devices have been involved. There have also been mix-ups between drams and mL and other non-metric measurements such as ounces and tablespoons. We first reported confusion in 2000. In 2009, we called for use of the metric system for devices accompanying over-the-counter (OTC) and prescription oral liquid medications. Last year, the ISMP Board of Trustees reiterated this position in a public statement (www.ismp.org/pressroom/PR2011_0929.pdf). More recently, ISMP has been working with other organizations, including the CDC and the FDA, to make this a reality. We have also been asking manufacturers of oral liquid dosing devices (cups and oral syringes) to make available mL-only devices for use in hospitals. CDC has held a series of meetings through their PROTECT Initiative Medication Errors Workgroup (www.cdc.gov/medicationsafety/protect/protect_initiative.html) to develop recommendations for standardizing how volumetric measures are displayed on OTC liquid medication packaging and labels. We will keep readers updated on any progress.

DRUG NAMES TOO CLOSE FOR COMFORT

Look-alike/sound-alike similarity between clobazam (*Onfi*) and clonazepam (*Klonopin*) has led to several reports expressing concern that patients may inadvertently receive the wrong medication in either a hospital or outpatient setting. The drugs share some similar indications although they have a 10-fold strength difference in available dosage forms.

Clobazam was approved by the FDA in October 2011 for adjunctive treatment of Lennox-Gastaut syndrome and other epileptic syndromes. Lennox-Gastaut syndrome is a rare and severe form of childhood-onset epilepsy characterized by frequent seizures and different seizure types, often accompanied by developmental delay and psychological and behavioral problems. Clobazam is available in 5 mg, 10 mg, and 20 mg tablets.

Clonazepam also is approved for seizure disorders (including Lennox-Gastaut syndrome) and panic disorders and is used off-label for a variety of other conditions. Clonazepam is available in 0.5 mg, 1 mg, and 2 mg tablets and oral disintegrating tablets of similar strengths (0.125 mg, 0.25 mg, 0.5 mg, 1 mg, 2 mg).

The potential for confusion between these medications is unmistakable. In one case, the risk of confusion was discovered when pharmacists were discussing the potential addition of clobazam to the

hospital formulary. In another facility, a pediatric intensive care unit nurse inadvertently asked for clonazepam after receiving an order for clobazam. We will be adding “clobazam and clonazepam” to ISMP’s *List of Confused Drug Names* and adding clobazam to our *List of Look-Alike Drug Names with Recommended Tall Man Letters* in future revisions. Clonazepam is already on the ISMP tall man letter list due to confusion with clonidine, clozapine, and lorazepam. Preliminarily, the tall man configuration of “cloBAZam” may be the best option to differentiate it from clonazepam.

NEW VACCINE ERRORS REPORTING PROGRAM

ISMP has launched its third national patient safety reporting program. The ISMP National Vaccine Errors Reporting Program (ISMP VERP) joins the National Medication Errors Reporting Program (ISMP MERP) and the Consumer Medication Errors Reporting Program (C-MERP). VERP (<http://verp.ismp.org/>) captures the unique causes and consequences of vaccine-related errors. The program was designed with the assistance of the California Department of Public Health. As with all ISMP reporting programs, reporter information is confidential. Reports to VERP will be sent to the FDA. Plans are also under way to interact on vaccine errors with the CDC. ■