

Look-Alike Medications: A Formula for Possible Morbidity and Mortality in the Long-Term Care Facility

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Medication errors remain an important cause of patient morbidity and mortality. Although all medications have the potential to induce unwanted adverse effects, data on the actual incidence and overall severity of preventable adverse drug reactions remains unknown. An Institute of Medicine report (Institute of Medicine. Preventing medication errors: Quality chasm series. Washington DC, National Academies Press. 2007-06-15) estimated that 1.5 million preventable adverse drug events occur annually in the US and that from 44,000 to 98,000 individuals die in hospitals annually from preventable medication errors. The types of medication errors of clinical relevance leading to moderate to severe outcomes are unfortunately numerous. Such errors would include wrong drug, wrong dose / wrong dose interval and represent the more serious form of a medication error. Institutionalized patients and those patients cared for in long-term care facilities appear to be at heightened risk for a medication error. These patients often receive multiple medications and suffer from variable degrees of cognitive impairment which complicates or negates patient-caregiver communication, one of the most important

means to prevent medication errors. Moreover, the increasing financial constraints placed upon treatment facilities encourage the use of generic, rather than name brand medications by their pharmacy provider. While the use of bioequivalent generic medications is completely appropriate and can be very cost-effective, generic drug manufacturers are less often manufacturing their generic medications to look like the name brand drug. Rather, more and more generic medications are plain appearing with no resemblance whatsoever to the name brand product. This difference in drug appearance between the generic and the brand name product as well as differences in drug appearance between different generic drug manufacturers for the same medication represents another, important means by which patients may experience moderate to serious consequences from a medication error. We report such an experience where a patient in a long-term care facility received multi-day, excessive dosing of glipizide rather than her anti-spasticity medication, baclofen. (*J Am Med Dir Assoc* 2007; 8: 541-542)

CASE REPORT

A 48-year-old white female, weighing approximately 36 Kg, with profound mental retardation and spastic quadriplegia following hypoxic ischemic encephalopathy at birth suffers from multiple contractures, seizures, gastroesophageal reflux disease (GERD), reactive airways disease, osteoporosis, and

severe scoliosis and receives her medications and nutrients via a g-tube. Following a routine evaluation by her physician it was determined that her spasticity was worsening. Her oral baclofen dose was increased from 10 mg 3 times daily to 15 mg 3 times daily, ie, 1.5 10-mg baclofen tablets per dose per g-tube. All other medications remained unchanged and no possible or probable drug-drug interactions were identified in her medication profile.

The patient initially tolerated the increase in baclofen dose well. Although this patient had a history of volume-dependent emesis, these episodes had diminished when switched to a continual feeding pump program experiencing, on average, 1 emesis daily. However, on the third day of her increased baclofen dosing, she experienced 4 emeses episodes in the evening, 4 emesis episodes throughout the fourth day, and 2 emesis episodes on the fifth day. Physical assessment on these

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days was unremarkable and it was felt she might be experiencing an exacerbation of her GERD. On the sixth day of her new “baclofen” regimen she experienced a generalized tonic-clonic seizure despite no change in her routine antiseizure medications. On the seventh day while returning from school she was found to be severely diaphoretic, which coincided with a period off her feeding pump. Initial physical exam was remarkable for a diaphoretic, tachycardic female with a blood glucose (BG) of 29 mg/dL determined via a point-of-care BG monitor (split sample later confirmed by a clinical laboratory as 21 mg/dL). Feeding via her g-tube was restarted with a bolus and the resumption of her usual continuous rate; 20 minutes into feeding her BG was 27 mg/dL. One hour after reinitiating feeding, her BG concentration was 53 mg/dL, and rechecked 15 minutes later, was 84 mg/dL. Seven and one half hours after her first episode of profound hypoglycemia she received her routine evening medications; one-half hour later her BG was 29 mg/dL. The on-call physician was notified and a 4-ounce apple juice bolus was pushed via g-tube with a repeat BG 20 minutes later of 40 mg/dL. An IV was inserted and 50 mL dextrose 50% in water (D50%W) was infused followed by a maintenance infusion of dextrose 5% in one-half normal saline (D5%1/2NS). The patient responded well becoming awake and alert. Her BG following the D50%W bolus was 362 mg/dL. Now stabilized, she was transferred to the hospital for more aggressive evaluation of profound hypoglycemia.

With an unknown etiology and the time course of events suggesting a possible drug-related problem, the patient’s medications were reviewed. All medications were physically examined. The baclofen unit-dose packages were inspected and upon identifying the pill, it was found to be glipizide 5-mg tablets, not baclofen, with the patient receiving 7.5 mg glipizide 3 times daily. The patient was discharged back to our facility after 36 hours of hospitalization in her usual state of health without any apparent sequelae.

DISCUSSION

Few new-onset diseases are associated with acute, profound hypoglycemia in a healthy or otherwise clinically stable, non-diabetic patient with the most common cause drug-induced.¹ Our patient was in her usual state of health until the third day of her errant glipizide dosing that was supposed to be baclofen. In our severely cognitively impaired patient, overt symptoms of hypoglycemia were manifest as multiple daily emeses episodes. Emesis as a presenting symptom of profound hypoglycemia would seem unusual as the most common noncognitive manifestations of hypoglycemia would include a mixture of adrenergic and cholinergic actions including tremor, palpitations, pallor, and diaphoresis, respectively.¹ Additional common symptoms include nausea, thirst, and hunger. Clearly, progressive changes in central nervous system (CNS) function, most notably cognitive impairment or depression of level of consciousness, obtundation, or stupor are observed early in cognitively unimpaired individuals.² These early, highly predictable CNS symptoms reflect the brain’s dependence on consistent glucose for normal function as the brain can neither transport nor store glucose.² Such CNS symptoms

are clinically undeterminable in our patient and thus contributed to the delay in our diagnosis. In addition, in a nonverbal, profoundly mentally retarded patient with spastic quadriplegia, the mild to moderate clinical symptomatology associated with hypoglycemia may not be readily apparent.

Our case of profound hypoglycemia associated with reversible morbidity and an expensive, otherwise unnecessary emergent hospitalization was caused by a medication error. This case underscores the importance of continued vigilance in implementing safe medication practices. Medication errors unfortunately continue at an unacceptably high rate. One of the most common causes of serious medication errors involves drugs where the packaging or the drug products themselves look very much alike. This is exactly what happened with our patient, as the generic formulations of baclofen and glipizide tablets were of the same color and are very similar in appearance. Although these tablets have different imprints, routine checking of medication imprint codes is not a part of medication therapy in our facility. Nevertheless, as the use of generically manufactured medications increases coincident with proactive cost-saving measures, and drugs become more similar in appearance and color with no resemblance to the branded drug’s dosage form or color, the possibility of such “look-alike” medication errors increases. Although numerous approaches to avoid or minimize these types of medication errors have been described,^{3,4} none are fail-safe and none can replace simple, continuous vigilance in the drug administration process.

In our and similar such institutions the patient population is extremely stable as are the medications they receive; 85% of the daily medications used in our facility involve only 10 drugs. Such stability affords a degree of predictability and safety but can also lead to complacency and error. It is our recommendation that whenever the pharmacy provider of the institution changes, the nursing staff should be alerted to the brands of drugs used including associated markings. Moreover, tablet and capsule imprint markings/numbers should be posted at each medication dispensing station and/or computer information system for the drugs used within the facility and whenever changed the nursing staff should be notified and information systems updated. Although bar-coding can markedly reduce the incidence of drug error,⁵ only careful inspection of the drug product can ensure that its content, particularly in locally repackaged dosage forms, is what it is labeled to be.

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