

A One Thousand Unit Mistake

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Case Report

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Abstract

Medication errors are a leading cause of hospitalization and prolonged hospital stays. Insulin is especially infamous as a high risk medication in terms of safety. This case demonstrates that even very large mistakes with insulin can occur easily. Safety protocols must be in place for high risk medications like insulin. Unfortunately not all mistakes are prevented even with these safeguards. In this case there were multiple reasons leading to the medication error. Even when a medication safety committee examines what they see as every possibility for a mistake, human error is underestimated, as was the case with this individual.

Keywords: Metformin; Hypoglycemics; glargine; Anticoagulants; NSAIDs

Introduction

Errors are a part of life and a part of being human. In medicine the goal is to minimize these mistakes to maximize patient safety. The management of medications is one area of medicine that despite the best efforts of the patients and members of the health care team, errors still occur. It has been estimated that unintentional overdoses make up for 40% of emergency room visits. The most common medications involved are insulin, anticoagulants, antibiotics, and NSAIDs [1]. A study by Budnitz et al. [2] on medication errors leading to emergency room visits showed that insulin was the second leading cause with 13.9% and oral hypoglycemics were listed in the top 4 at 10.7% in the elderly. These emergencies were due to patient error. Errors that occur in hospitals happen most frequently with insulin [2] and have been reported as such for years. According to Weiss et al. [3] insulin and hypoglycemic medications account for 7.1 per 10,000 discharges as causes of adverse drug events. Different reasons for this include: a mix up of insulin types,

confusion of generic vs. trade names, and the abbreviation "U" for "units", which is no longer permitted [1]. Many hospitals have protocols in place that require a second nurse to sign off on the dose before administering to a patient to decrease the number of errors. This case demonstrates that even with this type of system in place, large medication errors can still occur.

Case Description

A 59 year old male with a past medical history of uncontrolled type 2 diabetes was admitted to the hospital for severe community acquired pneumonia. The patient was found to have blood glucose (BG) in the 500s mg/dl and was started on an insulin drip to achieve glycemic control.

At home the patient was prescribed insulin glargine 100 units twice daily and insulin lispro 5 units with meals as well as metformin 1000mg twice daily. Patient blood glucose level had improved to 160 mg/dl at about 20:26

and patient had insulin glargine 100units ordered. Patient was to receive this dose and then stop the insulin drip in 2 hours. At 20:49 the nurse called the physician to report that the patient had received 1000 units of insulin glargine instead of 100 units which had been ordered. Physician contacted for orders and the patient was started on dextrose 10% (D10) at 125 cc per hour and hourly glucose checks were started. At 02:35 patient's BG went to 309 mg/dl and patient had D10 stopped and 0.9% normal saline was started at 125cc per hour. At 08:48 the patient's blood sugar had dropped to 82 mg/dl and patient had breakfast and had D10 restarted at 125cc per hour.

Blood sugars were checked hourly for 36 hours and ranged between 82-309 mg/dl but stayed mostly in the 100s. Seventy-two hours after receiving the incorrect dose, the patient's BG trended down after dinner without dosing any short-acting insulin. At discharge, patient was sent home on 20 units of insulin glargine, insulin lispro 5 units with meals, and metformin.

Patient followed up in the office 2 weeks after discharge. His blood sugar numbers were mostly in the 120-150 mg/dl range. The patient reported watching his diet more closely and trying to exercise more as he did not want to be on that much insulin after his overdose in the hospital. He still had concerns about any long term damage from such a large dose of insulin. On exam there was no necrosis or damage at the injection site. Patient was encouraged to continue with lifestyle changes and current medication doses. Patient was then lost to follow-up.

Discussion

When this patient's case was reviewed and assessed, it was determined that there were multiple factors that contributed to this patient's medication error. The hospital had made the decision to change from insulin pens to vials and syringes due to reports from other hospitals that nursing staff did not realize that insulin pens are single-user devices. Pens had been used on multiple patients and the spread of blood borne pathogens was a concern. The transition from pens to vials was made in a week's time, which did not allow the nursing supervisor enough opportunity to have nurses reeducated on every shift and every floor. The medical reconciliation in the computer called for a concentration of 10 units per milliliter, which was misleading and interpreted as 10 units per milliliter when the actual concentration of insulin glargine is 100 units per milliliter. The nurse used a 10mL syringe and drew the

entire vial volume into the syringe and injected it subcutaneously in to the patient's abdomen. An insulin syringe that holds 1 milliliter of insulin holds a maximum of 100 units. The second nurse who agreed with the dose and the second signature realized that the concentration on the medical reconciliation was wrong when dosing another patient a lesser amount of insulin glargine. The nurse read the bottle of insulin glargine and discovered how much insulin the patient had received. It was estimated in 2012 that about one third of individuals with diabetes are on insulin [3,4]. This number is increasing as more patients with type 2 diabetes are diagnosed. There is more insulin resistance with the obesity epidemic and this has increased the need for more patients to require higher doses of insulin. Seeing patients prescribed 100 units of insulin or more is becoming more common. Mistakes of this nature will continue simply because of human nature and the fact that humans will continue to be involved in medicine. This is evidenced by the fact that the same basic errors have continued to occur for years: wrong drug, wrong, dose, wrong route, wrong time, and wrong patient [5]. Learning from these types of mistakes is important to help decrease the likelihood of future mistakes. This patient was lucky that the mistake was realized and that long-acting insulin rather than rapid acting insulin was involved.

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