

Confusion between Epidural Analgesia and Intravenous Antibiotics

Over the last twenty years, there have been 15 reported cases of confusion between epidural analgesia and intravenous (IV) antibiotic administration in labor and delivery (L&D) units. Of those cases, five resulted in a patient death. Several factors contributed to the mix-ups including:

- Similar looking infusion bags
- Missed warning labels
- Point-of-care barcode medication administration (BCMA) system that was not completely implemented or utilized
- Drug shortages

One error occurred between IV penicillin G and epidural fentanyl (2 mcg/mL) with bupivacaine (0.125%). Due to a drug shortage, the pharmacist had to prepare the bupivacaine and fentanyl and used a smaller IV bag volume (50 mL) and a different label (white label and a red warning label instead of the usual bright yellow label). The L&D nurses had not been informed of the change in bag size and label color. A nurse administered the fentanyl/bupivacaine via the IV route instead of the intended penicillin G. The patient experienced seizures and respiratory arrest but was immediately given IV naloxone and a bolus of lipid emulsion as an antidote, followed by an IV lipid emulsion infusion. The mother and baby survived without long-term adverse effects.

Another patient in labor was given 450 mg of IV gentamicin by the epidural route in place of bupivacaine (0.125%). A pharmacy technician had accidentally loaded a bag of IV gentamycin into the automated dispensing cabinet (ADC) bin holding the epidural bupivacaine infusions. Only the first product of a batch loaded into each bin was bar code scanned. Both the bupivacaine and gentamycin were prepared by pharmacy in 100 mL bags of 0.9% sodium chloride with similar labels. An anesthesia practitioner took the gentamicin bag from the ADC by mistake and administered it via the epidural. The patient complained of pain during the labor however there were no other adverse events.

In another example, a patient died after receiving IV fentanyl with bupivacaine instead of penicillin G. The nurse had missed the large pink warning labels "For Epidural Use Only" on the front of the epidural bag, and a small pink label on the back. The L&D unit had implemented a BCMA system however, most L&D patients bypassed the admissions department where barcoded identification bands were issued. The patient did not have an ID band on when the nurse administered the wrong drug, and thus the BCMA system and its safety features were bypassed.

The following strategies may assist in preventing confusion between epidural analgesia and IV antibiotics on L&D units.

- Require that the prescriber and/or anesthesia provider initiate orders and ensure a pharmacist verifies the orders before the infusion is brought to the bedside.
- Consider using local anesthetics for epidural analgesia that may be less cardiotoxic.
- Inform all practitioners about changes in drug preparation and processes and emphasize differences in appearance, labeling, container sizes, concentrations, products, or directions for

References

1. Institute for Safe Medication Practices. (2018). *Nurse Advise-ERR*. Retrieved from Institute for Safe Medication Practices: <http://www.ismp.org/newsletters/nursing/issues/NurseAdviseERR201903.pdf>

administration. Conduct a failure mode and effects analysis (FMEA) before the change to identify potential risks.

- Use a different size/shape container or colored label for epidural analgesics to differentiate it from IV medications.
- Require pharmacy to apply large warning labels that state, “For Epidural Use Only” in a standard color on both sides of the epidural bag. Affix a warning label over the access port used to spike the infusion bag.
- Require pharmacy to dispense epidural analgesia with the yellow-striped epidural tubing to facilitate the right route.
- Scan each epidural bag individually before putting it in the correct storage location in the ADC.
- Develop a checklist of items to assist nurses in preparing patients for epidural analgesia. Include a timeline with steps to perform.
- Ensure the practitioner who will administer the epidural analgesia brings it to the patient’s bedside immediately before use. Avoid handoff between nurses and anesthesia staff. If epidural analgesia and IV infusions need to be taken into a patient’s room together, place them in separate and secure locations.
- Minimize interruptions by establishing a quiet zone in the patient’s room to prepare medications and solutions.
- Ensure the admission process requires all L&D patients have a barcoded ID band upon arrival and before any medications are administered.
- Require complete implementation of the BCMA system and full compliance by all staff.
- Implement a time-out immediately before starting the epidural infusion, which includes reading the drug name and concentration from the label out loud to verify the drug.
- Trace lines from their source (i.e. infusion pump) to the patient’s access site before connecting IV tubing or administering medications or solutions.
- Don’t ignore patients’ concerns or complaints of symptoms. Evaluate medications and solutions and assess for potential medication errors.
- Implement a protocol to identify and treat local anesthetic toxicity. Ensure the protocol and rescue medications (i.e. lipid emulsion) are easily accessible.
- Inform staff of the potential confusion between epidural analgesia and IV antibiotics and teach them to recognize and treat local anesthetic toxicity.
- Transition to unique neuraxial epidural connectors when they become available to prevent misconnections with other types of neuraxial or IV connectors.

References

1. Institute for Safe Medication Practices. (2018). *Nurse Advise-ERR*. Retrieved from Institute for Safe Medication Practices: <http://www.ismp.org/newsletters/nursing/issues/NurseAdviseERR201903.pdf>