

CAUTION WITH COLORS: AVOIDING POTENTIAL ANESTHETIC MEDICATION ERRORS

Jolly L. Ombao, M.D., Jun Lin, M.D., Ph.D.

Department of Anesthesiology, Long Island College Hospital and SUNY Downstate Medical Center, Brooklyn, N.Y.

INTRODUCTION

Medication errors remain among the most frequent adverse events in hospitalized patients. In the field of anesthesiology, a great potential for drug errors exists, as numerous administrations of potent intravenous drugs is involved. Analysis of the Australian Incident Monitoring Study involving 896 medication errors in anesthesia showed 5% resulted in major morbidity while 0.3% resulted in death. For those potent and rapid onset vasoactive medications, immediate recognition of medication errors and resuscitation are critical to prevention of permanent complications.

CASE REPORT

A 32 year-old woman who underwent primary c-section under spinal anesthesia complained of nausea in the recovery room. She was supposed to receive metoclopramide 10 mg intravenously, but instead, was accidentally given 1 ml of 1% phenylephrine. She complained of severe headache. The brachial blood pressure and radial pulse could not be measured momentarily. Her first measurable blood pressure was 160/132 mmHg, to 162/46 and 123/50 mmHg in five minutes. Her pulse decreased to the 50s after the phenylephrine overdose, then returned to baseline 90s in 5 min. After the mistake was realized, the patient was emergently treated with intravenous diluted nitroglycerin for a total dose of 3 mg with resolution of symptoms within three minutes. Subsequently, she maintained hemodynamic stability. She remained in the recovery room for monitoring and was discharged to the floor 8 hours later. The patient and her husband were informed of the medication error.

DISCUSSION

Phenylephrine is a potent, primarily alpha-1 agonist used as a vasopressor. Accidental overdose of phenylephrine will result in vasoconstriction and profound systemic hypertension, tachycardia, and baroreceptor-mediated bradycardia, or AV block



From left to right:

phenylephrine vial (10mg/ml Baxter by Gensia Scicor, Irvine, CA 92618),
metoclopramide vial (10 mg/2ml, Sicor Pharmaceuticals, Inc., Irvine, Ca 92618),
metoclopramide vial (Baxter Healthcare Corp., Deerfield, IL 60015)

depending on the dose. The hypertension may lead to headache, seizures, confusion, and intracranial hemorrhage even in healthy patients. Metoclopramide is commonly used in obstetric anesthesia to prevent and treat peri-operative nausea and vomiting. Its similar label and cap color to phenylephrine may lead to an erroneous ampoule switch with phenylephrine. Regulatory bodies such as the FDA mandate the information contained on medication vial labels; however, the color of labels and packaging of different drug classes remain manufacturer dependent. The existence of look-alike and sound-alike drugs together with human errors can potentially lead to disastrous consequences.

To minimize the occurrence of medication errors, a systemic approach needs to be taken. The anesthesiologist should be vigilant in reading the label of the ampoule or syringe before drawing up or injecting the medication. In a survey of Canadian anesthesiologists, only 47.6% always read the label. Furthermore, color remained the single most important identify-

ing feature of the label or container. Formal organization of workspace and drawers with focus on tidiness, and separation of similar appearing drugs are recommended. The pharmacy department may replace the original phenylephrine with diluted preparations. In this case, inadvertent phenylephrine administration was treated promptly with support of airway, aggressive blood pressure control with vasodilators, avoidance of beta blockers, and monitoring of cardiovascular and neurologic status. Maintaining vigilance during administration of all IV medications and anesthetic agents is crucial in order to minimize the risk of medication errors.

CONCLUSION

Similar colors of drug vial packaging and labels present a constant danger for the anesthesiologist. While it is impossible to avoid human errors contributing to medication errors, always reading the labels may help minimize adverse occurrence. This case highlights the importance of maintaining vigilance during administration of all IV medications and anesthetic agents.

REFERENCES

- Abeyssekera A, Bergman IJ, Kluger MT, Short TG. Drug error in anaesthetic practice: a review of 896 reports from the Australian Incident Monitoring Study database. *Anaesthesia*. 2005 Mar;60(3):220-7.
- Lai, YK: Adverse effect of intraoperative phenylephrine 10%: case report. *Br J Ophthalmol*. 1989, Jun; 73(6): 468-9.
- Jensen, L.S., Merry A.F Evidence-based strategies for preventing drug administration errors during anaesthesia. *Anaesthesia* 2004, 59, 493-504.
- Olson, K. Poisoning and Drug Overdose. Pseudoephedrine, Phenylephrine, and Other Decongestants, NY : McGraw-Hill, 2007.
- Orser, B, et al.. Medication errors in anesthetic practice: a survey of 687 practitioners. *Canadian Journal of Anesthesia* 2001, 48:139-146