

Inadvertent intrathecal injection of labetalol

ABSTRACT

Labetalol is a combined α and β adrenergic receptor blocker. It is used to treat hypertension, especially in pregnant patients. We report a case of a female patient who was given labetalol intrathecally in place of bupivacaine due to a similar appearance of ampoules which resulted in a drop in blood pressure and pulse rate. The patient responded to fluid resuscitation and there occurred no neurological sequelae.

Key words: Inadvertent, intrathecal injection, labetalol

Introduction

The Institute of Medicine's first Quality Chasm report, *To Err Is Human: Building a Safer Health System*, reported that medication-related errors were a significant cause of morbidity and mortality; and accounted "for one out of every 131 outpatient deaths, and one out of 854 inpatient deaths."¹

The wrong drug administration in the intrathecal space can result in catastrophic neurological consequences. Various cases have been reported where inadvertent injection of the wrong drug in the intrathecal space resulted in adverse neurological outcomes of varying degree and a few resulted in severe hemodynamic instability. The present report describes a patient who was given an accidental subarachnoid injection of labetalol.

A 32-year-old female American Society of Anesthesiologists physical status 2 was scheduled for fistulectomy. Lumbar puncture was performed for spinal anesthesia in sitting position at L3-4 interspace. The patient was kept in sitting

position for 5 min after injecting 1.5 ml of the drug for saddle block. The Patient was then turned to the supine position. Her blood pressure dropped to 100/60 from 138 to 84 and pulse became 58 from a baseline value of 74/min. 500 ml of crystalloid was given over 5 min and the hemodynamic status became stable. We observed that there was no sensory and motor blockade even after 20 min. In an attempt to look for the cause, we found unbroken ampoule of bupivacaine over anesthesia trolley, and the drug which was injected intrathecally was labetalol. Having realized the accidental injection of labetalol, monitoring was continued for another 10 min and when patient remained stable, we repeated saddle block with bupivacaine and surgery was performed without any complications. She suffered no apparent adverse neurologic effects. Neurological examination was performed after 1-week and after 1-month and results was found to be normal.

The present case illustrates a medical error whereby a wrong medication was administered in the intrathecal space. The error primarily took place due to two reasons: The anesthesiologist reliance on a junior resident and not

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How to cite this article: Verma S, Bhatia PK, Sharma V, Sethi P. Inadvertent intrathecal injection of labetalol. *Saudi J Anaesth* 2016;10:345-6.

Access this article online	
Website: www.saudija.org	Quick Response Code 
DOI: 10.4103/1658-354X.174899	

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verifying the ampoule oneself, and because of the similar appearance of labetalol and bupivacaine ampoules [Figure 1].

Discussion

Ali *et al.* searched PubMed Register Case reports from 1966 to September 2013^[2] and found a long list of drugs which were given intrathecally inadvertently. The list includes tranexamic acid, atracurium, pancuronium, magnesium sulfate, potassium chloride, bleomycin, tramadol, rifampicin, methotrexate, aminophylline, and neostigmine, etc. Among all, most dreaded complications were observed with tranexamic acid.^[3]

There is only one case report published on the intrathecal administration of labetalol. Balestrieri^[4] reported the first case of inadvertent intrathecal injection of labetalol in a patient undergoing postpartum tubal ligation. After realizing injection of the wrong drug, they immediately removed the catheter from intrathecal space and patient recovered without any sequel.

To avoid the higher spread of a wrong drug after intrathecal injection, head up position, aspiration of cerebrospinal fluid (CSF) followed by intrathecal irrigation with Saline 0.9%, lactated Ringer's solution or Plasmalyte have been used though the volume of irrigation that should be used is not known. Kaiser *et al*^[5] aspirated 50 ml of CSF for management of inadvertent intrathecal injection of 5 mg morphine while O'Marcaigh *et al.* performed a ventriculolumbar perfusion with 240 ml of warmed isotonic saline through ventricular and lumbar catheters to remove a high dose of intrathecally administered methotrexate with favorable outcome.^[6]

Royal College of Anaesthetists (patient safety update



Figure 1: Look-alike ampoules of bupivacaine and labetalol

1st January 2012 to March 2012) have provided guidelines to prevent wrong drug administration.^[7] The label should be read carefully on the drug ampoule and syringe before drawing up the drug. (Labels on ampoules and syringes should be legible). The drug drawers and workspace should be organized and tidy; similar or dangerous drugs should be separated, or removed if possible. Labels may be checked by a second person before a drug is drawn up or administered. Drug errors should be reported and reviewed. A pharmacist should be appointed to the operating theatre, and changes in drug presentation notified ahead of time. Similar packaging and presentation should be avoided where possible. Drugs should be presented in prefilled syringes where possible. Drugs should be drawn up and labeled by the anesthetist who will administer them. Drugs should be color coded by class, according to national or international standards. Coding by syringe position, size or needle on the syringe could be used.

The wrong drug administration, particularly in the subarachnoid space could be associated with complications and can be avoided by following guidelines provided by the Royal College of Anaesthetists.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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