The Pharmacological Safety Profile of Tetracaine

A USP Formulation of Lidocaine 0.4%, Tetracaine 0.2% and Epinephrine 1:250,000

Question: Is Tetracaine more neurotoxic and/or cardiotoxic than bupivacaine?
Answer: NO
Question: Is the first metabolite of Tetracaine, para-aminobenzoic acid (PABA), a major allergen?
Answer: NO

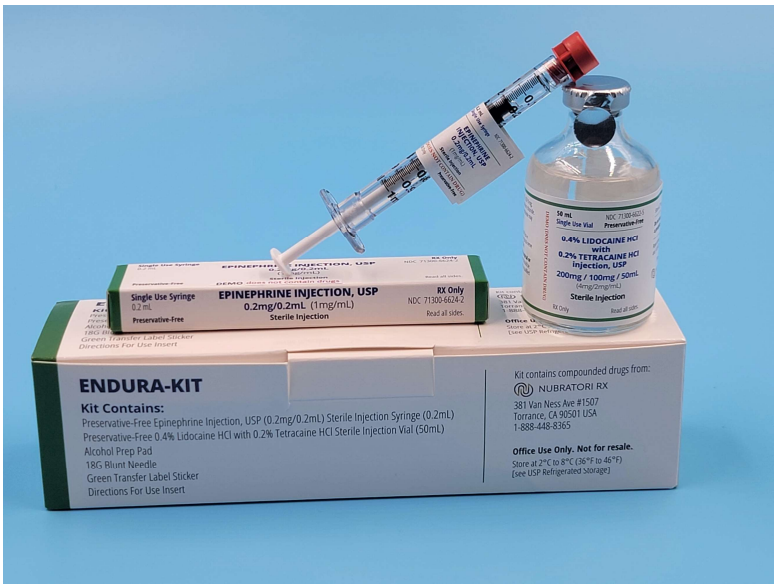
All local anesthetics are neurotoxic in some concentration. For instance, the most popular current local anesthetic, lidocaine, is neurotoxic in concentrations of 5%. This illustrates the basic maxim of toxicology and pharmacology, that "the dose makes the poison". 1% tetracaine is similar in neurotoxicity to 5% lidocaine or 1% bupivacaine. Bupivacaine, however, is the most cardiotoxic amide local anesthetic. Cardiac conduction suppression remains the hallmark of bupivacaine, not tetracaine. Therefore bupivacaine 0.75% was removed from the market by FDA. Tetracaine has been used intrathecally for nearly 90 years worldwide, in a concentration of 0.5%, with no evidence of neurotoxicity on spinal nerve roots. 2% lidocaine is safe as well for intrathecal use. 5% lidocaine has been associated with Transient Neuropathic Syndrome.

Neither tetracaine nor lidocaine has been associated with cardiac toxicity at normal doses, even if unintentionally injected intravenously. Ergo, if 0.5% tetracaine is not toxic intrathecally on naked spinal nerve roots, it is not possible to be toxic to myelinated peripheral nerves in an even lower concentration. As regards PABA, the primary metabolite of tetracaine, this is also not toxic in low doses. Indeed, PABA is a degradation product of several medications as well as a substance which occurs naturally in the living human body. Even a cursory inspection of the relevant literature confirms this.

There are several newer and longer-acting local anesthetic products becoming available but nearly all of them share the same issue: their base component is some concentration of the highly cardiotoxic amide local anesthetic, bupivacaine. They vary with assorted methods used in the delivery system. There are liposomes, acetate gels, etc., but unfortunately, all these preparations share the issues associated with the well-known and potentially lethal cardiac conduction system toxicity of the underlying agent. Despite recent advances in therapy for bupivacaine cardiac toxicity with the use of intralipid therapy, the rescue agent is neither universally effective nor unassociated with inpatient hospitalization. Endura-Kit, a patented and trademarked, novel iteration of the USP components lidocaine, tetracaine, and epinephrine, forming the patented and trademarked drug, Enduracaine, offers very long-acting, very low toxicity local anesthesia, whether by local infiltration or nerve block, with substantially less motor block than its long-lasting sensory block. Further, because of the very slow decrease in analgesic effect, Endura-Kit™ version of Enduracaine™ does not typically show a rebound pain effect as the local anesthetic recedes.

In our research, and among early adopters (over 8,000 uses), we have not found the drug to be implicated in Local Anesthetic Systemic Toxicity (LAST). LAST is thus essentially a phenomenon of the use of bupivacaine The consideration is irrelevant for tetracaine, which hydrolyzes on contact with either RBC or plasma pseudocholinesterases. Thus, the long-acting component of tetracaine exists but moments in the circulation, as it is immediately hydrolyzed by plasma and RBC pseudocholinesterases. With even a large volume (contents of vial), unintentional intravascular injection is not associated with lethal consequences. As well, since there is no liposome involved, the drug diffuses as injected locally, thus allowing surgeons to use their normal and customary local infiltration techniques. When used for nerve block in a relatively avascular tissue plane, such as with adductor canal, fascia iliaca, or interscalene type blocks, duration is extended by the drugs' slow movement into the circulation.

Endura-Kit™ is a cost-effective long-acting local anesthetic. It is provided in a 50ml vial, at an average cost per ml that is 60% less than liposomal bupivacaine. There is no minimum purchase. We are happy to provide sample drug to trial on request. As well, with use of the drug, our national sales and marketing partner, InfuseSystem, provides a real time text application which allows the user to check patient analgesia status, supplemental analgesic usage, etc., online. And the maximal recommended dose is 1.5ml/kg patient weight, allowing adequate volume for any volume-dependent block or infiltration. For additional information or for free trial samples, please visit: www.disg.us or call 1-855-865-3474



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