

Failure of lipid emulsion to reverse neurotoxicity after an ultrasound-guided axillary block with ropivacaine and mepivacaine

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To the editor: Lipid emulsion is being used more and more to reverse local anesthetic-induced toxicity [1–4]. We report a case in which a lipid emulsion was injected into the patient after tracheal intubation but a second convulsion occurred.

A 72-year-old man, American Society of Anesthesiologists (ASA) II status, weighing 60 kg, was scheduled for surgical exploration of a wound in the right forearm. The trauma was consecutive to an episode of syncope caused by hypoglycemia. Medical history revealed insulin-dependent diabetes mellitus and an episode of chest pain. Coronarography, echocardiography, and electrocardiography were normal 6 months previously. The preoperative electrocardiogram showed normal sinus rhythm of 80 beats·min⁻¹. The patient was taking no daily medication other than insulin. Glycemic control before surgery showed a glucose level of 1.5 g·l⁻¹.

An axillary plexus block, accepted by the patient, was performed with a peripheral nerve block stimulator and ultrasonographic guidance.

A mixture made of ropivacaine (7.5 mg·ml⁻¹) 50% and mepivacaine (20 mg·ml⁻¹) 50% was chosen to have a rapid onset and a long-acting effect. A quantity of 30 ml was used, with 15 ml apportioned to the radial nerve, 10 ml to the medial nerve, and 5 ml to the musculocutaneous nerve. No difficulties were encountered during the anesthetic procedure.

While the surgical procedure was in progress, 20 min after the injection, some neurological and cardiac signs appeared. The first sign was numbness of the mouth and the tongue; this was immediately followed by clonic movements of the left arm, ending in a generalized tonic clonic seizure. Heart rate increased from 80 beats·min⁻¹ to 130 beats·min⁻¹ and peripheral blood pressure increased from 110/75 mmHg to 150/85 mmHg. Propofol (150 mg) and midazolam (5 mg) were immediately administered to facilitate tracheal intubation and assisted mechanical ventilation. General anesthesia was maintained with a continuous infusion of propofol (4 mg·kg⁻¹·h⁻¹). The lipid emulsion Intralipid (Baxter Healthcare, Deerfield, IL, USA) 20% (250 ml) was rapidly infused 15 min after the intubation, which was 35 min after the injection of the local anesthetic mixture. Ten minutes after the infusion of Intra-

lipid a second generalized convulsion appeared and this was terminated by 125 mg of thiopental. Blood samples were taken 1 h after the anesthetic procedure to assess the venous plasma concentration of ropivacaine and mepivacaine.

Because of the patient's history of syncope, brain computed tomography (CT) was performed after the surgery. It was normal. The concentrations of local anesthetics were high, at 1.45 µg·ml⁻¹ for ropivacaine and 4.80 µg·ml⁻¹ for mepivacaine.

Postoperative electrocardiogram showed no signs of arrhythmia or changes in the PQ or QT intervals or QRS width. After 3 h the tracheal tube was removed. The brachial plexus showed no impairment of sensory function. The patient woke up without any sequelae.

Intralipid (Baxter Healthcare) has been reported as being able to reverse neurologic and cardiac complications due to the administration of local anesthetics [5]. We report here a second convulsion after the administration of Intralipid in a patient anesthetized with propofol and mechanically ventilated (to control acidosis).

Several hypotheses can be suggested to explain this finding: first, the dose of Intralipid (4.16 ml·kg⁻¹; 250 ml) was insufficient; second, Intralipid was not efficient enough to decrease the blood concentration of the local anesthetics; and third, the administration of the lipid emulsion was too late (15 min after the beginning of the seizure). Moore [6] advises injecting lipid emulsion after classical resuscitation failure. We think it must be administered as soon as possible after intubation concomitantly with other drugs.

Furthermore, with ultrasonographic guidance, direct intravascular injection could probably have been avoided. However, the resorption of local anesthetic into cellular tissues 20 min after the injection cannot be excluded. Ultrasonographic guidance associated with electric stimulation may make the technique of peripheral nerve block more secure, but it is not an absolute guarantee of safety.

References

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