

Prolonged and Recurrent Seizures in an Infant after Lidocaine Administration for Circumcision: A Case Report

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ABSTRACT

A 3-month-old male infant was referred to our center due to repeated tonic-clonic generalized seizures approximately 20 minutes after the administration of 2cc lidocaine (mg) during circumcision. The seizures still persisted after administration of a single dose of diazepam, phenobarbital, and midazolam. The patient was cyanotic and had gasping breathing on presentation with tonic movements and eye deviation. He was sent to intensive care unit where phenobarbital, and midazolam infusions were administered. On the 1st day of ICU admission and phenytoin second day, he experienced high degree fever and his seizures started again. Increased dose of midazolam infusion and gavage of topomax were started. Due to the recurrence and persistence of seizures, thiopental infusion was started. The seizures were controlled; however, they recurred after the tapering of the infusion. On the 3rd day of hospitalization, he experienced a cardiac arrest and unfortunately, expired on the 5th day of ICU admission.

INTRODUCTION

Lidocaine (xylocaine) is one of the amide-type local anesthetics usually administered both within and outside healthcare facilities with very low rate of toxic reactions. In many cases, the poisoning caused by this medication is due to inadvertent injection of its therapeutic dose into the blood stream, repeated uses of its therapeutic dose, or administration of a toxic dose [1]. Lidocaine is generally used in dorsal penile nerve block (DPNB) during circumcision. Cases of neonatal seizures during circumcision after lidocaine administration following recommended or toxic doses have been reported [2-4]. Prolonged and recurrent seizures after lidocaine administration for this procedure have not been reported to the best of our knowledge

CASE PRESENTATION

A previously healthy, 5010-gram, 3-month-old male infant was referred from a day clinic to our center due to repeated tonic-clonic generalized seizures approximately 20 minutes after the administration of 2cc lidocaine 2% (40mg) during circumcision. A single dose of diazepam, phenobarbital, and midazolam had previously been administered; however, the seizures still persisted. On arrival to the emergency room, the patient was cyanotic and had gasping breathing. Tonic movements and eye deviation were persistent in spite of all previously performed treatments. The patient was intubated and referred to intensive care unit (ICU) for assisted ventilation. Phenytoin, Phenobarbital, and midazolam infusion were administered. After that, the patient became seizure-free. On the second day, he experienced high-degree fever and his seizures started again. Dose of midazolam infusion was increased which was not effective, and therefore, gavage of topomax ® was started. The patient underwent treatment with antibiotics with the diagnosis of aspiration pneumonia and because of the recurrence and persistence of seizures, midazolam was discontinued and thiopental infusion was started. The seizures were controlled; however they recurred after the tapering

the infusion. In CT scan performed, no evidence of hypoxic ischemic encephalopathy was evident. On the 3rd day of hospitalization, the patient's blood pressure dropped; thus, dopamine was started. He experienced a cardiac arrest and unfortunately, expired on the 5th day of ICU admission

DISCUSSION

Lidocaine has a rapid onset and is effective for about 30 to 60 minutes in its plain form and up to about 90 minutes in combination with a vasoconstrictor. Therefore, most of the signs and symptoms of poisoning with lidocaine start about 10 to 25 minutes after its administration [2]. Almost all types of local anesthetics including lidocaine are directly toxic to nerve cells. The first symptoms and signs of local anesthetic toxicity are usually neurological with numbness of the mouth and tongue. Shortly afterwards, there is the onset of tinnitus, lightheadedness, numbness, disorientation, confusion, auditory and visual disturbances lethargy, and potentially, coma, apnea, and cardiovascular collapse [1]. Cardiovascular toxicity usually reveals with tachycardia and hypertension; but, with increasing toxicity, bradycardia and hypotension occur. Ventricular arrhythmias and cardiac arrest may also occur. Local anesthetic toxicity is extremely rare in neonates, infants, and children. However lidocaine induced neonatal seizures have been previously reported in 2 cases after lidocaine administration for circumcision. One of them was a 25-day old former premature newborn that exhibited two episodes of generalized tonic-clonic seizures while lidocaine dose administered to him was within the recommended range [3]. The second one was a 7-week-old newborn that developed generalized seizures shortly after the administration of a toxic dose of lidocaine [2]. In addition, there is only one case report of lidocaine-induced seizures in the literature where a 3-month-old male infant received an overdose and developed generalized tonic-clonic seizures [4].

Recurrent seizures have been previously reported in a neonate where intravenous lidocaine was given in conjunction with midazolam and atropine for preoperative intubation [5].

Therefore, it seems that, prolonged and recurrent seizures after lidocaine administration for DPNB have not been previously explained. It has been reported that seizures happen when the dose of lidocaine administered exceeds 3mg/kg [1, 2]. However, some cases of seizure following administration of recommended doses of lidocaine have also been reported [3].

Most of these seizures are self resolving or resolve with conventional anticonvulsants.

However, they may be dangerous because of the acidosis and hypoxia due to prolonged duration and resulted hypoxic-ischemic encephalopathy.

It has been stated that in case of hypoxic-ischemic encephalopathy, the answer to the anticonvulsant therapy is not desirable [6]. As it is obvious, the administered dose of lidocaine in our case has exceeded the maximum dose (40mg has been administered while only 15 mg has been allowed). This happens to be the most important cause of prolonged and repeated seizures in our case in spite of all previously performed treatments. In addition, the hypoxemia induced by prolonged and recurrent seizures had resulted in undesirable answer to the anticonvulsant therapy performed in our case. It can be concluded that precise weighting of the infant before administration of lidocaine and attention to its maximum safe dose, is completely necessary in medical managements requiring lidocaine administration

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