



CASE REPORT

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Status Epilepticus Associated with Lidocaine Anesthesia Applied Locally During Circumcision: A Brief Case Report

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ABSTRACT

Local anesthetics are generally preferred to provide anesthesia during circumcision. In this article, a case with no history of epilepsy, progressing to intubation after local lidocaine application during circumcision, and developing unconsciousness and status epilepticus will be presented.

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Introduction

Local anesthetics are generally preferred to provide anesthesia during circumcision. In addition to being typically used in regional anesthesia, local anesthetics have also been used for general anesthesia support, analgesia, some cardiac arrhythmias and seizures. It is known that lidocaine can lower the seizure threshold in a dose-related manner during its systemic use. Overall, the incidence of lidocaine-related seizures was reported to be 5.7 / 1000 patients. However, it is very rare that it lowers the seizure threshold or causes seizures during local anesthesia (1-7). In this article, a case with no history of epilepsy, progressing to intubation after local lidocaine application during circumcision, and developing unconsciousness and status epilepticus will be presented.

Case Report

A circumcision was planned for a three-month-old infant under local anesthesia. After the local anesthesia with lidocaine for the circumcision procedure, the patient developed convulsion. He did not respond to midazolam and rectal diazepam treatment after convulsion. Phenytoin was administered in a loading dose for seizure control. But it did not work. Therefore, midazolam infusion was started and the patient was intubated. He referred to our Pediatric Intensive Care Unit (PICU). In the physical examination, the patient was conscious in stupor, and other system examinations were normal. Hemoglobin was evaluated as 8.7 mg / dl in the examinations, AST, ALT, Urea, BUN, electrolytes, TSH and Vitamin B12 were within normal limits. Transcranial Ultrasonography and Brain Computed Tomography were found to be normal. Phenobarbital treatment was initiated

in the patient and was extubated when the seizure did not recur. The patient who did not have any problems in the follow-up was discharged on the 3rd day. No pathology was detected in EEG and Brain Magnetic Resonance Imaging either. He was planned to be followed up in the Pediatric Neurology Clinic.

Discussion

Lidocaine is an amide-structured local anesthetic that starts rapidly and lasts for medium lengths. Although lidocaine is a safe agent, side effects related to overdose are frequently reported. The systemic effects of amide group local anesthetics last longer than those in ester form due to their slower breakdown by microsome enzymes in the liver. Side effects include vertigo, numbness in the tongue and around the mouth, ataxia, convulsions, agitation and respiratory depression. Some of the side effects due to the effect of the central nervous system are observed (8-11).

In systemic toxicity of local anesthetics; Various factors such as the dose of the drug, the rate of administration, the presence or absence of concomitant disease, and age also play a role. Systemic toxicity may occur in alpha-1-acid glycoprotein and albumin deficiencies even at lower blood concentrations of the local anesthetic (9-10). In the preoperative evaluation and postoperative examinations of our case, no pathology was found. Blood protein values were also within normal limits. The dose of local anesthetic administered was within the recommended dose limits. Çelik et al observed convulsion in a 5-year-old patient immediately after the application of local lidocaine for tooth extraction and reported that they performed resuscitation afterwards (13). Ayaz et al observed convulsion

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in a 12-year-old patient after general anesthesia with low dose intravenous lidocaine (14). In our case, status epilepticus was observed during local anesthesia with lidocaine for circumcision. The patient was intubated and followed up and treated in the PICU.

Conclusion

It should be kept in mind by the physicians related to these issues that lidocaine, which is frequently used in local anesthesia, can cause seizures, loss of consciousness and prolonged convulsions with local applications. The information shared in the literature for precautions and effective treatment approaches is important for the intervention of this toxicity, which is mostly unpredictable. Since infants are prone to prilocaine-induced methemoglobin formation, the use of bupivacaine, a safer local anesthetic, may be recommended in the first three months.

References

- [1] Engin MMN. Which Local Anesthesia Application Should We Use During Circumcision? *J Clin Res Anesthesiol* 2020; 3:1-2.
- [2] Palmer LS, Palmer JS. Management of abnormalities of the external genitalia in boys: In: Wein AJ, Kavoussi LR, Partin AW, Peters CA, et al. *Campbell's Urology*. 11th ed. Philadelphia: WB Saunders 2016; :3368-98.
- [3] Turgut H, Özdemir A. Evaluation Of Analgesia Efficiency of Additional Local Anesthesia During The Circumcision Procedure. *The New Journal of Urology* 2019; 14:114-118.
- [4] Du G, Chen X, Todorovic MS, Shu S, Kapur J, Bayliss DA. TASK Channel Deletion Reduces Sensitivity to Local Anesthetic-induced Seizures. *Anesthesiology* 2011; 115:1003-11.
- [5] DeToledo JC. Lidocaine and seizures. *Ther Drug Monit* 2000; 22:320-2.
- [6] Engin MMN, Arıbaş ÖZ, Şengün Y, Timur F, Kocabay K. Using methylene blue and intravenous ascorbic acid quick therapy in prilocaine dependent toxic methaemoglobinemia after circumcision: A case report. *KSU Med J* 2017; 12:9-11.
- [7] Gunter JB. Benefit and risks of local anesthetics in infants and children. *Paediatr Drugs* 2002; 4:649-72.
- [8] Bigger JT, Hoffman DF. Antiarrhythmic drugs. In: Gillman AG, Rall TW, Nies AS. *Goodman&Gillman: The pharmacological basis of therapeutics* 8th ed. Newyork: Pergamon Pres.1990; :857-61.
- [9] Morgan GE, Mikhail MS, Murray MJ. *LANGE Clinical Anesthesiology*, 4th Edition By; 2004; :264-274.
- [10] Benjamin G, Wildsmith CAW, Wildsmith JAW. Clinical pharmacology of local anesthetic agents. In: Cousins MJ, Bridenbaugh PO (eds). *Neural blockage in clinical anesthesia and management of pain*. 3th. edition. Philadelphia: Lippincott RavenPress; 1998; 97-128.
- [11] Miller RD. *Local anesthetics*. Anesthesia. Fourth edition. Churchill Livingstone 1994; 510-6
- [12] Berde CB, Strichartz GR. *Local anesthetics*. In: Miller RD (ed). *Anesthesia*. 5th. edition. Philadelphia: Churchill Livingstone Inc; 2000; 491-521.
- [13] Çelik M, Soyer ÖU, Şekerel BE. Lidokaine Bağlı Allerji veya Toksikite? *Astım Allerji İmmünoloji* 2008; 6:22-4.
- [14] Ayas M, Işık M. Does Low Dose Lidocaine Cause Convulsions? *Turk J Anaesthesiol Reanim*. 2014; 42:106-108.