



## Case Report

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# Two Cases of Seizures Due to Lignocaine Toxicity Following Elective Circumcision

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## Abstract

Lignocaine is the most preferred local anesthetic worldwide; however, it is not without its side effects. Local anesthetic systemic toxicity is commonly reported as seizures, respiratory arrest, or adverse cardiac events like arrhythmias. We report 2 cases of lignocaine toxicity presenting as generalized seizures and respiratory failure. Both required mechanical ventilation for variable duration, and both were eventually discharged, however, in stark contrasting state where one of them was completely normal and the other severely neuro-debilitated.

**Keywords:** Lignocaine; Seizures; Circumcision**Abbreviations:** LAST: Local Anaesthetic Systemic Toxicity; CNS: Central Nervous System; CSF: Cerebrospinal Fluid; MRI: Magnetic Resonance Imaging

## Introduction

The incidence of local anaesthetic systemic toxicity (LAST) is estimated to be about 0.03% [1]. Lignocaine belongs to the amide group of local anesthetics and is widely used. It has a narrow therapeutic index. Lignocaine toxicity is dose-related and proportional to its plasma levels [2]. Toxic levels of lignocaine can cause central nervous system (CNS) and Cardiovascular problems [3]. CNS toxicity is due to unopposed excitatory nerve activity resulting from blockage of inhibitory cortical synapses and increase of glutamate. Onset of toxic symptoms usually begins within 10-20 minutes after injection [4]. Lignocaine has a concentration-dependent effect on seizures. Herein we report two cases of probable lignocaine induced seizures in children.

## Case 1 Report

Two months old previously well male child underwent elective circumcision. He was presented to the emergency department within one hour of circumcision in cardiac arrest after prolonged seizure. He was revived, intubated and initiated on invasive ventilation for 3 weeks. The complete blood picture was normal. Cerebrospinal fluid (CSF) analysis was normal. The Fundus examination was normal. Non-accidental injury was excluded after careful clinical review and investigations. Magnetic resonance imaging (MRI) of the brain was suggestive of diffuse hypoxic injury. He developed ischemic acute kidney injury and altered hepatic functions. He required prolonged ventilation, had multiple failed

extubation eventually requiring tracheostomy. He was discharged after 45 days on multiple anticonvulsants, tracheostomy tube and nasogastric tube feeds.

## Case 2 Report

Six weeks old male baby underwent elective circumcision at a nearby hospital and he developed seizures within 30 minutes of procedure whilst he was in the recovery room. Seizures were aborted with midazolam, and he was transferred to our institution. He had recurrence of seizures enroute and presented in gasping to the emergency room where he was intubated. All routine investigations including MRI brain was normal. He was ventilated for 5 days and was discharged home with no comorbidities.

## Discussion

Both the cases are presented within 1 month duration. Etiology of seizures was evaluated in detail for the first case. This included glucose, blood gas, lactate, ammonia, plasma amino acid profile and urine organic acids for metabolic workup, CSF analysis for neuro infection, electroencephalogram, MRI brain, fundus and skeletal survey for nonaccidental injury. MRI brain was suggestive of severe hypoxic ischemic encephalopathy. The presentation of second case with similar history of onset of seizures within one hour of circumcision initiated us to evaluate the relationship between the two. After reviewing the literature, the probable cause of seizures was attributed to lignocaine. Lignocaine as a local anaesthetic for circumcision was used in both these cases, however the dose could not be obtained from the medical records. The recommended maximum dose of lignocaine in children is 3mg/kg [4]. We were unable to estimate the serum concentration of lignocaine in our patients. Seizures have been reported even with recommended dosage. The threshold of toxicity may differ with factors such as medication, hypercarbia, electrolyte abnormalities, carnitine or albumin deficiencies, extremes of age [4].

Similar to present cases, Ayas.et.al (2014) reported a case of seizure with lignocaine within safe dose range in a child [3]. Moran et.al reported a case of seizure in neonate following lignocaine administration for elective circumcision [5].

The mainstay of management in LAST is supportive treatment to prevent hypoxia, acidosis and hyperkalemia which may enhance toxicity. Benzodiazepine, barbiturates, hyperventilation, lipid emulsions are commonly used treat lignocaine induced systemic toxicity [2].

## Conclusion

LAST is often overlooked and disregarded. It can cause life threatening adverse events. Clinicians who use local anaesthetics should be acquainted with the mechanism of action, risk factors, dosage, side effects and management of LAST. All precautions need to be exercised during the usage of local anesthesia, especially in pediatric patients. The dose of local anesthesia should be calculated and appropriately diluted during its usage. Cases receiving local anesthesia should be kept under observation for sufficient period post procedure. Clinician should be vigilant with regard to local anesthetic toxicity in any child presenting with adverse events after circumcision or any other procedure.

## Acknowledgement

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## Conflict of Interest

None

## References

1. El-Boghdadly K, Pawa A, Chin KJ (2018) Local anesthetic systemic toxicity: current perspectives. *Local Reg Anesth* 11: 35-44.
2. Aminiahdashti H, Laali A, Nosrati N, Jahani F (2015) Recurrent seizures after lidocaine ingestion. *J Adv Pharm Technol Res* 6(1): 35-7.
3. Hakemi A, Rezvani Kakhki B, Sadrzadeh S M, Mousavi S M, Vafadar Moradi E (2019) A Case of Status Epilepticus Due to Topical Lidocaine Toxicity: A Case Report and Review of the Literature. *J Pediatr Rev* 10 (1): 57-60
4. Boparai JK, Chopra D, Pandey SK, Bhandari B (2019) Generalized seizure following lignocaine administration: Case report and literature review. *J Family Med Prim Care* 8(10): 3440-3442.
5. Moran LR, Hossain T, Insoft RM (2004) Neonatal seizures following lidocaine administration for elective circumcision. *J Perinatol* 24(6): 395-396.