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Short Communication

Lidocaine Spray Induced Seizures after Bronchoscopy

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ABSTRACT

Lidocaine spray is a commonly used local anesthetic to prevent gag reflexes in minimally invasive procedures, such as transesophageal echocardiography and bronchoscopy. Here, we report a case of a seventy-five-year-old female patient, who was scheduled for a bronchoscopy to rule out Pneumocystis carinii pneumonitis and developed a loss of consciousness with witnessed generalized tonic-clonic epileptic seizures following the use of lidocaine spray. The patient was subsequently intubated with 3 mg midazolam while oxygen was provided by a facemask at 6 liters/min. There were signs of respiratory acidosis in the blood gas analysis done post-intubation. The patient was intubated for only two hours by a mechanical ventilator and monitored overnight in the intensive care unit post successful extubation. Precautions should be taken to prevent rare adverse complications in all procedures that require local anesthesia.

Keywords: Lidocaine; Bronchoscopy; Epileptic seizure; Respiratory acidosis

INTRODUCTION

Lidocaine decreases the neuronal membrane's permeability to sodium ions which results in inhibition of depolarization with consequent blockade of conduction nerve impulses [1]. The 10% Lidocaine solution is used topically for airway anesthesia, typically by spraying from a metered-dose atomizer. Lidocaine is mainly metabolized by the liver [2-4]. It showed many adverse effects when used in different doses with literature reporting various safe doses. It has also shown neurotoxic effects especially when used in direct exposure to neuronal tissue. Several cases of epileptic seizures associated with lidocaine use have been reported. Most of these cases showed either topical or Intravenous (IV) Lidocaine association. In this report, a case of a female patient who developed epileptic seizures post-exposure to Lidocaine spray during a diagnostic flexible bronchoscopy done to rule out Pneumocystis Pneumonia (PCP).

ABOUT THE STUDY

A 75-year-old female patient with history of right sided breast cancer (status post-right mastectomy, metastatic to the adrenal gland/status post adrenalectomy, and vertebral bones, on chemotherapy), presented with increased daytime somnolence and oxygen desaturation to 87% of same day duration with no reported dyspnea at rest, nor upon exertion.

Upon her arrival to the emergency room, the patient was fully awake and conscious, with no notable distress. Vitals were within normal limits with SpO_2 of 88%. Laboratory findings were pertinent for increases in C-reactive protein with normal levels of complete blood count and electrolytes. Ct-scan of the chest (PE protocol) done upon presentation showed newly appearing bilateral central ground glass opacities with interlobular septal thickening suggestive of pulmonary congestion in the acute setting. A newly appearing 15 mm

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nodular density/partial consolidation of the left upper lobe posterior segment abutting the left major fissure. These findings raised suspicion of PCP lung infection, so the patient was scheduled for flexible bronchoscopy for sputum examination and diagnosis confirmation.

During her hospitalization, the patient's oxygen requirements improved gradually, requiring oxygen supplementation only upon exertion. Throughout her stay, the patient had no neurological deficit and no previously reported seizures. On the same day, prior to her bronchoscopy, the patient had an oxygen level of 92% on room air.

Pre-bronchoscopy, local anesthesia was done with Midazolam 3 mg and Lidocaine 10% Spray (several puffs in each nostril and in the mouth through the laryngoscope). Towards the end of the procedure and while retracting the bronchoscope, the patient experienced recurrent episodes of generalized tonic-clonic seizures that lasted a few seconds each, after which the patient did not regain her full consciousness. Following the administration of 3 mg of Dormicum, her airway was secured with an endotracheal tube with no recorded oxygen desaturation nor hypoxia on arterial blood gas. Concurrently to the intubation, a loading dose of two grams of Levipram were administered *via* Intravenous access.

Following cessation of the seizures, a brain MRI without gadolinium done showed no acute intracranial abnormality with mild chronic small vessel disease. An EEG was not done at the time due to sedatives given during her intubation.

The patient was then transferred to the intensive care unit for further monitoring, with no additional sedatives given. Two hours later, the patient was successfully extubated, and regained her full consciousness and orientation.

Bronchoscopy revealed PCP infection (positive RT-PCR) with negative test of the respiratory bacterial panel and respiratory viruses panel, so she was started on Bactrim 160/80 two tablets every 6 hours for three weeks.

The patient was followed once discharged home, off anti-epileptics and with no recurrence of symptoms over 6 months.

Flexible bronchoscopy is a safe procedure with rarely reported side effects, especially in the absence of recorded hypoxia as in our case. Lidocaine is frequently used as a local anesthetic and its adverse effects are considered rare and it has a concentration-dependent effect on seizures. Seizures following lidocaine injection or ingestion have been previously reported, with a higher incidence of partial seizures [5,6]. Seizures seem to occur when the dose of lidocaine administered exceeds 3 mg/kg [4]. Also, blind administration of large volumes of Lidocaine spray in the oral cavity exposes the patient to lidocaine toxicity risk without strict control of the absorbed dose. Most of the reported seizures resolved spontaneously post-benzodiazepine administration. However, special precautions should be taken to avoid any prolonged periods of hypoxia that could lead to brain injury. Moreover, cardiac arrhythmias and toxicity has been also encountered in intravenous lidocaine administration. Unintentional intravascular injection of local anesthetics during regional anesthesia produces severe cardiotoxic reactions, including hypotension, atrioventricular heart block, idioventricular rhythms, and life-threatening arrhythmias such as ventricular tachycardia and fibrillation and are usually the presenting signs of local anesthetic toxicity during general anesthesia [7].

Given the above stated cases, special precautions should be taken when lidocaine sprays are used in endoscopic procedures; with more attention in patients who have previously experienced seizures to prevent further lidocaine induced cardiac and systemic toxicity.

CONCLUSION

Similar to Intravenous (IV) and topical lidocaine, lidocaine sprays used in endoscopic procedures to numb the lining of the mouth and throat, also have a risk of inducing seizures. Clinicians must be aware of the potential risk of lidocaine toxicity and be careful while spraying patients' oral cavity not to overcome the safe dose limit. Unlike the other modes of administration, it would be difficult to control the maximum safe number of puffs used in lidocaine spray. In case of seizures occurring post local anesthesia, anti-epileptics should be administered as abortive treatment with airway protection if required.

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