CASE REPORT

IJETV Vol. 8, Issue 1, 2022 Print ISSN: 2394–6822 Online ISSN: 2395–4272

Review of Deaths Due To Lignocaine Hydrochloride Toxicity

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Abstract

Lignocaine hydrochloride is commonly used as an antidysrhythmic and local anesthetic agent. Death due to lignocaine hydrochloride toxicity due to its absorption from the vaginal mucosa is rare. Here, we report a case of a 19-year-old female with an alleged history of death post-sexual intercourse. There was a history of the application of lignocaine hydrochloride gel IP 2% in the vagina of the deceased before as well as after the sexual act. She was not feeling well post sexual activity and was taken to a nearby government hospital, where she was declared brought dead. Autopsy findings demonstrated hymenal laceration at the 6 o'clock position with frank bleeding. The mucosa of the anus was eroded at the 4 o'clock position. Generalized congestion was found in the visceral organs. The toxicological analysis detected lignocaine hydrochloride in the deceased's blood, urine, and vaginal and anal swabs. The present case highlights that the toxicity of lignocaine hydrochloride can be life-threatening and, as it is easily available as an over-the-counter drug, its use should be monitored.

Keywords: Absorption, Toxicity, Hymenal tear, Lignocaine Hydrochloride, Vaginal mucosa.

Int J Eth Trauma Victimology (2022). DOI: 10.18099/ijetv.v8i01.09

Introduction

Lignocaine hydrochloride is commonly used as an antidysrhythmic and local anesthetic agent. It is currently the most widely used local anesthetic.[1] Lignocaine is absorbed extensively following mucosal, intramuscular, rectal, transdermal, and inhalation pathways.[2] When the site of administration is well vascularized, absorption can be rapid. 3 Local application of Lignocaine can have severe toxic effects on the cardiovascular and neurological systems. Most of these have been seen in young children who were given doses higher than recommended for local use.[4] Systemic toxicity from local anesthetics is rarely seen but can be potentially lethal by causing seizures, arrhythmias, and cardiovascular collapse.[5] Death due to lignocaine hydrochloride toxicity from mucosa absorption is rare. Although there are some reported cases of an accidental and intentional poisoning with Lignocaine, these cases are rare and found mostly in healthcare establishments where Lignocaine is used.

Here, we report a rare case of death due to lignocaine hydrochloride toxicity.

A literature search showed few cases of death due to lignocaine hydrochloride toxicity from mucosal absorption; however, death due to absorption from the vaginal mucosa has not been reported to the best of the author's knowledge. These cases emphasize the need to raise awareness of lignocaine hydrochloride toxicity due to its widespread use and easy over-the-counter availability.

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How to cite this article: Parmar, V., Sharma, S., Arora, V. Review of Deaths Due To Lignocaine Hydrochloride Toxicity. Int J Eth Trauma Victimology. 2022;8(1):40-42.

Source of support: Nil

Conflict of interest: None

Received:30/03/2022; **Received in revised form:** 18/06/2022;

Accepted:30/06/2022; **Published:** 10/07/2022

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History

The deceased was a 19-year-old woman with no previous medical history. She had come with her male friend who was working in a private nursing home. There was a history of sexual intercourse and bleeding after sexual intercourse. As per the deceased's friend, he had applied lignocaine hydrochloride to the vagina of the deceased before as well as after the sexual act. The deceased started having vomiting episodes, complained of difficulty in breathing, and did not feel well after the sexual act. She was taken to a nearby government hospital, where she was declared brought dead.

Site Inspection

On visiting the hotel room, police found a condom packet, an empty wrapper of a condom, and an empty tube of lignocaine hydrochloride gel IP 2%.

Autopsy Findings

External examination showed an anatomically normal female with an average build, moderately nourished. The lips were bluish-discoloured. Fresh blood was coming out of the vagina. Hymenal Laceration/tear was appreciable at the 6 o'clock position. The Hymen was torn and the surrounding area, *i.e.,* vestibule up to the posterior commissure, was inflamed. The mucosa of the anus was eroded at the 4 o'clock position without any fresh bleeding.

An internal examination showed congestion of the organs. A 3x2 cm hemorrhage was present on the lower pole of the anterior surface of the left kidney. The heart was soft and flabby in consistency. The uterus was small in size and a creamish mucus-like substance was found in the cervix.

No other significant changes were observed that were relevant to the case.

Toxicological Findings

The toxicological analysis detected lignocaine hydrochloride in the deceased's blood, urine, and vaginal and anal swabs. The biological analysis report detected blood in the vaginal and anal swabs and slides. No alcohol or other drugs were detected.

Histopathological Findings

In the lungs, alveolar hemorrhages and edema were found. The kidneys showed tubular necrosis and congestion of the glomeruli and interstitium.

Further Analysis

There was no fatal bodily injury. The findings were consistent with a history of recent vaginal penetration. Lignocaine hydrochloride toxicity occurred due to its absorption from the vaginal, anal mucosa, and hymenal tears.

DISCUSSION

Lignocaine hydrochloride is a classic local anesthetic and is widely used in everyday practice. In 2011, Nath *et al.*[6] described the case of a 26-year-old male who developed neurotoxicity due to the absorption of Lignocaine from nasal sponges after anterior nasal packing. In 2005, Chang *et al.*[7] reported a case of an 87-year-old-man who had a cardiac arrest after intraurethral administration of Lignocaine as topical anesthesia for cystourethroscopy. In this case, intraurethral mucosal lesions from previous attempts at Foley catheter insertion led to a rapid elevation in the blood concentration of Lignocaine. In 2018, Rahimi *et al.*[8] studied the characteristics of acute lignocaine toxicity. They concluded that most cases of topical lidocaine toxicity were among < 40-year-old patients, with a male to female ratio of 1:2, suicidal attempts in 90%, the need for intensive care in 36.6%, and a mortality rate of 10%.

In 1983, Mofenson HC *et al.*[9] reported a case of an infant who experienced seizures while being treated with a topical lidocaine 2% solution for teething. In 1998, Day *et al.*[10] reported a case of a healthy 19-year-old college student volunteering in a clinical research program undergoing a bronchoscopy who died as a result of acute lignocaine toxicity.

The U.S. Food and Drug Administration (FDA) issued a warning on 6 February, 2009.[11-12] alerting consumers that skin creams with topical anesthetics can cause life-threatening side effects, including seizures, irregular heartbeats, and even death. The consumer alert came after the FDA reported the deaths of two women, aged 22 and 25 years, who died due to lignocaine overdose. They applied a numbing gel to their legs and then covered them with a plastic wrap following laser hair removal treatments. They had seizures, went into comas, and later died from the toxic effects of Lignocaine.

In our case, the deceased had no past medical history of any disease, allergies, hospitalization, or substance abuse. The deceased's friend had applied Lignocaine to the vagina both before and after the sexual act. As the whole tube was found empty, lignocaine overuse led to its rapid absorption from the hymenal tear and vaginal and anal mucosa. Moreover, no douching or washing off of the skin was done, which further led to the absorption.

Following the absorption of Lignocaine, the deceased developed headache, dizziness, nausea, vomiting, difficulty breathing, and was disoriented. She died due to lignocaine toxicity. Lignocaine is rapidly absorbed from the site, which is well vascularized.[13] After application, lignocaine cream should be washed off the hands completely. It should never be applied to broken skin.[14] Lignocaine should never be left on the skin for extended periods. Excessive dosage or short intervals between doses can result in high plasma levels and serious adverse effects.[15]

CONCLUSION

Lignocaine is commonly used as a topical anesthetic for numbing the skin during various medical and cosmetic procedures, both before and after the procedures. Death due to the absorption of lignocaine hydrochloride from the vaginal mucosa is a very rare occurrence. Our skin normally acts as a cover and protects us from countless insults. However, some medications can penetrate the skin and enter the bloodstream. From this case, we would like to highlight that the toxicity of Lignocaine can be life-threatening. One should be cautious when using products with Lignocaine. Topical Lignocaine is generally safe when used in fewer doses and as directed. However, if not used as directed or in greater quantities, it can lead to several adverse effects and even death. The chances of these adverse effects increase if Lignocaine is used in large amounts, if it is allowed to remain on the skin for long periods, or if it is applied over areas where the skin is not intact. Its easy over-the-counter availability has led to its widespread use, which should be monitored.

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