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Case Report

LAMOTRIGINE OVERDOSE: A CASE REPORT

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ABSTRACT:

Lamotrigine is a second-generation anticonvulsant and mood stabilizer commonly used to treat epilepsy and bipolar disorder. Although generally well tolerated, overdoses can cause significant toxicity affecting the central nervous and cardiovascular systems. We report a case of a 34-year-old female with conversion disorder who ingested 1000 mg of lamotrigine following an emotional distress episode. She presented with slurred speech, tachycardia, and lethargy but remained hemodynamically stable. Management included gastric lavage, activated charcoal, and supportive care, resulting in a favorable outcome without complications. This case highlights the importance of early intervention in lamotrigine toxicity and the need for psychiatric evaluation in at-risk patients.

Keywords: Lamotrigine, Overdose, toxicity

INTRODUCTION

Lamotrigine is a second-generation anticonvulsant drug which focuses on voltage-sensitive sodium channels, resulting in a reduction of the excitatory neurotransmitters glutamate and aspartate. This mechanism is believed to produce an inhibitory effect that stabilizes neurons. It is prescribed for managing both epilepsy and bipolar disorders (1). Lamotrigine is typically well tolerated, and adverse effects are reported in 8–20% of patients, which include dizziness, drowsiness, nausea, weakness, and headaches (2). Studies have indicated that single-agent lamotrigine overdoses, with doses varying from 100 mg to 40 gm and serum concentrations between 15.5 and 74.7 mg/L, are connected to a wide array of toxic effects that influence the central nervous and cardiovascular systems, in addition to hypersensitivity-like reactions (2). We present the case of a 34-year-old patient who experienced a lamotrigine overdose of 1000 mg, with a background of conversion disorder.

CASE REPORT

A 34-year-old female presented to the Emergency Department at 19:00 hours on September 13, 2024, following a reported overdose of 1000 mg of lamotrigine, taken approximately one and a half hour prior to arrival. She was a known case of conversion disorder and had been discharged from the hospital on September 7, 2024. Her condition was previously well-controlled with medication, with only one seizure episode reported since discharge. According to her brother, the patient had also experienced episodes of panic attacks. She believed that her family does not love or care for her. A few days before the incident, her mother and sister visited Quetta and were expected to return on a particular day. However, their delayed return caused the patient to feel down and depressed. In her distressed state, she ingested 20 tablets of lamotrigine (50 mg each). Following this, she developed symptoms of irrelevant speech, prompting her family to bring her to the Emergency Department.

On arrival, the patient was oriented and hemodynamically stable. Her vital signs were as follows: blood pressure of 108/72 mmHg, oxygen saturation of 97% in room air, respiratory rate of 21 breaths per minute, and pulse rate of 114 beats per minute. She responded appropriately to the questions but exhibited pronounced slurring of speech. An electrocardiogram (ECG) was performed, showed normal findings with no widening of the QRS complexes. Arterial blood gases, electrolytes, and blood urea levels were all within normal limits presented in Table 1. MRI scan was done which shows normal findings (Figure 1 a and b).

MANAGEMENT

A large bore IV line of 20 gauge was passed along with NG tube on the arrival. Gastric lavage was done with activated charcoal and the patient was hydrated with Normal saline 0.9% at a rate of 100 ml/hr. The patient was kept nothing per oral for initial 12 hours. The patient was then admitted to the internal medicine department for observation under the line of drug overdose. Due to the timely interventions the patient did not develop any

complications and due to the underline psychiatric issue she was referred to psychiatric ward for further management.

Table 1. Laboratory findings of the patient with lamotrigine overdose

Labs	Value	Labs	Value
Hb	11.7mg/dl	PH	7.38
WBCs	9.7 x10E9/L	PCO2	36.3mmHg
PLT	275 x10E9/L	PO2	36.7mmHg
BUN	7mg/dl	CPK	50 I.U/L
Trop I	<2 ng/L	BIC	21mEq/L
Crit	0.8mg/dl		

(Hb= Haemoglobin, WBCs= white Blood Cells, PLT= Pletelets, BUN= Blood Urea Nitrogen, Trop I= Troponin I, Crit= Creatinine)

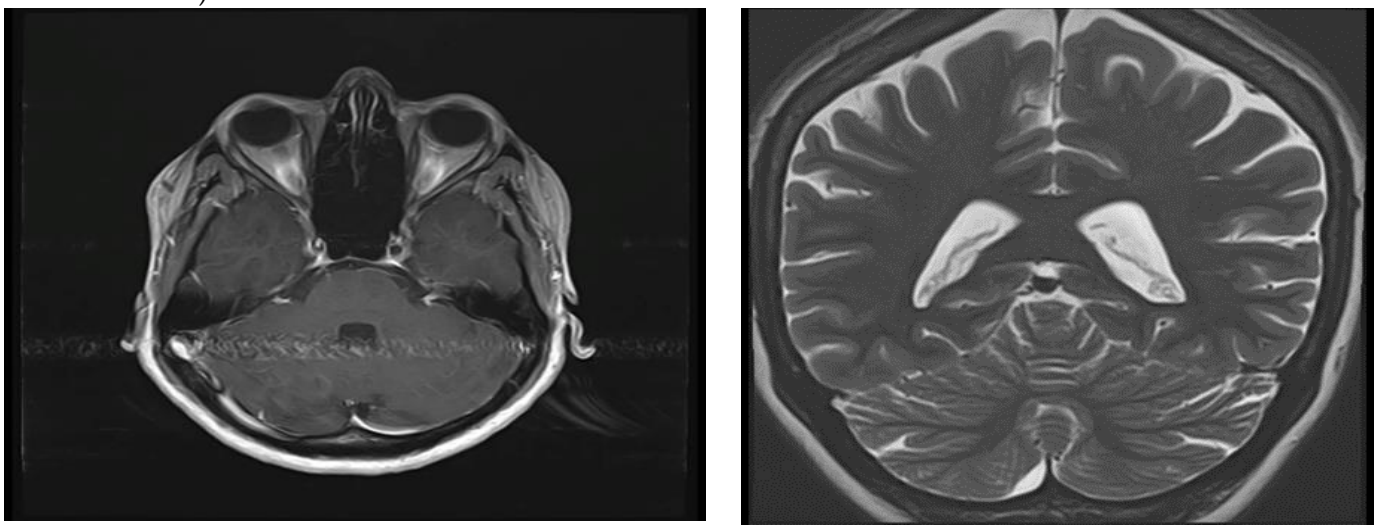

Figure 1. MRI scans of the patient presenting with lamotrigine overdose

DISCUSSION

Our Lamotrigine, a phenyltriazine derivative, is an antiepileptic and mood stabilizer used for bipolar disorder and epilepsy. It inhibits voltage-gated sodium channels, stabilizing neuronal membranes and reducing excessive glutamate release, which prevents hyperexcitability and excitotoxicity. Its weak inhibition of calcium channels may further enhance its antiepileptic effects, contributing to seizure control and mood stabilization (1, 3). Lamotrigine was prescribed to our patient due to a known case of conversion disorder and for mood stabilization.

Lamotrigine can lead to severe skin rashes that may necessitate hospitalization and the cessation of the medication. The intensity of these rashes can differ, with a possible risk of developing Stevens-Johnson syndrome (4). The most prevalent clinical effects of lamotrigine overdose include nausea, vomiting, dizziness or vertigo, ataxia, nystagmus, drowsiness, lethargy, and tachycardia. Rare but serious effects can include cardiovascular shock, respiratory depression, seizures, coma, and systemic allergic reactions affecting multiple organs (5, 6). Our patient exhibited lethargy and tachycardia among the signs and symptoms discussed above.

The outcome of lamotrigine overdose is influenced by various factors, including sex, age, underlying health conditions, and the concurrent use of other medicines. Age plays a crucial role in determining the clinical effects of lamotrigine overdose; for instance, children who ingest large amounts of lamotrigine may experience generalized seizures (7). Seizures are reported in adults, although they occur less frequently than in children (8). Our patient did not experience any seizure episodes during her hospital stay.

The management of lamotrigine toxicity primarily depends on the clinical effects observed and may include interventions to inhibit additional absorption of the ingested lamotrigine, such as performing gastric lavage and administering activated charcoal (2). It is recommended to administer sodium bicarbonate for alkalinization when there is a suspicion of cardiotoxicity resulting from sodium channel blockade (9). In the case of our patient, we performed gastric lavage with activated charcoal.

A continuous veno-venous hemodiafiltration (CVVHDF) was successfully utilized to regulate the lamotrigine level in a patient when other therapeutic modalities failed to respond. Furthermore, intravenous rifampin was administered as an adjunct therapy to enhance the metabolism of lamotrigine (10).

CONCLUSION

In conclusion, while lamotrigine is generally well tolerated at normal doses and even in some instances of overdose, there is clear evidence of significant toxicity associated with overdose, leading to variable outcomes. Most patients may experience complete recovery; however, there have also been reports of fatalities. It is essential to consider the toxic profile of lamotrigine when prescribing it to patients who may be at higher risk for overdose. This consideration should be part of a comprehensive risk-benefit analysis, especially given the increasing use of lamotrigine as a long-term treatment in psychiatric populations.

Acknowledgement

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Conflict of Interest

Authors declare no conflict of interest.

Ethical consideration

Informed consent was taken from the patients for publishing this case report

REFERENCES

1. Betchel NT, Fariba KA, Saadabadi A. Lamotrigine. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 [cited 2024 Nov 17]. Available from: http://www.ncbi.nlm.nih.gov/books/NBK470442/
2. Alabi A, Todd A, Husband A, Reilly J. Safety profile of lamotrigine in overdose. Ther Adv Psychopharmacol. 2016 Dec 1;6(6):369–81.
3. Ketter TA, Manji HK, Post RM. Potential mechanisms of action of lamotrigine in the treatment of bipolar disorders. J Clin Psychopharmacol. 2003 Oct;23(5):484–95.
4. Tomson T, Battino D, Perucca E. Teratogenicity of antiepileptic drugs. Curr Opin Neurol. 2019 Apr;32(2):246–52.
5. Fleurat M, Smollin C. Case files of the University of California San Francisco Medical Toxicology Fellowship: lamotrigine toxicity. J Med Toxicol Off J Am Coll Med Toxicol. 2012 Mar;8(1):52–8.
6. Karaoulanis SE, Syngelakis M, Fokas K. Rhabdomyolysis after lamotrigine overdose: a case report and review of the literature. Ann Gen Psychiatry. 2016 Dec;15(1):6.
7. Close BR, Banks CJ. Seizures Secondary to Lamotrigine Toxicity in a Two-Year-Old. Ann Pharmacother. 2010 Jun 1;44(6):1112–5.
8. Dinnerstein E, Jobst BC, Williamson PD. Lamotrigine intoxication provoking status epilepticus in an adult with localization-related epilepsy. Arch Neurol. 2007 Sep;64(9):1344–6.
9. Castanares-Zapatero D, Wittebole X, Huberlant V, Morunglav M, Hantson P. Lipid emulsion as rescue therapy in lamotrigine overdose. J Emerg Med. 2012 Jan;42(1):48–51.
10. Li Y, Ang HS, Fatehi P, Htet N. The Roller Coaster of Lamotrigine Levels: Successful Treatment of Massive Lamotrigine Overdose With Continuous Veno-Venous Hemodiafiltration and Rifampin. Cureus. 2024 Jul;16(7):e65637.