

CASE REPORT

Heavy head lice infestation in an adolescent girl following benzodiazepine poisoning

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Funding information

None

Abstract

Loss of consciousness (LOC) is one of the most common causes of emergency department (ED) visits. It may be due to intoxication or hypoglycemia. We present a 15-year-old girl who was referred with heavy head lice and LOC to the ED in the north of Iran.

KEYWORDS

head lice, hypoglycemia, intoxication, loss of consciousness

1 | INTRODUCTION

Loss of consciousness (LOC) is one of the most common causes of emergency room visits. According to Björkman et al., the epidemiology and etiology of decreased level of consciousness in pre-hospital non-trauma patients are seizures, hypoglycemia, intoxication, intracranial and subarachnoid hemorrhage, infections, malignant tumors, occult traumatic brain injury, and impaired level of consciousness without obvious or specific cause.¹ Intoxications may have the potential for complete recovery if they have been identified on time. Therefore, the most common causes of intoxication-related LOC include carbon monoxide, alcohol, opiates, sedatives-hypnotics, cholinergic, tricyclic antidepressant poisoning, and serotonergic syndrome should be considered.²

Benzodiazepines (BZD) are one of the most available agents widely administered as sedatives-hypnotics, anxiolytics, anticonvulsants, and muscle-relaxants. The clinical presentation of BZD overdose ranges from dizziness and confusion to coma and respiratory depression, which are conclusive of the interaction with gamma-aminobutyric acid-A (GABA-A) receptors.³ Hypoglycemia due to BZD poisoning is being broadly investigated and has conflicting results.⁴ However, it has been proven that BZDs can affect glycemic regulation through the effect of GABA-A stimulation on insulin secretion.⁵ Hence, the occurrence of hypoglycemia following BZD intoxication needs to be considered.

Head lice (*Pediculus humanus capitis*) are external parasites living on the different parts of human and animal bodies. It is one of the important public health problems,

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particularly in developing countries, that usually infects children aged 5–13 years old and imposes a lot of direct and indirect costs on the health system.^{6,7} Populous low-income countries with low levels of personal hygiene, such as homeless individuals, are more prone to infection and transmission.⁸ Patients often present with itching or mild burning of the scalp as a result of the inflammation of the skin.⁹ This is a 15-year-old girl with a lot of head lice in her hair, who was referred to the emergency ward with hypoglycemia-induced LOC and a history of BZD use.

2 | CASE PRESENTATION

On October 10, 2021, a 15-year-old girl was referred with a loss of consciousness to the emergency room in the north of Iran. The vital signs at baseline were as follows: Blood pressure (BP): 100/60 mmHg, pulse rate (PR): 65 beats/minute, temperature: 37°C, respiratory rate (RR): 18 beats/minute, and oxygen saturation (O₂ sat): 97%. On physical examination, she had reactive miotic pupils and responded to the painful stimulation, breathed spontaneously, and her respiratory auscultation sounds were normal. The abdominal examination did not reveal distention and had no tenderness. About 100 mature lice and a large number of lice eggs (Nits) are isolated from the patient's scalp. Numerous scratch marks were observed on her scalp skin and heavy head lice were seen in her hair (Figure 1).

The results of baseline laboratory tests are in Table 1. All values were in the normal range, with the exception of blood sugar and amylase. She was severely hypoglycemic at presentation to the emergency room (blood glucose [BS] = 40 mg/dl) with no seizure. Abdominal sonography was performed according to the amylase value of 1008 U/L, which was normal, and there was no organomegaly. The



FIGURE 1 Numerous scratch marks and scaling were observed on her scalp skin

TABLE 1 Baseline laboratory results

Parameter	Value	Reference value	Unit
Na	139	135–145	mEq/L
K	3.9	3.5–5	mEq/L
BUN	13	7–20	mg/dl
Cr	0.7	0.5–1	mg/dl
Ca	9.4	8.5–10.5	mMol/L
Mg	1.8	1.7–2.2	mg/dl
P	3.3	2.5–4.5	mg/dl
TG	120	Less than 150	mg/dl
Total cholesterol	100	Less than 200	mg/dl
BS	40	80–140	mg/dl
Amylase	1008	40–140	U/L
AST	43	10–40	U/L
ALT	13	10–40	U/L
ALP	121	20–140	U/L
Bilirubin total	0.8	0.1–1.2	mg/dl
Bilirubin direct	0.3	Less than 0.3	mg/dl
pH	7.35	7.35–7.45	
PCO ₂	34.6	35–45	mmHg
HCO ₃	19.4	19–27	mMol/L

urine multi-drug assessment was positive for benzodiazepine. In obtaining the supplementary history, it was found that she had a history of clonazepam consumption. Considering the increased amylase and severe hypoglycemia, hydration was started with dextrose water 10% at a rate of 100 ml/h. Serial checking of amylase and BS showed a trend toward a normal range (Table 2). Forty-eight hours later, the patient was completely oriented with no gastrointestinal or central nervous system symptoms. Due to the heavy head lice, dermatology consultation was requested and the patient was treated with lindane shampoo 1% (Gamma benzene hexachloride) too. Finally, after a week, she was discharged in good condition. Written informed consent was obtained from the patient's next of kin to publish this report in accordance with the journal's patient consent policy. This study was conducted according to the Declaration of Helsinki Principles. Also, CARE guidelines and methodology were followed in this study.

3 | DISCUSSION

Loss of consciousness is one of the most important causes of referral to the ED, which is potentially life-threatening. First, it is crucial to apply the resuscitation steps and concurrently distinguish the definite cause. Sometimes, "coma cocktail" (dextrose, naloxone, thiamine, and oxygen) is

TABLE 2 Amylase and Blood sugar values during the time

Time	Baseline	12 h	24 h	36 h			
Amylase	1008	700	284	248			
Time	Baseline	1 h	2 h	3 h	5 h	7 h	9 h
BS	40	59	78	90	102	111	120

empirically administered to the comatose patient, and it is nearly safe.¹⁰ Due to the high prevalence of drug abuse in this population, a urine multi-drug assessment should be obtained. Also, there are some main metabolic causes of LOC such as hypoglycemia, hyponatremia, hypoxia, and hyperventilation that need to be ruled out.

A recent study by Soroosh et al¹¹ revealed an 11.8% prevalence of BZD intoxication-induced hypoglycemia (BZD-IH) compared to 2.8% in poisoning with drugs other than BZD. Also, in another retrospective cross-sectional study on 61 patients with pure BZD intoxication, the prevalence of hypoglycemia was as high as 31.2%, which was predicted by the use of BZD for suicidal attempts and higher RR at baseline. BZD-IH appears to be more common in older males, those with a lower Glasgow Coma Scale (GCS), a longer time from ingestion to admission, and no pre-hospital treatments.⁴ Although our case was a young girl, she experienced severe BZD-IH. She did not remember the time of the last dose of clonazepam and there was no pre-treatment before admission.

Hypoglycemia is classified as mild, moderate, or severe, and symptoms can include dizziness, sweating, hunger, palpitation, or more severe symptoms such as seizure and coma. When the blood glucose level drops below 40 mg/dl, the patient is more susceptible to seizures.¹² Interestingly, hypoglycemia in this case was not associated with any seizure, which is expected at the BS level of 40 mg/dl, and can be explained by the history of clonazepam use.

Another interesting point about this case was her head lice infection, which was incidentally diagnosed and treated appropriately following her acute condition that necessitated ED referral. The importance of this issue is due to the expeditious transmission potential of this infection if left untreated, especially in the student population.

However, we do not have exact information about the amount of clonazepam used, based on the positive urine assessments; it could be considered another cause of her LOC secondary to the BZD-induced CNS depression.

4 | CONCLUSION

Benzodiazepines poisoning and its following hypoglycemia is one of the most important causes of LOC, especially in individuals who are homeless or have low

socioeconomic status. Therefore, appropriate and timely diagnosis and treatment of the causes of LOC seems necessary. This report reminds us of the importance of evaluation of contagious diseases like head lice in LOC patients with low socioeconomic status.

ACKNOWLEDGEMENT

Declared none.

CONFLICT OF INTEREST

The authors confirm that this article content has no conflict of interest.

AUTHOR CONTRIBUTIONS

ZZ, ZN, and MM contributed to the interpretation and collection of data and editing of the manuscript. MF and Ash involved in writing, editing, and preparing the final version of the manuscript. MS is responsible for submitting the manuscript. All authors reviewed the paper and approved the final version of the manuscript.

CONSENT

Written informed consent was obtained from the patient's next of kin to publish this report in accordance with the journal's patient consent policy.

DATA AVAILABILITY STATEMENT

The data is available to the correspondent author and can be obtained upon request.

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How to cite this article: Moghimi M, Nekoukar Z, Sharifpour A, Zakariaei Z, Fakhari M, Soleymani M. Heavy head lice infestation in an adolescent girl following benzodiazepine poisoning. *Clin Case Rep*. 2022;10:e05324. doi:[10.1002/ccr3.5324](https://doi.org/10.1002/ccr3.5324)