

Case Report

Jimsonweed Intoxication Management in a Diabetic Patient: A
Case Report

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**Abstract**

Jimsonweed (*Datura stramonium*), a wild plant containing tropane alkaloids such as atropine and scopolamine, is historically used in folk medicine but poses significant risks of anticholinergic toxicity when ingested. This case report describes a 58-year-old diabetic woman who intentionally consumed a large quantity of Jimsonweed as an alternative to metformin for glycemic control, resulting in severe anticholinergic poisoning. Upon admission, she exhibited loss of consciousness, tachycardia (HR 150 bpm), mydriasis (pupils 9 mm, non-reactive), dry mucous membranes, and a prolonged QT interval on ECG. Laboratory findings ruled out diabetic ketoacidosis (BS 356 mg/dL, no ketonuria), while toxicology screens excluded other common toxins. Notably, the patient's history revealed a month-long substitution of prescribed metformin with Jimsonweed tea, influenced by local beliefs in its hypoglycemic properties. Given her diabetes and absence of delirium, physostigmine was contraindicated; instead, management included gastric lavage, activated charcoal, IV fluids, cardiac monitoring, and sodium bicarbonate for QT prolongation. Her ECG normalized within 4 hours, and she regained full consciousness after 6 hours. A 24-hour cardiac monitoring showed no arrhythmias, and she was discharged with resumed metformin therapy. At follow-up, her diabetes was well-controlled. This case underscores the dangers of herbal remedy misuse in chronic disease management and highlights the efficacy of conservative treatment in Jimsonweed intoxication. It also emphasizes the need for public education on the risks of unverified traditional therapies, particularly among diabetic patients.

Keywords: *Datura stramonium*; Anticholinergic Poisoning; Diabetes Mellitus; Sodium Bicarbonate; Plant Toxicity; Folk Medicine; QT Prolongation.

Introduction

Jimsonweed, or *Datura stramonium* (*D. stramonium*), is a wild plant from the genus *Datura*. These herbs are known for producing tropane-type alkaloids such as scopolamine and atropine [1]. The alkaloid components act as acetylcholine antagonists at muscarinic receptors, resulting in anticholinergic effects [2]. *Datura* species are also considered to have antioxidant, antibacterial, fungicidal, insecticidal, hypoglycemic, and even psychoactive effects, contributing to their increasing application [1]. Tropane alkaloid poisoning used to occur when plants were accidentally mixed with food in the past. However, today, reports of Jimsonweed intoxication (JWI) are due to intentional consumption, especially for its psychoactive effects [1, 3]. Applying any part of Jimsonweed may cause severe anticholinergic symptoms, possibly resembling atropine poisoning, which can

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complicate diagnosis. symptoms include dryness of the mucous membranes and skin, excessive thirst, tachycardia, dilated pupils, hallucinations, confusion, loss of consciousness (LOC), and may ultimately lead to death [4, 5].

This report presents a case of a diabetic woman with JWI, who used *D. stramonium* based on local folk medicine beliefs to control blood sugar (BS) and was admitted to the hospital with LOC. There are few publications on JWI in Iran, and this case report focuses on an unusual presentation and its diagnostic and management challenges.

Case Presentation

A 58-year-old Caucasian woman was admitted to the emergency ward with LOC about an hour before admission. Her son reported that she became unresponsive about an hour after consuming a large meal and herbal tea. For days, she exhibited restlessness and hallucinations (e.g., seeing insects), which went unaddressed by her family. The patient had diabetes mellitus (DM) and had refused conventional medication, opting instead to use herbal tea to control her BS. She had no history of psychiatric disorders, drug abuse, or recent head trauma.

On examination, her vital signs were Blood Pressure 170/80 mmHg, Respiratory Rate 16 breaths/min, Heart Rate 150 beats/min, Oxygen Saturation 95%, and temperature 37.2°C. She had a Glasgow Coma Scale score of 10 out of 15, with bilateral mydriasis and pupils dilated to 9 mm, not reactive to light. Her skin and mucous membranes were dry, and her face was flushed. Suspecting diabetic ketoacidosis, brain abnormalities, or drug toxicity, particularly anticholinergic toxicity, an investigation was initiated.

An electrocardiogram (ECG) showed sinus tachycardia with a prolonged QT interval (Figure 1). Further laboratory evaluation revealed a BS level of 356 mg/dL, venous blood gas (VBG) results of pH 7.40, PCO₂ 39.2 mmHg, HCO₃ 23.8 mmol/L, and urine pH of 5.9 with glucosuria but without ketonuria (Table 1), ruling out diabetic ketoacidosis. Toxicology screens were negative for alcohol, benzodiazepines, amphetamines, marijuana, tricyclic antidepressants, and opiates. A brain computed tomography (CT) scan without contrast revealed no abnormality. Anticholinergic poisoning was considered and confirmed when a large amount of herbal tea containing Jimsonweed was found in her house (Figure 2). Her son reported that she believed Datura could reduce BS and had been using it instead of metformin, which her endocrinologist had prescribed, for a month.

Table 1. Overview of the patient's laboratory results.

Parameters	At Admission	After 6 hours	On Discharge	Normal Range
Blood Sugar	356	182	127	70-140 mg/dL
HbA1c	7.5	7.5	7.4	Below 5.7%
Venous pH	7.40	7.45	7.41	7.35-7.45
Venous HCO ₃	23.8	24.5	23.9	22-28 mmol/L
Venous PCO ₂	39.2	41.7	40.1	35-45 mmHg
Base Excess	-1	+0.5	-0.5	-2 to +2 mmol/L
White Blood Cell	9,920	9,618	9,076	4,500-11,000 cells/ μ L
Platelet	225,000	218,000	221,000	150,000-450,000 cells/ μ L
Hemoglobin	13.6	13.3	13.4	12.1-15.1 g/dL (Female)
Myoglobin	71	62	39	0-85 ng/mL
Sodium	136	139	138	135-145 mmol/L
Potassium	4.1	3.7	3.9	3.5-5.0 mmol/L
Alanine Aminotransferase	52	53	51	7-56 U/L
Aspartate Aminotransferase	28	26	26	10-40 U/L
Alkaline Phosphatase	66	59	70	44-147 U/L
Creatine Phosphokinase	178	187	191	20-200 U/L
Troponin T	<0.01	<0.01	<0.01	<0.1 ng/mL
Creatinine	1.0	1.1	1.1	0.6-1.2 mg/dL
Blood Urea Nitrogen	18	16	13	7-20 mg/dL



Urine Glucose (Dipstick)	positive	positive	Negative	Negative
Urine Ph (Dipstick)	5.9	6.4	6.2	4.5-8.0
Urine Ketone (Dipstick)	Negative	Negative	Negative	Negative
International normalized ratio	1.23	1.19	1.19	0.85-1.25
Partial thromboplastin time	33.6	33.7	32.8	25.3-34.6 seconds

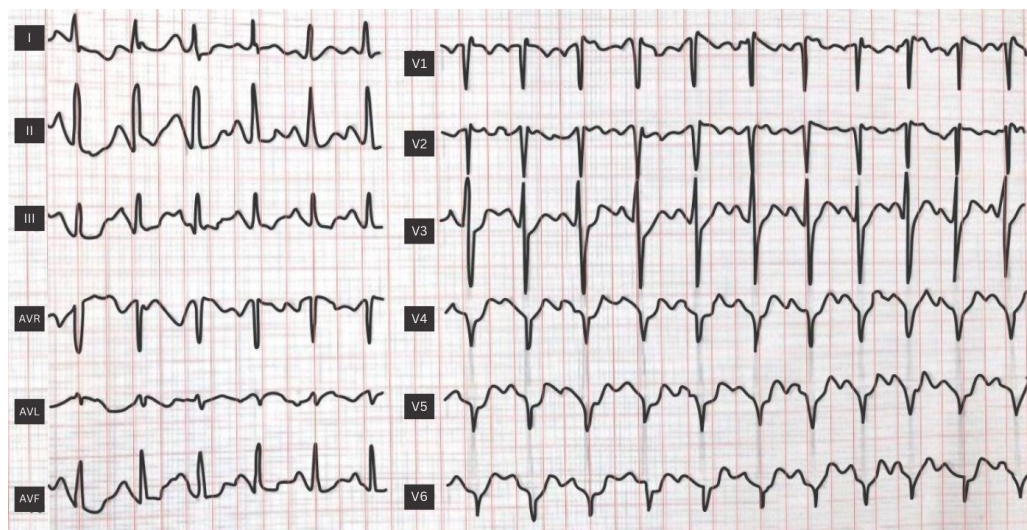


Figure 1. Initial electrocardiogram of the patient, demonstrating tachycardia and a corrected prolonged QT interval.



Figure 2. Image of jimsonweed found in the patient's residence, which she had boiled and consumed as a herbal remedy.

Although anticholinergic poisoning was suspected, physostigmine was not administered due to contraindications in DM and the absence of agitation or delirium in the patient. Conservative management was initiated, including simple oxygen face masks, fluid therapy, cardiopulmonary monitoring, a foley catheter for possible urinary retention, and fluid input-output control. Gastric lavage was also performed, and charcoal was administered via a nasogastric tube. Sodium bicarbonate was initiated due to the adverse effect of sodium channel blockage. VBG, electrolyte tests, and urine analysis were repeated every 2 hours to assess the risk of severe alkalization and electrolyte imbalance. Additionally, Serial ECGs were performed. Insulin was also started after the initial potassium result of 4.1 mmol/L.

After 4 hours, the ECG showed normalization of the QT interval, and her vital signs were Blood Pressure 130/70 mmHg, Respiratory Rate 20 breaths/min, and Heart Rate 95 beats/min. Despite improvement in vital signs, her consciousness remained decreased. After 6 hours of admission, she regained full consciousness but was disoriented regarding location and time for one hour. She underwent 24-hour cardiac monitoring, which revealed no complications or arrhythmia. Her vital signs and ECG were normal, and no behavioral abnormalities were observed. Upon consultation with an endocrinologist, the patient resumed her recent DM management regimen of metformin. A three-month follow-up showed good compliance, and her DM was regularly controlled with the dietary guidance of a nutritionist.

Discussion

D. stramonium, also known as thorn apple, green dragon, stinkweed, and angel's trumpet, is an annual plant in the Solanaceae family. It has been used for centuries in folk medicine to treat conditions such as asthma, intestinal cramps, nocturia, diarrhea, sinus infections, and ulcers. Additionally, it has hallucinogenic effects and has been used for religious purposes [1, 5]. *Datura* contains numerous components, including phytochemicals such as phenolic compounds, flavonoids, tannins, cardiac glycosides, and alkaloids particularly abundant in tropane alkaloids, such as scopolamine (also known as hyoscyne), hyoscyamine, and atropine [6]. The hypoglycemic effects of *Datura* species have been studied. While *Datura metel* significantly decreased BS levels in diabetic rats, the hydroethanolic extract obtained from *D. stramonium* root did not exhibit significant hypoglycemic activity, except at high oral doses of 100, 200, and 400 mg/kg. This challenges the local folk medicine belief that angel's trumpet can reduce BS, which led our patient to overuse *Datura* to control BS instead of taking effective medications that didn't control BS and HbA1c in our case.

The first recorded instance of JWI occurred in 1676 when a group of soldiers near Jamestown mistakenly consumed Jimsonweed in a salad. However, its use for hallucinogenic purposes became famous in the 1960s [7]. In 1998, 152 cases were reported in the United States, but the true prevalence seems to be higher [2]. Ingesting any part of *D. stramonium* may cause JWI, with the seeds being the most potent. In addition to eating the seeds or intact flowers, drinking the water in which it has been boiled and smoking the dried plant are other ways of consumption [7].

JWI typically manifests 30-60 minutes after consumption as anticholinergic toxicity. The diagnosis of poisoning is based on clinical manifestations [2, 4]. Symptoms include dilated pupils, hazy vision, flushing, and an atropine rash on the chest, neck, and face. Additional symptoms are limb jerking, anxiety, hyperactivity, and restlessness, which may lead to muscle weakness. Hypoventilation, respiratory depression, respiratory arrest, vasodilation, tachycardia, and dysrhythmias could occur. Respiratory and cardiovascular collapse can lead to death [7, 8]. Urinary retention and low peristalsis may occur. Additionally, hyperthermia, which can cause high fever in children, may lead to rhabdomyolysis and damage to the kidneys, liver, and brain [4]. Neurological symptoms include ataxia, psychosis, agitation, delirium, seizures, disorientation, confusion, and coma [4]. *Datura* users are often unaware of their hallucinations and usually cannot remember the intoxication event [7]. Psychosis typically passes after 12 hours, and the clinical symptoms usually resolve after 24 to 26 hours but may persist up to 48 hours [1].

Management of JWI primarily involves symptomatic and supportive care that requires monitoring until symptoms have completely resolved. This includes monitoring of airway patency, vital signs, circulation, and urine output [4]. Jimsonweed is usually absorbed quickly, but gastrointestinal motility induced by alkaloids may cause food to remain in the stomach for hours. Therefore,



if several hours have passed since consumption, induced emesis is still indicated. A stomach lavage followed by activated charcoal is also recommended, and magnesium sulfate as a cathartic is beneficial [1]. Physostigmine, an acetylcholinesterase inhibitor, is an FDA-approved medication for managing anticholinergic toxicity. It can cross the blood-brain barrier and affect the central nervous system, making it recommended for severe delirium, but its administration may cause cholinergic toxicity and is contraindicated in patients with DM. Therefore, its use requires approval from a toxicology team [4, 8, 9]. In our case, due to the absence of delirium and agitation, and the contraindication to injection due to the patient's diabetes and the inability to quickly access it in our hospital, physostigmine was not administered. The patient was fully conscious 7 hours after admission, was aware of time and place, and exhibited no acute neurological symptoms. This demonstrates the importance of conservative treatment and monitoring, as the patient responded well without acetylcholinesterase inhibitors.

Benzodiazepines are another treatment option for delirium and agitation, and they are beneficial in managing traumatic injuries, hyperthermia, and rhabdomyolysis. Sodium bicarbonate infusion is used specifically for treating arrhythmias, but it may cause abnormalities, metabolic alkalosis, and volume overload [8, 10]. Sodium bicarbonate mitigates cardiac toxicity and prevents fatal outcomes by alkalinizing the serum and displacing the sodium channel blocker with anticholinergic properties from its receptor site. Sinus tachycardia is common, but torsades de pointes, which a prolonged QT interval may trigger, is uncommon [11]. Bicarbonate intake was carefully monitored, and no serum or urine alkalosis occurred. The cardiac response to bicarbonate was excellent, with a positive response observed from administration. The patient's ECG returned to normal after 4 hours, and no arrhythmias were observed.

Limitations

While this case report provides valuable insights into the management of Jimsonweed intoxication in a diabetic patient, several limitations should be acknowledged. First, the findings are based on a single case, which limits generalizability to broader populations. Second, the decision to avoid physostigmine—though justified by the patient's diabetes and lack of delirium—means its potential efficacy in this scenario remains unexplored. Third, the absence of quantitative toxicology (e.g., serum tropane alkaloid levels) restricts the ability to correlate symptom severity with toxin concentration. Finally, the report does not explore potential cultural or socioeconomic factors influencing the patient's reliance on folk remedies, which could provide further context for preventive strategies.

Conclusion

This case highlights the serious risks of using *D. stramonium* as a perceived remedy, especially in diabetic patients who may turn to folk medicine. The patient faced severe symptoms, managed successfully with conservative treatment and sodium bicarbonate without the use of physostigmine. The absence of serum or urine alkalosis and the normalization of ECG findings after bicarbonate administration underscore the importance of careful monitoring and supportive care. It also emphasizes the need for awareness and education regarding the risks associated with the use of traditional herbal remedies, especially those with potent pharmacological effects.

Abbreviations

BS: Blood Sugar; **DM:** Diabetes Mellitus; **ECG:** Electrocardiogram; **LOC:** Loss of Consciousness; **HR:** Heart Rate; **BP:** Blood Pressure; **RR:** Respiratory Rate; **SpO₂:** Oxygen Saturation; **GCS:** Glasgow



Coma Scale; **VBG**: Venous Blood Gas; **HCO₃⁻**: Bicarbonate; **PCO₂**: Partial Pressure of Carbon Dioxide; **CT**: Computed Tomography; **NG tube**: Nasogastric Tube; **IV**: Intravenous; **HbA1c**: Hemoglobin A1c; **BUN**: Blood Urea Nitrogen; **WBC**: White Blood Cell; **CPK**: Creatine Phosphokinase; **ALT**: Alanine Aminotransferase; **AST**: Aspartate Aminotransferase; **INR**: International Normalized Ratio; **PTT**: Partial Thromboplastin Time; **JWI**: Jimsonweed Intoxication; **FDA**: Food and Drug Administration.

Ethical approval

This case report was approved by the Research Ethics Committee of Arak University of Medical Sciences (Approval ID: **IR.ARAKMU.REC.1401.297**).

Availability of data and materials

Data will be accessible to other authors and readers upon reasonable request.

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Authors' Contribution

S.N.: Conceptualization, Supervision, Project Administration, Resources. **M.S.**: Writing – Original Draft, Writing – Review & Editing, Data Curation, Visualization. **S.A.Y.**: Investigation, Methodology, Validation. **E.A.D.**: Investigation, Methodology. **M.S.Z.**: Writing – Review & Editing, Visualization, Validation.

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Consent for publication

Written consent was obtained from the patient. No identifiable information or images were included.

Competing interests

The authors declare no competing interests.

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