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Intoxication Due to Consumption of Boiled Datura Stramonium (Kecubung) Leaves

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Abstract: Datura stramonium has medicinal properties that make it suitable for treating respiratory system conditions, haemorrhoids, dermatological, for treating dental infections and toothache, skin infections, alopecia, decreasing abdomen colicky pain, and also to reduce pain. When it affects the central nervous system, it can lead to delirium symptoms such as restlessness, agitation, hallucination, convulsion, coma, and even death. **Case Report:** We report the case of a 59 years old, female, drink 3 glasses of boiled water of Datura stramonium leaves to reduce the pain in her waist, then she appears to be hallucinating by talking to herself. Pupil showed bilateral mydriasis. The patient got 500 cc of 0.9% NaCl in 1 hour and oxygenation. After 5 hours, the patient regained consciousness. **Discussion:** The presence of mydriasis, is a common symptom in nearly all cases of anti-cholinergic intoxication, including Datura stramonium. Fever and erythema may occur due to vasodilation and the inhibition of sweat glands. Additional symptoms that may occur in instances of Datura intoxication include visual hallucinations. Onset of symptoms may occur within 30-60 minutes following exposure. For the majority of patients, this condition resolves spontaneously without intervention and does not pose a risk to their lives. In severe case have resulted in respiratory failure and circulatory collapse, as well as cases of rhabdomyolysis and fulminant hepatitis. **Conclusion:** A comprehensive medical history and understanding of the signs and symptoms that may indicate Datura stramonium intoxication are necessary. Physostigmine, a type of cholinesterase inhibitor, is effective for treating severe case.

Keyword: Datura stramonium, hallucination, intoxication.

INTRODUCTION

Datura stramonium is a plant that has a hallucinogenic effect, which was discovered by Linnaeus in 1973. This plant grows in many countries with tropical and subtropical climates, including Indonesia. Datura stramonium (DS), sometimes referred to as Jimson Weed, Locoweed, Angel's Trumpet, Thorn Apple, Devil's Trumpet or Kecubung in Indonesia, is a plant characterized by white blossoms that frequently resemble a trumpet form. It is frequently

used as an alternative medicine or for the purpose of substance abuse that can induce hallucinations. It is typically found in both urban and rural environments, including roadsides, cornfields, and pastures (Tranca, et al, 2017).

The flowers of *Datura stramonium* are globally utilized for their vast range of therapeutic traits, including anti-nociceptive, anti-inflammatory, anti-spasmodic, and central nervous system (CNS) stimulating effects (Jaggernauth, 2022). Numerous alkaloids with hallucinogenic and anticholinergic properties, including as atropine, hyoscyamine, and scopolamine, are present in all parts of the plant. *Datura stramonium* has medicinal properties that make it suitable for treating respiratory system conditions including asthma and bronchitis, as well as haemorrhoids and dermatological conditions such as dermatitis, for treating dental infections and toothache, skin infections, and alopecia, as well as for decreasing abdomen colicky pain, also to reduce pain. The presence of atropine in the substance can result in anticholinergic symptoms in humans, including mydriasis, tachycardia, dry skin, flushing, and urinary retention. Additionally, when it affects the central nervous system, it can lead to delirium symptoms such as restlessness, agitation, hallucination, convulsion, coma, and even death. Delirium is a neuropsychiatric condition that is commonly observed in the emergency room (Hakkoymaz, et al, 2022).

We present a case report of a woman with *Datura stramonium* intoxication after drinking boiled water from *Datura stramonium* leaves.

METHOD

A 59 years old, female, was brought to the Emergency Room at Klungkung General Hospital with complaints of looking confused, having incoherent speech and talking to herself for 1 hour before admitted to hospital. Previously the patient was said to be normal state of health. She was said to drink 3 glasses of boiled water of *Datura stramonium* leaves to reduce the pain in her waist about 2 hours before admitted to the hospital. She appears to be hallucinating by talking to herself as if she was talking to people who are not around her. No history of previous illness was reported. On admission to Emergency Room, her vital signs were the following, blood pressure 120/70 mmHg, heart rate of 102 beats per minute, respiratory rate of 20 breath per minute, axilla temperature of 36,5^{o}C, and oxygen saturation 98% room air. She came with conscious delirium with the Glasgow Coma Scale fluctuating around 10-11 (E2-3,V3,M5). Pupil examination revealed bilateral mydriasis with a diameter of around 5mm (Figure 1).

Figure 1. Bilateral Pupil Dilatation

Her lip and skin were dry. Blood tests such as complete blood count, renal function test, liver function test, electrolytes, random blood sugar, and blood gas analysis are carried out with the results in the following table. The patient was given initial management by administering 500 cc of 0.9% NaCl in 1 hour and oxygenation. Then the patient was observed for 5 hours. After 5 hours the patient regained consciousness and evaluation in 24 hours of hospitalization, she regained consciousness, had no complaints, then the patient was discharged, and was then suggested to have a check-up at the Internal Medicine Clinic.

Table 1. Laboratory examination

Parameter	Results	Reference range
Complete Blood Count		
- Haemoglobin	12.1 g/dL	10,8 – 16,5 g/dL
- Leucocyte	6.30 x 10^3/uL	3,5 – 10 x 10^3/uL
- Thrombocyte	205 x 10^3/uL	145 – 450 x 10^3/uL
Liver Function Test		
- AST (SGOT)	17 U/L	8 – 37 U/L
- ALT (SGPT)	10 U/L	13 – 42 U/L
Renal Function Test		
- Ureum	20 mg/dL	10 – 50 mg/dL
- Creatinin	0.5 mg/dL	0,6 – 1.2 mg/dL
Electrolyte		
- Natrium (Na)	137 mmol/L	135 – 145 mmol/L
- Kalium (K)	4.5 mmol/L	3.5 – 4.5 mmol/L
- Chloride (Cl)	102 mmol/L	95 – 105 mmol/L
Random blood glucose	113 mg/dL	80 – 200 mg/dL
Blood Gas Analysis		
- pH	7,45	7,35 – 7,5
- PCO2	37,8 mmHg	35 – 45 mmHg
- PO2	154 mmHg	70 – 100 mmHg
- HCO3-	25,8 mmol/L	22 – 26 mmol/L
- BE (B)	1,4 mmol/L	(-2) – (+2)

RESULT AND DISCUSSION

Datura stramonium also known as Jimson Weed, Locoweed, Angel's Trumpet, Thorn Apple, Devil's Trumpet or Kecubung in Indonesia. This plant can reach a height of 1.5 meters in terms of morphology. The flowers of this plant have a trumpet-like form and measure between 20 and 30 cm. This plant is commonly distributed throughout Asia, as well as in the West Indies, Canada, and the United States. Datura has been used as an alternative medicinal remedy in various countries for the treatment of asthma, chronic bronchitis, flu symptoms, and pain (Mahendrakrisna, et al, 2020). *Datura stramonium* contains belladonna alkaloids, mostly atropine and scopolamine, including the roots, stems, leaves, flowers, fruits, and seeds. In addition, the flowers and leaves contain the greatest concentrations of the substance. Every Datura flower possesses 0.65 milligrams of scopolamine and 0.3 milligrams of atropine. Each Datura seed contains 0.1 milligrams of atropine. The fatal dosages of atropine and scopolamine are greater than 10 mg and greater than 2-4 mg for each atropine and scopolamine (Saputera, et al, 2022).

The main symptoms of poisoning from the *Datura stramonium* plant include increased parasympathetic symptoms such as mydriasis or dilation of the pupils caused by the suppression of the papillary sphincter muscle, dryness of the mouth due to the inhibition of salivary secretion, increased heart rate resulting from the competition for muscarinic receptors in postganglionic parasympathetic neurons, and the suppression of Sinus Atrial (SA) node receptors. The presence of dilated pupils, known as mydriasis, is a common symptom in nearly all cases of anti-cholinergic intoxication, including *Datura stramonium*. Fever and erythema may occur due to vasodilation and the inhibition of sweat glands. Additional symptoms that may occur in instances of Datura intoxication include visual hallucinations (Krenzelok, 2010). The patient in this case had tachycardia, dry skin and mucous membranes on her lips, delirium, both pupils dilated, and it looked like she was talking to someone who wasn't there.

Onset of symptoms may occur within 30-60 minutes following exposure. For the majority of patients, this condition resolves spontaneously without intervention and does not pose a risk to their lives. In severe case have resulted in respiratory failure and circulatory collapse, as well as cases of rhabdomyolysis and fulminant hepatitis (Bouziri, et al, 2011). In this patient, symptoms appeared about 1 hour after the patient consumed boiled water of *Datura stramonium* leaves. Saputera et al., reported that symptoms appeared 30 minutes after consuming *Datura stramonium* leaves in a 16-year-old male patient. In the case reported by Mahendrakrisna, et al., on 13-year-old male patient, symptoms began to appear 30 minutes after the patient consumed boiled water of *Datura stramonium* flowers.

The treatment is nearly identical to general poisoning treatments, including supportive care. The main objective is to restore balance within the autonomic nerve system. Therapeutic intervention is usually unnecessary in cases of mild anticholinergic poisoning. The initial action that must be taken is to stabilize the airway, breathing, and circulation, followed by a toxicological investigation (Krenzelok, 2010). Due to inadequate resources and infrastructure at the hospital, a toxicological examination was not conducted in this case. After 5 hours of observation and supportive treatment with normal saline infusion and oxygenation, the patient's consciousness in our case began to improve, the symptoms of hallucinations were no longer visible, the patient could already talk well, the results of laboratory tests such as complete blood count, liver function test, kidney function test, blood gas analysis, and random blood sugar showed normal results, but pupil dilation was still found in the examination.

Activated charcoal is the primary option for gastrointestinal decontamination in cases of *Datura stramonium* poisoning, as it has a strong ability to absorb toxins. Activated charcoal is recommended for the treatment of all poisonings caused by tropane alkaloids that have been consumed within the past 30 minutes to 1 hour. The administration of activated charcoal aims to restrict toxin absorption to a range of 100 - 1,000 mg per gram of activated charcoal per dosage. Oral or nasogastric/orogastric tube administration of activated charcoal is done at a dosage of 1-2 grams per kilogram of body weight. To ensure optimal decontamination outcomes, additional doses might be administered at intervals of one or two hours (Sudoyo, et al, 2014). In this case, digestive tract decontamination was not performed because the patient had passed the interval limit for administering activated charcoal, which was 2 hours.

Physostigmine is a tertiary ammonium molecule that acts as a reversible acetylcholinesterase inhibitor. It is used as a diagnostic and therapeutic drug to counteract the anticholinergic effects in both the central and peripheral nervous systems. A selective M1 receptor antagonist is the optimal treatment for anticholinergic syndrome. The suggested starting dosage is 0.5 to 2 mg administered intravenously over a period of 5 minutes, with the option of further doses if needed. This antidote is advised for individuals experiencing intense restlessness and mental disturbances, rapid or irregular heart rate with unstable cardiac function, seizures, and unconsciousness. It is important to mention that there are certain conditions that make the use of physostigmine not recommended. These include intraventricular and atrioventricular blocks, bronchospasm, intestinal obstruction, bladder obstruction, and peripheral vascular disease (Jaggernauth, et al, 2022). In this case, the patient experienced mild symptoms of datura stramonium intoxication so the patient was not given an antidote.

CONCLUSION

Datura stramonium contains belladonna alkaloids. Intoxication of this plant can lead to the manifestation of parasympathetic symptoms, and in more severe case, it may impair the functioning of the central nervous system. Establishing a reliable diagnosis of *Datura stramonium* intoxication is challenging due to limitations in toxicological investigations. Therefore, a comprehensive medical history and understanding of the signs and symptoms that may indicate *Datura stramonium* intoxication are necessary. Physostigmine, a type of cholinesterase inhibitor, is effective for treating severe case.

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