

症 例 短 報

Illicium anisatum (Japanese star anise) poisoning in an adult Japanese woman

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Introduction

Illicium anisatum (Japanese star anise) is a tree that commonly grows in Japan. It is considered religious and is placed on graves in Japan. *I. anisatum* is called “Shikimi” in Japanese, and it is morphologically similar to *I. verum* (Chinese star anise). *I. verum* is a basically non-toxic tree distributed in China. However, *I. anisatum* is toxic and contains a potent neurotoxin called anisatin¹⁾. In humans, few reports have described the effects of *I. anisatum*²⁾. Here, we report the case of a 53-year-old Japanese woman diagnosed with *I. anisatum* (Japanese star anise) poisoning.

Case Presentation

A 53-year-old Japanese woman complaining of nausea and vomiting was transferred by her private car to our emergency department. She stayed independently and was at work 1 day before admission. She had quarreled with her daughter 6 hours before hospitalization. She considered attempting suicide and went to collect *I. anisatum* growing on the hill

behind her house. She had previously known that the trees were there and recognized that *I. anisatum* is toxic on the Internet. She ingested 30 fruits of *I. anisatum* including pericarps and seeds after blending them with milk and bananas using a mixer. She vomited and was later found in an unconscious state by her daughter 2 hours before the admission. Her family brought the *I. anisatum* fruits (Fig. 1) to the hospital. The patient had a medical history of schizophrenia. Her initial vital signs were stable with a body temperature of 36.2 °C, blood pressure of 115/56 mmHg, heart rate of 65 beats per minute, respiratory rate of 24 breaths per minute, and SpO₂ of 98 % in room air. Her Glasgow Coma Scale score was E3V1M5 on admission. She had normal pupillary re-



Fig. 1 The *Illicium anisatum* (Japanese star anise) fruit consumed by the patient

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flexes but involuntary movement of the bilateral upper limbs, and her eyes were rolling upwards. The rest of her neurological examination showed unremarkable findings, as well as her physical examination. The laboratory test results were as follows : white blood cell count, 15,030/ μ L ; hemoglobin, 13.4 g/dL ; sodium, 141 mEq/L ; potassium, 3.8 mEq/L ; glucose, 145 mg/dL ; urea nitrogen, 15 mg/dL ; creatinine, 0.51 mg/dL ; aspartate aminotransferase, 21 IU/L ; alanine aminotransferase, 18 IU/L ; and serum osmolality, 292 mOsm/kg. The coagulation study revealed no abnormalities. The venous blood gas analysis results were as follows : pH, 7.38 ; HCO_3^- , 25.9 mmol/L ; PvCO_2 , 44.6 mmHg ; PvO_2 , 47.4 mmHg ; base excess, 1.0 mmol/L ; and lactate level, 2.3 mmol/L. The toxicological analyses of urine samples showed negative results confirmed with the use of Triage[®]. Head computed tomography revealed no abnormalities, and electrocardiographic monitoring showed no evidence of arrhythmias. The patient received a 50 g dose of activated charcoal orally. One hour after admission, she had a sudden generalized tonic-clonic seizure, and was treated with 5 mg of intravenous diazepam. She also received intravenous fluids. Soon, the seizure ceased, and her consciousness recovered within an hour. Her condition improved 1 day after hospitalization without treatment, and she was discharged and referred to a psychiatrist at another hospital.

Discussion

I. anisatum (Japanese star anise) is a tree of the *Magnoliaceae* family and is called “Shikimi” in Japanese¹⁾. It contains a potent neurotoxin, anisatin, which is an antagonist of γ -aminobutyric acid (GABA)¹⁾. Anisatin-induced suppression of GABA-induced current requires opening of the channels. At the single-channel level, anisatin does not alter the open time, but prolongs the time of its closure²⁾. *I. anisatum* is closely related to religion, and its leaves

are placed on graves in Japan. Fruits and seeds of *I. anisatum* are morphologically similar to those of *I. verum* (Chinese star anise). *I. verum* is basically non-toxic and widely used in spices and remedies for infantile coli. *I. verum* contaminated with *I. anisatum* has led to some cases of toxicity in infants³⁾.

Few reports have described the effects of *I. anisatum* in adults⁴⁾. Most adult patients inadvertently drink herbal tea containing *I. anisatum*⁴⁾. The major clinical findings of *I. anisatum* toxicity consist of neurological and gastrointestinal signs and symptoms³⁾⁵⁾. The former include seizure, abnormal extremity movements, and ocular nystagmus or eye rolling, and the latter include nausea, vomiting, abdominal pain, and diarrhea. The symptoms occur within 2 to 4 hours after ingestion⁶⁾. Our case developed most of the signs and symptoms described in the literature^{4)~6)}. Supportive treatment is a logical option for *I. anisatum* poisoning.

Considering that *I. anisatum* is widely distributed in Japan, emergency physicians need to know that it contains a toxin causing neurological and gastrointestinal signs and symptoms.

References

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Summary

Illicium anisatum (Japanese star anise) is a well-known tree growing in Japan. *I. anisatum* is toxic as it contains the potent neurotoxin, anisatin. Few reports have described the effects of *I. anisatum* on humans. A 53-year-old woman complaining of nausea and vomiting was admitted to our emergency department. She had ingested 30 fruits of *I. anisatum*. Her vital signs were stable, and her Glasgow Coma Scale score was E3V1M5 on admission. She exhibited involuntary movement of the bilateral upper limbs, and her

eyes were rolling upwards. Laboratory tests, head computed tomography, and electrocardiography revealed no abnormalities. One hour after admission, she had a generalized tonic-clonic seizure and was treated with intravenous diazepam successfully. She was administered intravenous fluids and oral activated charcoal. Her condition improved, and she was discharged after 1 day of hospitalization.