Remote Identification of Poisonous Plants by Cell-Phone Camera and Online Communication

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Jatropha multifida (coral plant) is an uncommon ornamental plant and an infrequent cause of poisoning. It contains curcin, a ricin-related toxalbumin [1]. Accurate and rapid identification of a poisonous plant is essential for the rational management of a poisoned patient. This is a challenging task for poison control center specialists and clinical toxicologists.

We report a case of rapid remote identification of J. *multifida* using online transmission of pictures taken with a cell-phone camera. The clinical course of the poisoning is described.

Patient Description

A healthy 12 year old girl was brought to the emergency department 7 hours after ingesting two fruits of a garden plant. One hour after ingestion she developed abdominal pain, profuse vomiting occurred and she passed loose stools. On admission she was fully conscious and oriented; her pulse was 92/minute regular, blood pressure 132/64 mmHg, respiratory rate 24/minute and temperature 36.1°C; there was epigastric tenderness but no signs of peritoneal irritation.

Laboratory evaluation yielded glucose 112 mg/dl, creatinine 0.7 mg/dl, urea 19 mg/dl, sodium 139 mEq/L, potassium 3.8 mEq/L, normal liver enzymes, hemoglobin 14.2 g/dl, white blood cells 15,560/µl and platelets 338,000/µl.

The plant was brought to the emergency department and was described on the telephone to the clinical toxicologist at the Poison Center. The toxicologist suspected *Thevetia peruviana*. The ED physician was asked to compare the plant to a Google image of *Thevetia peruviana*; as a result this diagnosis was ruled out. A cell-phone camera picture was taken and e-mailed to the Poison Center consultant who forwarded it to a botanist. The expert's diagnosis was *Jatropha multifida*. The entire identification process took less than 10 minutes.

The patient was treated supportively with intravenous fluids and an anti-emetic and recovered fully the next day. Follow-up at 4 months revealed no sequelae.

Comment

J. *multifida* belongs to the Euphorbiaceae family [1]. It is a tropical plant, cultivated as ornamental in private and public gardens in Israel. Jatropha species contains curcin, a plant lectin (toxalbumin) related to ricin [1]. Ricin is a large molecule that consists of two polypeptide chains (A and B) connected by disulfide bonds. The B chain binds to the terminal galactose of cell surface glycolipids and glycoproteins and the bound toxin undergoes endocytosis. Inside the cell, the toxin is transported via endosomes to the Golgi apparatus and the endoplasmic reticulum. The A chain is then translocated to the cytosol where it stops protein synthesis by inhibiting the 28S subunit of the 60S ribosome. The ultimate result is widespread cytotoxicity that can be severe and even fatal [2].

Ricin ingestion generally causes vomiting, diarrhea and dehydration as well as cardiac, hematological, hepatic and renal toxicity [2]. The clinical manifestations of J. *multifida* poisoning are rapid onset of abdominal pain, profuse vomiting and diarrhea. Miosis and mild elevation of liver enzymes have also been reported [3,4]. *Jatropha curcas* (another curcin-containing species) was reported to cause similar poisoning, including shock in humans and even death in mice [5]. It has also been used as a folk remedy.

Treatment consists of timely gastrointestinal decontamination and supportive measures. In our patient gastrointestinal decontamination was not applied due to late presentation and profuse vomiting. The patient was treated with intravenous fluids and anti-emetics and recovered completely.

In this case, the initial presumptive diagnosis of *Thevetia peruviana* (a cardiac glycoside-containing plant) was made by verbal description. Correct identification was crucial as *Thevetia peruviana* poisoning can cause severe cardiac toxicity and hyperkalemia and may require specific antidotal therapy with digoxin Fab-fragment antibodies. Online transmission of the picture using a cell-phone camera and computer communication enabled correct and rapid identification of the culprit in this case. Prompt and reliable identification of uncommon plants can dictate appropriate treatment and save unnecessary diagnostic and therapeutic procedures.

In conclusion, J. *multifida*, a toxalbumin-containing plant, is an uncommon cause of poisoning. Not seeing the offending agent and relying on a verbal description are major limitations of poison center work. Online transmission of pictures to the poison center, and if needed to botanical or zoological experts,

ED = emergency department

is a simple rapid identification tool that can markedly contribute to the rational care of poisoned patients.

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