A 87-year-old woman suffering from advanced dementia was admitted on May 1, 2010, for an accidental ingestion of 2 sprigs of lily of the valley offered to her by her family. She arrived 2 hours after ingestion to the emergency department with digestive disorders (nausea and an episode of vomiting). An initial clinical examination found a blood pressure of 155/85 mm Hg, a heart rate of 45 bpm, and a normal cardiovascular examination. The initial ECG showed sinus bradycardia at 45 bpm and repolarization disorders in the anterior and lateral derivations (Figure 1A). Her kalemia was 4.4 mmol/L, plasma creatinine was 66 μmol/L, and troponin was <0.06 μg/L. Her digoxin serum concentration was in the therapeutic range. The patient was hospitalized in the intensive care unit with continuous ECG and hemodynamic monitoring. Three hours later, her heart rate and blood pressure were normalized at 70 bpm and 124/64 mm Hg, respectively, without any drugs. Digestive disorders were improved with simple symptomatic treatment (antiemetic). The ECG showed sinus rhythm at 70 bpm with persistent negative T waves in the anterior and lateral derivations (Figure 1B). The next day, the patient was discharged from the hospital after 24 hours of monitoring with no recurrence of digestive and cardiovascular disorders.

Lily of the valley, or Convallaria majalis (Figure 2), takes its origin from convallis (valley), leiron (lily), and majalis (May). It is a perennial herb 10 to 30 cm high with only 2 green, elongated leaves. White, bell-shaped flowers are borne by a single pole from April through June. Red berries containing seeds replace the flowers from July through October. Lily of the valley grows throughout Europe, North America, and Asia. On the May 1, the tradition is to offer people lily of the valley, considered to be a lucky charm that brings luck and joy until the next year.

The short period of possible exposure probably explains why cases of human poisoning are rare. These cases usually concern young children who chew the stems or leaves, eat a small bay, or drink out of a water tank.

The whole plant is toxic and contains irritating substances: saponins, responsible for digestive disorders, and cardiac glycosides (nearly 20 glycosides). The principal component of glycosides is convallatoxin, which is responsible for cardiovascular disorders because of its digitalis-like effect. Manifestations of this poisoning are similar to those seen in digitalis intoxication in the elderly: digestive disorders, bradycardia, high blood pressure, and arrhythmias. The mechanisms underlying the toxicity are identical to those of digitalis, acting primarily on the inhibition of Na-K ATPase membrane and the elevation of intracellular calcium. For these reasons, lily of the valley was once used to treat heart failure. However, the therapeutic window was small and toxicity was frequently encountered, so this use was abandoned.

The severity of poisoning depends on the amount ingested, which may be difficult to assess, especially in children or, as in this case, in an elderly person with dementia. In France, poison control centers consider that the poisoning from 5 bays or 2 leaves and stems is severe, and potentially fatal. Most often, the quantities ingested are below toxic levels, and the individual requires simple home monitoring. Ingestion of large amounts of the plant requires hospitalization with continuous hemodynamic monitoring for at least 24 hours, an assay of digoxin serum concentration, and control of kalemia. A gastric decontamination with activated charcoal should be considered if the patient has not already vomited. Management of digestive disorders is usually based on simple symptomatic treatments. Cardiovascular disorders require a specific management (such as atropine, cardiac pacing, and antiarrhythmic drugs). To bind cardiac glycosides and to reduce active concentrations, the use of digoxin-specific antibody fragments has been proposed in many publications of severe glycoside poisoning. Indications were the same as in digitalis intoxication. In our case, because of the lack of criteria indicating severity, such treatment was not considered.

Disclosures

None.

References

Figure 1. A, Initial ECG showing sinus bradycardia at 45 bpm with a PR interval of 125 milliseconds, a calculated QTc of 435 milliseconds, and negative T waves in the anterior and lateral derivations. B, ECG 24 hours later showing sinus rhythm at 70 bpm with persistent negative T waves in the anterior and lateral derivations, a PR interval of 145 milliseconds, a calculated QTc of 440 milliseconds, and 1 ventricular extrasystole.
Figure 2. Lily of the valley (*Convallaria majalis*).
Digitalis Intoxication Induced by an Acute Accidental Poisoning by Lily of the Valley
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