

Toxic Tea - Case Report

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A young gentleman presents with deliberate unidentified plant ingestion, complaining of abdominal pain and vomiting. He is found to have junctional rhythm at 37 beats per minute. On further questioning, he is noted to have ingested *Nerium oleander* leaf tea extract as part of a ritual. The mechanism of action, diagnosis and management of oleander poisoning is discussed in this case report. Awareness to the common oleander plant and its toxicity in the Maltese islands and around the Mediterranean is emphasized.

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INTRODUCTION

Cardiac glycosides are a group of chemicals naturally occurring in several subtropical plants. They can be found in many plant genera such as *Digitalis*, *Nerium*, *Crochorus* and *Rhodea*.¹ The best known of these plants is the Foxglove plant (*Digitalis*) from which the commonly used drug digoxin is produced. Cardiac glycosides act by inhibition of the sodium-potassium ATPase pump in myocardial cells.² This is used as treatment for various cardiac conditions but in excess it has toxic effects.

The oleander plant (*Nerium oleander* and *Thevetia peruviana*) is a common evergreen shrub with long, pointed leathery leaves. It blooms between April-October, portraying bright pink or yellow flowers (species-dependent) and is commonly found around field margins, valley-sides and damp shrublands. It is native to central and east Mediterranean. In suitable habitats, it can grow up to 3.5 meters. In the Maltese islands its popularity grew dramatically in the 1970s and 80s with large populations of oleander being found all over the islands.

Oleander poisoning may occur on minimal ingestion of any part of the tree, including leaves, flowers, stems, twigs, and roots.³ Its bright-coloured flowers give rise to numerous accidental poisonings. Whilst most accidental poisonings do not give rise to toxic effects, deliberate ingestion of significant quantities, such as in folk medicine practice, cultural rituals, homicides, and suicide, often lead to serious toxicity.

Toxic effects result from cardiac glycosides found in all parts of the plant. As cardiac glycosides are not disrupted by heat, plant smoke from burning can also lead to toxicity. Reports of deaths after eating cooked food over oleander wood fires have been reported.¹ Commonest effects from oleander poisoning include cardiac, gastrointestinal, and metabolic effects, with the former taking up to 12 hours to fully develop.³

Below we present a case report of deliberate oleander ingestion.

CASE PRESENTATION

A 23-year-old gentleman was brought to the Emergency Department (ED), in view of multiple episodes of vomiting, abdominal pain and feeling generally unwell. Symptoms began 14 hours after ingestion of self-prepared "olive leaf" tea (100mL). This was ingested to relieve the generalised pain caused by construction work, as part of a ritual.

On assessment, the patient was alert but pale, lethargic and diaphoretic. Chest examination revealed normal vesicular breath sounds and normal percussion notes. The patient had a blood pressure of 101/60mmHg, with a heart rate of 37bpm. Other parameters were within normal limits. ECG revealed a junctional rhythm at 37bpm (Figure 2).

The patient was treated with atropine (0.5mg iv), with almost-immediate resolution of the bradycardia. His heart rate increased to 97bpm within seconds, with recurrence of bradycardia after 30 minutes. This was followed by another atropine administration, with the same outcome.

The clinical toxicologist on-call was contacted in view of possible oleander poisoning and suggested a serum digoxin level, which revealed a digoxin level of 0.8 ng/mL [0.6-1.2 ng/mL], with all other routine blood tests being within normal limits.

Images of olive leaves and oleander leaves were shown to the patient and the patient identified the oleander leaves as the 'olive leaves'. It thus came to light that he had not ingested olive leaf tea but an oleander extract. Treatment with 5 vials (200mg) of digoxin-specific antibody (DigiFab) was initiated. The patient was concomitantly resuscitated with intravenous fluids and intravenous anti-emetics. No further episodes of bradyarrhythmias occurred post DigiFab in the ED.

He was subsequently admitted to hospital and had an uneventful recovery.



Figure 1 Oleander photo

DISCUSSION

Mechanism Of Action

Oleandrin is the main toxin found in the oleander plant. As a cardiac glycoside, oleandrin affects multiple essential cell processes, the most common being inhibition of the sodium-potassium ATPase pump, which in turn has an effect on other transport proteins, including the sodium-calcium exchanger found in cardiac myocytes.² This may lead to cardiac arrhythmias. Oleandrin also increases vagal activity of the heart and exhibits a negative chronotropic and dromotropic effect by acting on the SA and AV nodes respectively. Gastrointestinal effects include nausea and vomiting, cramping and bloody diarrhea. Central nervous system symptoms range from mydriasis, visual disturbance, dizziness, and confusion.⁴ Metabolic effects include hyperkalemia (associated with poorer prognosis) and metabolic acidosis.⁴⁻⁵

Diagnosis And Management

Diagnosis of oleander poisoning will depend on the identification of Nerium oleander ingestion, symptoms and signs exhibited (nausea, vomiting, abdominal pain, lethargy and bradycardia, anorexia, delirium and visual changes) and hyperkalemia.

Management involves general supportive care as well as specific treatment for cardiac glycoside toxicity. Supportive care includes haemodynamic support of bradycardia with atropine administration and arrhythmia management according to latest guidelines, which may include temporary venous pacemaker and cardioversion (chemical or electrical).

The antidote for cardiac glycoside poisoning is digoxin-specific antibody (Fab) fragments, commercially available as DigiFab, notably when signs of instability are present.⁷⁻⁸ DigiFab rapidly reverses the effect of cardiac glycosides. Non-digoxin glycosides (such as oleander) may cross-react with antibodies found in most radioimmunoassay kits and result in digoxin being reported as present. While a measurable digoxin concentration may confirm

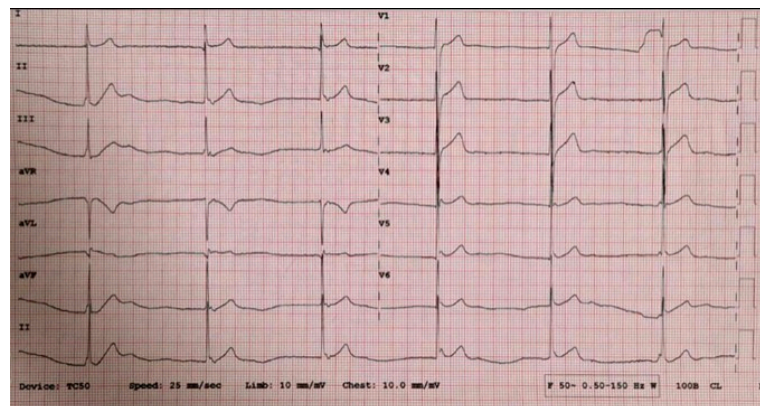


Figure 2 ECG

exposure, the qualitative concentration cannot be used to guide therapy.⁶

Higher doses of DigiFab are used in oleandrin poisoning when compared to digoxin toxicity as DigiFab is less specific to oleandrin.⁹ Cardiac glycosides are well absorbed by charcoal; administration of charcoal should be considered in all cases that present within 1 to 2 hours post ingestion. Emesis is not recommended for cardiac glycoside ingestion.

CONCLUSION

Oleander is a common plant around the Mediterranean and other places in the world, and its availability should alert emergency physicians to consider it as a potential poison in toxicology cases where ingestion of a plant is likely. Whilst our case did not lead to fatality, multiple reports of fatal ingestion have been reported. Awareness, early recognition, and management should reduce mortality and morbidity.

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