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Case Report

Nerium Oleander Poisoning Without Increased Glycoside Levels and Simultaneous SA and AV Blocks: A Case Report

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ABSTRACT

Background: Many plants, including Nerium oleander, contain cardiac glycosides. The cardiac glycosides in Nerium oleander have more digestive effects than digoxin, with symptoms ranging from nausea and vomiting to muscle cramps and bloody diarrhea. The common oleander plant (Nerium oleander) is poisonous and potentially lethal. All parts of it, including the root, stem, and leaves, contain various digoxin-like cardiac glycosides.

Case Presentation: A 34-year-old woman from Boshruyeh complained of headache, lightheadedness, nausea, and abdominal pain approximately 5 hours after consuming an unknown amount of Nerium oleander leaves in the form of a decoction. We studied a case report of common oleander poisoning, which presented with clinical manifestations of headache, lightheadedness, nausea, and abdominal pain. The patient had bradycardia and some degree of heart block and was discharged after 3 days in good general condition following treatment with atropine injection and other supportive measures.

Conclusions: Although both Nerium oleander and digoxin are glycosides, Nerium oleander does not raise digoxin levels. Like digoxin, which affects the AV and SA nodes, this plant causes negative inotropic and blocking effects in the SA and AV nodes, leading to bradycardia. ***(Iranian Heart Journal 2024; 25(4): 96-99)***

KEYWORDS: Nerium Oleander, Poisoning, Glycoside level, SA block, AV block

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The common oleander plant (Nerium oleander) is a poisonous and potentially lethal plant. All parts of it, including the root, stem, and leaves, contain a variety of digoxin-like cardiac glycosides. These cardiac glycosides include oleandrin, folineriin, adynerin, and digitoxigenin.

Poisoning with this plant is more common in tropical and subtropical regions, and its use as a method of self-harm is a common toxicology emergency in South Asian countries, especially India and Sri Lanka. Depending on the case and the amount consumed, eating this plant can cause symptoms such as nausea, vomiting, abdominal pain, diarrhea, heart dysrhythmia, and hyperkalemia. Its management and treatment include supportive and symptomatic care, the use of activated charcoal in the early hours to interrupt the enterohepatic and enterovascular cycles, and, if necessary and available, the use of digoxin-specific Fab fragments. [1] While our case

exhibited common symptoms of digoxin poisoning, it also presented with a series of uncommon and rare symptoms, such as sinoatrial (SA) block and elevated digoxin levels in tests.

Case Report

A 34-year-old woman from Boshruyeh complained of headache, lightheadedness, nausea, and abdominal pain approximately 5 hours after consuming an unknown amount of Nerium oleander leaves in the form of a decoction. She had taken it intending to use the plant's sedative and sleep-inducing properties. In Boshruyeh, after initial investigations and noting the bradycardia and heart block evident in the ECG, she was consulted by the cardiology service and then sent to Razi Hospital in Birjand. The patient was a non-smoker and non-alcoholic. She had a history of depression and depressive disorders for about 7 years. She did not take medication and was alert during the initial assessment. Her blood pressure was 99/50 mm Hg, and she had an irregular heartbeat in the range of 50 bpm. She appeared toxic due to abdominal pain and nausea. Heart and lung auscultation were normal.

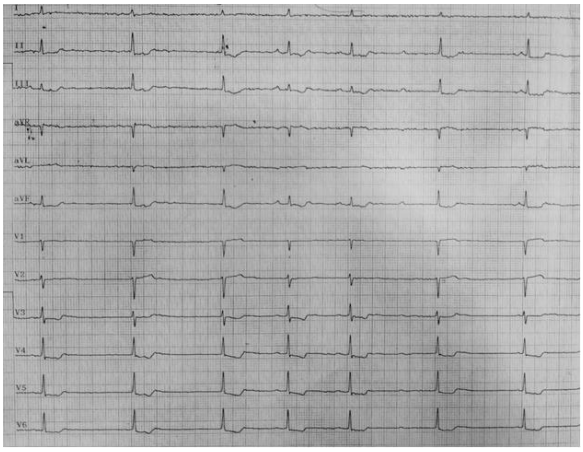

Figure 1: The ECG taken in Boshruyeh shows bradycardia. Determining the type of the heart block was challenging due to the coincidence with the possible block of the sinoatrial node. The effect of digitalis is seen in precordial leads V_3–V_6.

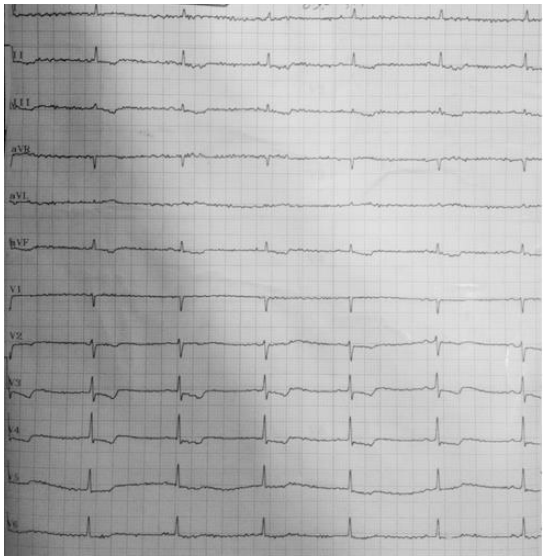

Figure 2: This is the patient's ECG taken upon arrival at the hospital.

The patient received 1 mg (2 ampoules) of atropine as a bolus, 1 ampoule of ondansetron (4 mg), and 1 ampoule of pantoprazole (40 mg) in Boshruyeh. In Birjand, she underwent heart monitoring, and atropine was prescribed if her heart rate fell below 40 bpm. Electrolytes, including sodium, potassium, magnesium, calcium, and phosphorus, were measured, as electrolyte disorders, especially hyperkalemia and hypermagnesemia, occur in this type of poisoning and can predispose a person to arrhythmia. Measurement of potassium and magnesium twice a day was ordered for this patient.

The patient underwent echocardiography on the first day of hospitalization, and all parameters were reported to be normal. Additionally, the digoxin level was checked and reported as 0.72 ng/mL, which is below both the toxic and therapeutic levels of digoxin. After serum therapy and cardiac monitoring in Birjand, and without the need for atropine, the patient's general condition had improved by the second day of hospitalization. Her headache, dizziness, and nausea had disappeared, and she only complained of diarrhea. However, her bradycardia persisted, with a heart rate in the range of 45 bpm. The patient was discharged

after 3 days of hospitalization with the resolution of bradycardia and the resolution of general symptoms.

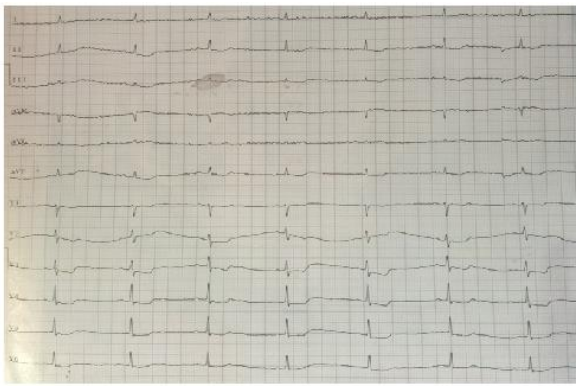

Figure 3: The image presents the patient's ECG on the morning of her first day of hospitalization.

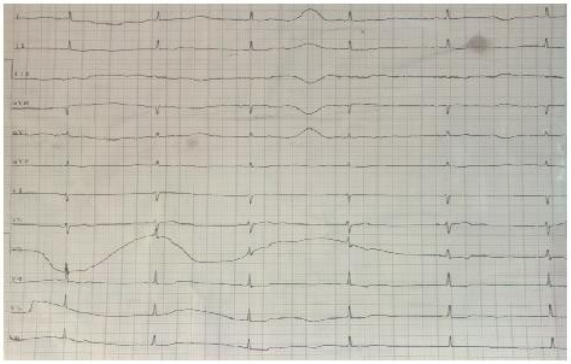

Figure 4: The image presents the patient's ECG on the morning of her second day of hospitalization.

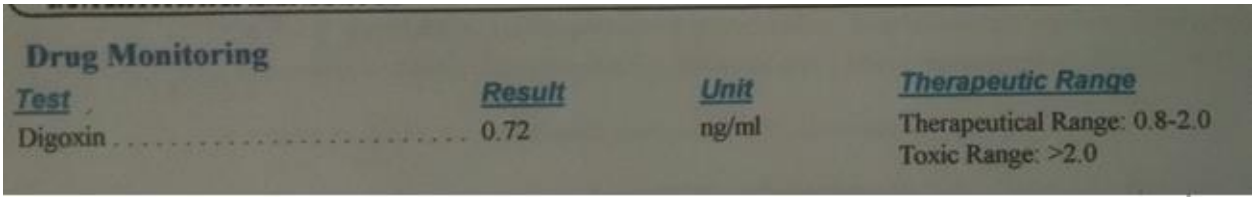

Figure 5: The image presents the patient's digoxin level in the tests.

DISCUSSION

Many plants, including Nerium oleander, contain cardiac glycosides. The cardiac glycosides in Nerium oleander have more digestive effects than digoxin, with symptoms ranging from nausea and vomiting to muscle cramps and bloody diarrhea. Confusion, dizziness, drowsiness, weakness, visual disturbances, and mydriasis are manifestations of central nervous system toxicity. The most serious side effects of Nerium oleander poisoning are cardiac abnormalities, including various ventricular rhythm disorders, tachycardia, bradycardia, and heart block. ECG often shows a lengthening of the PR interval, a shortening of the QRS-T interval, and flattening or inversion of the T wave. It is assumed that these clinical manifestations result from both increased vagotonia and direct cardiac glycoside toxicity. In our case, her poisoning was generally considered moderate, as similar cases in other studies had a high mortality risk. [2, 3]

Our patient's glycoside level did not increase in the tests, which seems to indicate a difference between the type of glycoside in this plant and common glycosides. Nonetheless, she showed symptoms of headache, nausea, abdominal pain, and dizziness, which were consistent with other studies. Treatment of Nerium oleander poisoning is empirically based on the treatment of digitalis-glycoside toxicity and includes hemodynamic support for the patient. This may involve administering atropine for severe bradycardia, using phenytoin or lidocaine hydrochloride to control dysrhythmias, and employing a temporary venous pacemaker. [4] In our case, we used drug therapy (atropine) and hemodynamic support.

Sinus bradycardia is the most common associated arrhythmia. With Nerium oleander poisoning, junctional rhythm, first-degree heart block, and ventricular ectopy are often observed in patients during hospitalization. The incidence of ventricular tachycardia and ventricular fibrillation has been reported to be about 0.8-14% and 0.4-4%, respectively. Management of a wide variety of cardiac arrhythmias is often straightforward because the patients are young and free of cardiac complications. In 3% of cases, temporary intravenous pacing was needed. In the examination of the patient, we also observed bradycardia and degrees of atrioventricular (AV) and SA block. Due to their simultaneity, it was possible to accurately diagnose the type of AV block. The important aspect in this case was the presence of SA and AV blocks in our patient. Similar to digitalis poisoning, which blocks the AV and SA nodes, Nerium oleander also blocks the SA and AV nodes. [5]

CONCLUSIONS

Digoxin-like cardiac glycosides, such as oleandrin, are present in Nerium oleander. Like digoxin, oleandrin affects the AV and SA nodes, causing negative inotropic effects and blocking action in the SA and AV nodes, which can lead to bradycardia. This condition can result in life-threatening situations; however, with an accurate diagnosis, a detailed patient history, and the patient's cooperation, it is possible to respond quickly and effectively in cases of this uncommon type of poisoning.

Declarations

Funding: There was no funding for this manuscript.

Conflict of Interest: There were no conflicts of interest concerning this manuscript.

Ethical Approval: Not applicable.
Written informed consent for the publication of this case report was obtained from the patient.

Availability of Data and Materials: The data presented in this case report are available upon reasonable request.

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