



A Study On Clinical Outcome And Electrocardiographic Aspects Of Yellow Oleander Seed Poisoning

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Abstract

Background: Yellow oleander *Cascabela thevetia*, a plant of the tropics is a customary way adapted for self-slaughtering. It is fused with cardiac glycosides which affects the heart muscles. Blockage of the sodium/potassium ATPase pump on the cardiac myocyte cellular membrane is the machinery of action of cardiac glycosides. Cardiac glycosides source a reflective intensification in central sympathomimetic activity on heart which leads to arrhythmias.

Methods: Changes in cardiac rhythms presented in patients who had taken yellow oleander seeds (n=50) is determined by electrocardiogram and laboratory investigation of serum potassium was done.

Results: The mean age was 39.3 years. Around 72% victims had ECG changes. There was male preponderance in the study and 56% had ECG changes. The predominant ECG changes noted was sinus bradycardia. In 18% of the presented cases serum potassium levels were raised. There were no deaths in the study.

Conclusion: Serum potassium quantities were raised up in cases with electrocardiographic manifestations. Victims who had ECG changes had long ICU and hospital stay. Patients who gained access to the hospital promptly had slighter baneful effects than who were presented behind time. Though emergency care was given at home it doesn't help any cardiac toxicity. There was no fatality in the study, all victims had regular ECG on leaving the hospital.

Keywords: Yellow oleander, cardiac glycosides, electrocardiogram, self-slaughtering, bradycardia, arrhythmias

Introduction

The customary way adapted for intentional physical harm (suicidal attempts) is poisoning. Poison is elucidated as the material which has the ability to root destruction to living beings by various biochemical reactions or molecular action.

Oleander is a shrub grown in all parts of India, is as a whole a poisonous plant. Pink oleander (*Nerium oleander*) and yellow oleander (*Cascabela thevetia*) are the two types of oleander plants. Yellow oleander (*Cascabela thevetia*) is commonly grown-up for its glowing nature. This is a plant of the tropical regions. The plant is incorporated with cardiac

glycosides that affects heart muscles similar to digoxin. Each and every part of yellow oleander is toxic to living beings. Nuts are triangular shaped with a deep groove, which has two seeds. Seeds are pale yellow and much hard like stone, with a covering shell and rich in glycosides.¹ They also show effects on cardiac myocytes which leads to elevated force and rapid contraction of heart muscles. Cardiac glycosides present in yellow oleander seeds cause cardiac manifestations.^{2,3} Noxious dosage of seeds are 8-10 seeds. The dangerous indicators of oleander seed incorporation are driven by unpredictability in virulence absorption of seeds, crinkled or non-

mashed seeds, inconsistency in assimilation from the intestine and relational modifications in the cardiovascular reaction. Various studies have reported Bradyarrhythmia's, to be more customary among cardiac dysrhythmias. Every part of the plant is fatal in the order seed >leaves>fruit. The fruit of yellow oleander is plump and wedge-shaped.⁴ Its tint differs from greenish in the initiation to golden and lastly into dusky black.Hinderance of sodium /potassium ATPase pump on the cardiovascular myocardium is the machinery of action of cardiac glycosides. This results in a intracellular hypernatremia. Sodium /calcium exchange channel is disturbed by the high intracellular sodium concentration and intracellular hypercalcemia ensues amplified force of contraction. Through discharge of mediators like histamine, nitric oxide and leukotrienes - cardiac glycosides can generate cardiotoxic effects ³.When the Na+/K+ pump is repressed it marks hyperkalaemia ⁵. Hyperkalaemia is a sign of severe acute oleander poisoning. Cardiac glycosides source a reflective intensification in fundamental sympathomimetic action on heart which give rise to arrhythmias.⁶

Materials And Methods

This was an organised study conducted on 50 cases hospitalized in Government Thiruvarur Medical College and Hospital, Thiruvarur in the course between February 2022 to August 2022, who were above 15 years of age to learn the electrocardiographic changes in yellow oleander seed poisoning.Cases who had synchronized cardiovascular affliction, patients who were ingesting cardiac pills, patients who used up herbal parts other than seed, patients who were affected with dyselectrolytemias, paediatric patients and patients

who were reluctant to join in the study were eliminated.Individual essentials like age, sex and socio-demographic details were gathered. Medical particulars concerning the toxic condition for instance the shade of the seed, quantity of seed, form of eating was investigated and noted. Period break amid exterminating and hospitalization, details of emergency assistance was acquired. Medical indications suffered by the patients were taken down. Inspection was completed in a comprehensive method and vital signs were verified and system check-up was carried out. ECG was obtained in all cases after admission. Repetitive conservative limb, leads, chest leads and long strips were recorded. Electrocardiography and lab investigations including random blood sugar, Blood urea, Serum creatinine, Serum potassium, Serum sodium and Urine routine were checked in all the casesAll cases were hospitalised and firstly processed with gastric lavage with normal saline. IV fluids and steroids were administered. In case of sinus bradycardia, orciprenaline was provided until bradycardia was fixed. In case of critical bradycardia with pulse <40 the patients were maintained in intensive care unit and handled with lesser doses of atropine. Pace maker amenities as well as digoxin specific antibodies are not obtainable in our hospital.

Statistical Analysis:

Descriptive statistical analysis for constant dimensions was disclosed on mean ± standard deviation (SD). Results on categorical measurements was represented in number (%). The Chi-Square test was used for comparability the categorical variables. Two-sided p-value of <0.05 was accepted for statistical implication.

Results:

Table 1: age distribution

Age group	N	%
</=20	5	10.0
21-40	24	48.0
>40	21	42.0
Total	50	100.0
Mean+/-SD (Range)	39.3+/-15.5 (13-75)	

Table 2: distribution based on number of seeds consumed

Quantity of seed consumed	N	%
2	6	12.0
3	6	12.0
4	9	18.0
5	9	18.0
6	5	10.0
7	7	14.0
8	3	6.0
9	1	2.0
10	2	4.0
12	1	2.0
15	1	2.0
Total	50	100.0
Mean+/-SD (Range)	5.4+/-2.7 (2-15)	

Table 3: distribution of time interval of presentation

Time interval between consumption and admission	N	%
<6 hours	41	82.0
>/=6 hours	9	18.0
Total	50	100.0
Mean+/-SD (Range)	3.5+/-3.9 (1-21)	

Table 4: distribution based on ECG changes

ECG changes	N	%
Present	36	72.0
Absent	14	28.0
Total	50	100.0

Table 5: various ECG changes seen

ECG changes	N	%
Sinus bradycardia	20	40.0
Sinus tachycardia	5	10.0
First degree AV block	3	6.0

Second degree t1 AV block	1	2.0
2:1 AV block	1	2.0
Complete AV dissociation	2	4.0
Junctional rhythm	1	2.0
Ventricular bigemini	1	2.0
Ventricular premature complexes	1	2.0
Atrial ectopics	1	2.0
Sinus rhythm	14	28.0
Total	50	100.0

Table 6: distribution based on outcome

Outcome	N	%
Discharged	48	96.0
Referred	2	4.0
Total	50	100.0

Table 7: distribution based on the duration of hospital stay

Duration of hospital stay	N	%
</=5 days	41	82.0
>5 days	9	18.0
Total	50	100.0
Mean+/-SD (Range)	3.98+/-1.6 (2-8)	

Table 8: comparison between age and ECG changes

Age group	ECG changes				Chisquare test
	Present		Absent		
	N	%	N	%	P value
</=20	5	100.0%	0	0.0%	0.319
21-40	16	66.7%	8	33.3%	
>40	15	71.4%	6	28.6%	
Total	36	72.0%	14	28.0%	

Table 9: comparison between gender and ECG changes

Gender	ECG changes	Chisquare
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	Present		Absent		test P value
	N	%	N	%	
Male	19	70.4%	8	29.6%	0.781
Female	17	73.9%	6	26.1%	
Total	36	72.0%	14	28.0%	

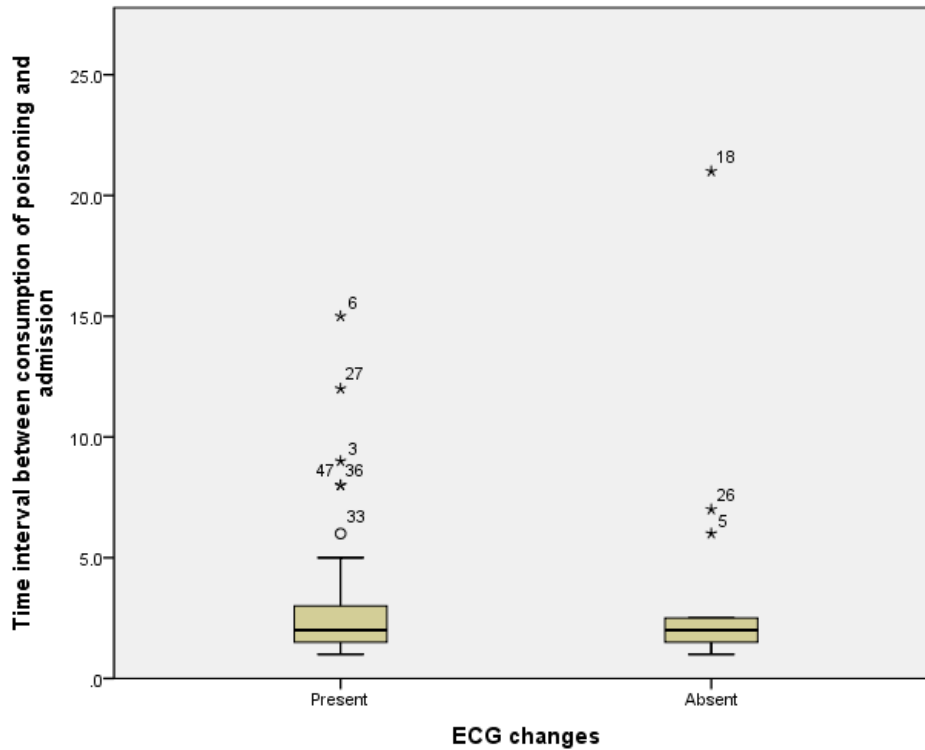


Table 10: comparison between ECG changes and duration of presentation

Time interval between consumption and admission	ECG changes				Fisher exact test P value
	Present		Absent		
	N	%	N	%	
<6 hours	30	73.2%	11	26.8%	0.697
>/=6 hours	6	66.7%	3	33.3%	
Total	36	72.0%	14	28.0%	

Table 11: serum potassium and ECG changes

Variables	ECG changes	N	Mean	SD	Unpaired t test P value
Serum Potassium	Present	36	5.128	.9276	0.007
	Absent	14	4.364	.6778	

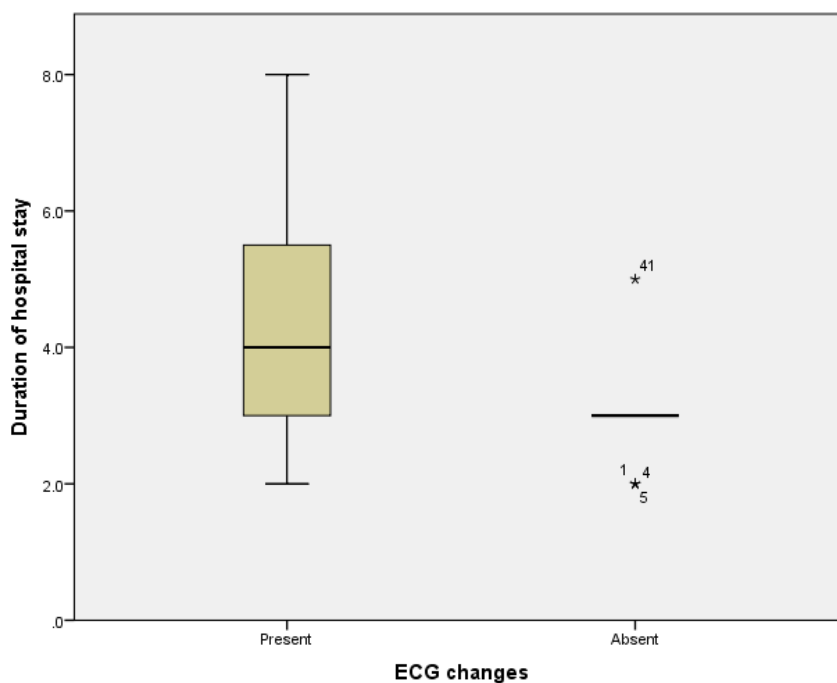


Table 12: comparison between duration of hospital stay and ECG changes

Variables	ECG changes	N	Mean	SD	Unpaired t test P value
Duration of hospital stay	Present	36	4.389	1.6950	0.003
	Absent	14	2.929	.7300	

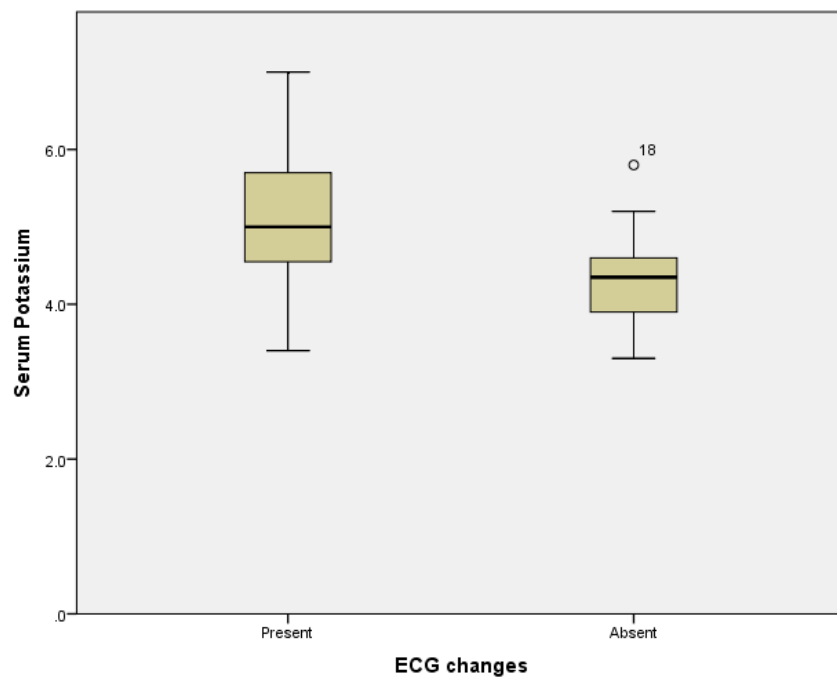
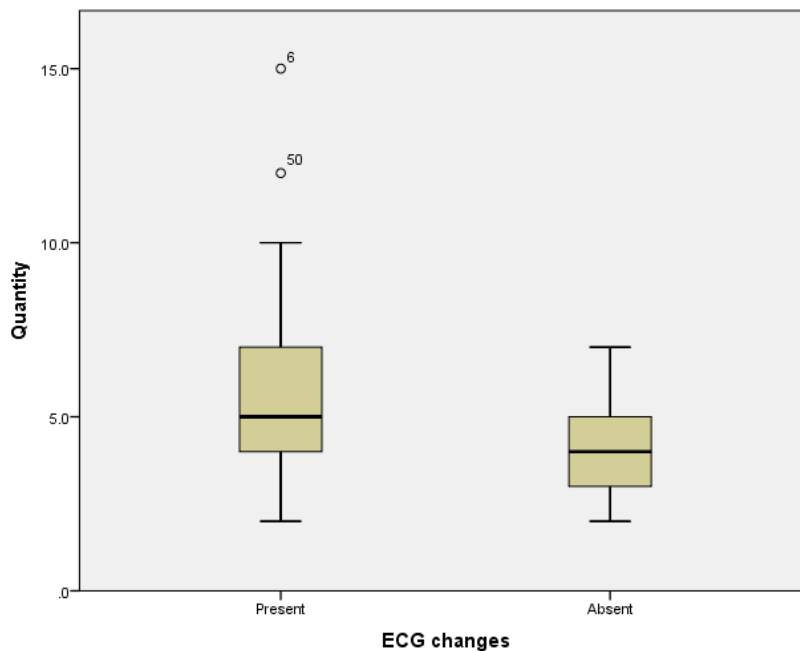


Table 13: comparison between duration of hospital stay and ECG changes

Duration of hospital stay	ECG changes				Fisher exact test P value
	Present		Absent		
	N	%	N	%	
≤5 days	27	65.9%	14	34.1%	0.047
>5 days	9	100.0%	0	0.0%	
Total	36	72.0%	14	28.0%	

Table 14: comparison between number of seeds and ECG changes

Variables	ECG changes	N	Mean	SD	Unpaired t test P value
Quantity of seeds	Present	36	5.778	2.9190	0.112
	Absent	14	4.429	1.6968	



Discussion:

Around 72% cases who ingested seeds had ECG changes in the current study of Oleander seed poisoning. In males ECG changes were perceived in about 73% and among the females ECG changes were about 74%. Mostly victims were in the compeers of 21-40 years followed/ by >40 years with insignificant male predominance. The findings in our study echoes Fonseka et al⁶ from Sri Lanka who has published their series in 2002.^{7,8} The consequences of

our study were analogous with mean age of 27.9±9.06 years. The connection amongst cardio toxicity and the serum biomarker potassium was premeditated in the study. The serum K⁺ levels were significantly elevated in patients who had ECG changes. Cardiac glycosides hinder sodium/potassium ATPase pump which effects in enlarged intracellular sodium and calcium.⁹The obstruction of sodium/potassium ATPase pump leads to the hyperkalaemia, and in conjunction with the

intracellular hypercalcemia, it precipitates the arrhythmias. The rhythm disturbances differ from unpretentious bradycardia to multifaceted bradyarrhythmia. Patients had extensive hospital stay and ICU stay who established cardiac manifestations. Though emergency treatment was given at household it does not stand any association to the toxic cardiovascular indications.¹⁰ Fatality was absent in our study. ECG was standard for all patients during discharge. In the near future, improved medical handlings are instantly required to boot out the burden of oleander poisoning on the medical services and to diminish the case mortality (Eddleston 1997).

Conclusion

Cascabela thevetia (yellow oleander) seed poisoning is the utmost communal type of self-slaughtering. In the existing study majority population were males indicating male dominance and intoxication was common amongst age range between 21-40 years. 72 % of victims had ECG abnormalities. The most common electrocardiographic deviation detected was sinus rhythm and sinus bradycardia were about 28% and 40% respectively. There were no expiries in the current study. Serum K⁺ levels were elevated in patients with ECG manifestations. Victims who had ECG changes had long ICU and hospital stay. Though first aid was given it doesn't help any cardiac toxicity. As there was no loss in our study, all victims had standard ECG on discharge. In near future better medical treatments are required to reduce fatality.

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