



ISSN: 0976-3031

Available Online at <http://www.recentscientific.com>

CODEN: IJRSFP (USA)

International Journal of Recent Scientific Research
Vol. 9, Issue, 4(D), pp. 25808-25811, April, 2018

**International Journal of
Recent Scientific
Research**

DOI: 10.24327/IJRSR

Research Article

CLINICAL PROFILE OF PLANT POISONING IN A TERTIARY CARE CENTRE IN KERALA

Ramya Das NK¹, *Jayachandran NV² and Shajit Sadanand³

¹Department of Medicine, Govt. Medical College, Thrissur

^{2,3}Department of Medicine, Govt. Medical College, Calicut

DOI: <http://dx.doi.org/10.24327/ijrsr.2018.0904.1935>

ARTICLE INFO

Article History:

Received 8th January, 2018
Received in revised form 21st
February, 2018
Accepted 05th March, 2018
Published online 28th April, 2018

Key Words:

Plant poisoning, Oduku, Yellow oleander, *Abrus precatorius*

ABSTRACT

Plant poisoning is a major cause for morbidity and mortality especially in the developing world like India and mainly involves young productive individuals. An in-depth knowledge into the manifestations of plant poisoning and the danger signs would help in predicting the adverse risk factors and lead to better outcome in such patients. There are only very few studies on clinical profile of plant poisoning from south India. Hence we took up the study to determine the effects of plant poisoning admitted to a tertiary care referral hospital over a period of one year. 143 cases of plant poisoning were admitted during this period. Most of them consumed Oduku (53.15%) followed by Yellow oleander (39.86%) and *Abrus precatorius* (6.99%). Mean age of the population was 31.09 with a standard deviation of 14.87. Male to female ratio was almost equal. Common presenting symptoms were nausea and vomiting. Hypokalemia is one of the common manifestations of Oduku poisoning which had previously been described as a poor prognostic sign in various studies. Most common ECG finding noted was ST-T changes, which was found to be a poor prognostic factor. Mortality rate of Oduku poisoning was 2.63%. Most of the patients had normal ECG, sinus bradycardia was present in 9 (6.36%) patients, 3 patients (5.45%) had first degree heart block and second degree heart block in one patient (1.82%). None of them had complete heart block or QT prolongation. Hyperkalemia was observed in 6 patients (10.90%) on admission, 5 patients (9.09%) after 24 hours, and one patient (1.85%) after 48 hours. Mortality rate found in our study was 3.6%. Patients admitted with consumption of *Abrus precatorius* didn't show significant electrolyte disturbance or ECG changes.

Copyright © Ramya Das NK., Jayachandran NV and Shajit Sadanand, 2018, this is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Deliberate self-poisoning (DSH) is an important problem in the developing world, where the case fatality rate is far higher than in industrialized countries - 20% vs. less than 1% in UK (Hawton K *et al*, 2009). One reason for this large difference is the lack of antidotes for many of the poisons used in poor agricultural communities. DSH contributes to 1.5% of all deaths, making it the 10th highest cause of death globally. Self-inflicted injuries and, especially, self-poisoning are major public health problems in the developing world. 63% of DSH global deaths occur in the Asia Pacific region, especially in rural areas, where there is easy access to highly toxic pesticides (Eddleston M *et al*, 2004).

The WHO's recent *World Report on Violence and Health* recommends that suicide prevention strategies focus on the identification and treatment of people with mental disorders (Krug EG *et al*, 2002). DSH in developing countries

occurs predominantly among individuals aged 15-40 years, is usually of low intentionality with minimal psychiatric morbidity, and occurs essentially in rural populations (Eddleston M *et al*, 2002).

Poisonous plants are a very important method of toxic exposure. It is being consumed frequently either by accident or with suicidal intentions. Although majority of exposures result in few or no side effects, some involve plants with the potential for serious poisoning. Most often poisonous plants can be mistaken for a similar looking edible plant especially by children. The most frequently consumed lethal plant poisons in middle parts of Kerala are Yellow oleander (*Thevetia peruviana*), Oduku (*Cleistanthus collinus*) and *Abrus precatorius*.

Yellow oleander (*Thevetia peruviana*) is an ever-green, ornamental plant belonging to the family Apocynaceae. Accidental or intentional self-harm, using *T. peruviana* is prevalent in south Asian countries, especially in India and Sri

*Corresponding author: **Jayachandran NV**
Medicine, Govt. Medical College, Calicut

Lanka (Bora M. M *et al* 2013). All parts of the plant are poisonous, especially the seeds. Ingestion of Oleander seeds or leaves is a common cause of accidental poisoning worldwide, particularly among children (Middleton WS *et al*, 1936).

Cleistanthus collinus poisoning is a common suicidal poison used in rural southern India. There is paucity of information on human studies about this poisoning at global level. Poisoning usually occurs following intentional ingestion of the leaves with mortality as high as 30%, usually occurs 3-7 days after ingestion (SPE Benjamin *et al*, 2006).

Abrus precatorius is a plant that originates from Southeast Asia also found in subtropical areas of the world. Its name Abrus, meaning beautiful or graceful, is used to describe the appearance of the seed. The seed is found in a variety of colours most commonly red with a glossy appearance with the black band at the end that attaches to the plant, also in black and orange (Olmes S *et al*, 2004).

Plant poisoning is an important cause of morbidity and mortality (Shankar V *et al*, 2009). However there are only very few studies on clinical profile of plant poisoning from south India. (Bammigatti, C *et al*, 2013)

So we decided to study the clinical profile of plant poisoning in our area. The objective of the study was to study the clinical features in patients admitted with plant poisoning and to study the effect of various plant poisoning on metabolic parameters using standard laboratory investigations.

MATERIALS AND METHODS

This is a cross sectional observational study to analyze clinical and laboratory profile of plant poisoning. All patients admitted with plant poisoning in Govt Medical College Thrissur during a period of one year (2012) were taken in to study. Patients with documented heart disease, patients with pre-existing cardiac arrhythmia and those who are on treatment for same and patients with renal failure were excluded. Informed consent was taken from all patients and the study got approval from institutional ethics committee.

Statistical analysis was done using EPI INFO version 7 and SPSS version 16. Quantitative variables were reported as mean \pm SD and the qualitative variables as percentage. The Chi-square test and student's T test were used in analysis of risk factors.

Detailed history including the name of plant consumed, time of consumption, part of plant consumed, amount of plant part, time taken after ingestion of poison to receive stomach wash were asked. The history of consumption of particular plant was brought forward in all cases by either the patient or the relatives, who either witnessed or noted the circumstantial evidence of poison consumption. The natives of Palakkad district, from where the majority of cases presented, were all familiar with particular plant, because of its ubiquitous presence in their neighborhood and the high frequency of consumption of the plant for suicidal intent. Some of the patients were shown the samples of plant leaves and seeds for clarification. Plant parts were also noted in vomitus and the return of gastric lavage in most of the cases.

Patients were closely monitored for symptoms including nausea, vomiting, abdominal pain or distension, loose stools,

palpitation, dyspnoea, altered sensorium, muscle weakness and decreased urine output. Altered sensorium included coma, stupor, disorientation, or delirium. Coma is an imprecise term, describing a state in which the patient's response to external stimuli or inner needs is grossly impaired. Stupor describes a state where the patient, although inaccessible, shows some response to painful stimuli. Disorientation means that the person is conscious but muddled in time, place and person. Delirium refers to disorientation, or dementia, occurring in the context of drowsiness, or clouding of consciousness, in which the patient is more accessible than in stupor. Drowsiness is similar to light sleep and is characterized by easy arousal and the persistence of alertness for brief periods. Confusion is a mental and behavioural state of reduced comprehension, coherence, and capacity to reason.

A complete physical examination including pulse, Blood pressure, Respiratory rate, and relevant system examination done

Tachycardia is defined as a pulse rate >100 beats per minute, and bradycardia as pulse rate <60 /min, hypotension as systolic Blood pressure (BP) less than 90mm, and hypertension as BP more than 140/90mm hg and tachypnea as respiratory rate >20 /min.

Laboratory parameters checked were Hemoglobin (Hb), Total leucocyte count (TC), Differential Leucocyte count (DC), Platelet Count (PLT), Random Blood Sugar (RBS), Blood Urea (B.Ur), Serum Creatinine (S.Cr), and Liver Function Test (LFT). Serum Sodium (S.Na), Serum Potassium (S.K), Electrocardiogram (ECG) were checked at admission, 24 hours and 48 hours after admission.

A TC more than 11,000/ μ L is taken as leucocytosis, and less than 4000/ μ L as leucocytosis. Acute Renal Failure (ARF) is defined as a 0.5 mg/dL rise in S.Cr if the baseline value was ≤ 1.9 mg/dL, a 1.0 mg/dL rise if the baseline value was 2.0 to 4.9 mg/dL, and a 1.5 mg/dL if the baseline value was ≥ 5.0 mg/dL. Normal Serum Glutamate Oxaloacetate Transaminase (SGOT), Serum Glutamate Pyruvate Transaminase (SGPT) levels are taken as less than 40IU /L. Elevated Alkaline Phosphatase (ALP) is considered if 3 times of the normal value. Normal ALP is 40-140IU/l.

S.Na level below 135 meq/l is taken as hyponatremia, above 145meq/l is taken as hypernatremia. Hypokalemia is defined as S.K below 3.6 meq/l and Hyperkalemia as S.potassium above 5.5meq/l.

Recording of ECG was done using B.P.L. machine at admission, then after 24 and 48hours. ECG was analysed for rate, rhythm, PR interval, ST-T changes, U waves and QTc.

Heart rate was calculated from the ECG by the formula, 1500/no. of small squares. Rate above 100/min is taken as tachycardia, below 60 /minute as bradycardia. Normal PR interval is 0.12 to 0.20 sec. The normal QRS duration is 0.06 to 0.10 seconds (2 1/2 small boxes). The normal ST segment is isoelectric. The QTc is calculated as QT interval \div square root of the RR interval (in sec). The normal QTc is ≤ 0.44 sec. U wave may be seen normally in some leads, especially the right precordial leads V2 to V4. The amplitude of the U wave is usually less than 0.2 mV and is clearly separate from the T

wave. If U wave amplitude is $>0.2\text{mV}$ or U wave following an inverted Twave is taken as abnormal U wave.

All the treatment decisions including potassium replacement were at the discretion of treating unit.

Outcome was measured by the number of survivors, symptoms pertaining to each system, metabolic and ECG abnormalities, factors predicting poor prognosis.

RESULTS

143 cases of plant poisons were studied during one year period. Out of 143 cases, 57 patients consumed yellow oleander, 76 patients consumed oduku and 10 patients consumed abrus. 52.45% patients belonged to age group 21 to 40 years, 26.57% patients were between 13 to 20 years, 13.29% patients were between 41 to 60 years and 7.69% patients above 61 years. Mean age of the population is 31.09 years (range 13 years to 80 years). The male to female ratio was almost equal. 73 patients (51.05%) stayed in hospital for 3 days, 45 patients (31.47%) for 4 days, 12 patients (8.39%) for 5 days and 11 patients (7.69%) stayed for 2 days. 3 patients (1.4%) died in the hospital within 24 hours. Mean duration of hospital stay was 3.37 days.

Yellow Oleander

Out of total 143 patients 57 were admitted following consumption of yellow oleander. Out of 57 patients, majority 31(54.39%) were females, and males were 26(45.61%)

Majority of patients [total 31(54.39%)] were between 21-39 years, 20 patients (35.09%) were between 13 to 20 years. Mean age of the population was 28.00 with a standard deviation of 12.45.

Ages ranged from 13 to 75 years. Among total cases, 41(71.93%) patients consumed leaves and 16(28.07%) patients consumed seeds.

The average time taken to receive stomach wash after consumption was 3.8 hours ranging from a minimum of 1 hour to maximum of 24 hours. Most common presenting symptom was vomiting in 33 patients (58.93%). 8 patients had abdominal pain, 6 patients had giddiness, 3 patients presented with altered level of consciousness and 2 patients with palpitation. 15 patients were asymptomatic.

Bradycardia was observed in 17 patients on admission, in 8 patients after 24 hours, and 3 patients after 48 hours. Tachycardia was seen only in 1 patient on admission and after 24 hours and none after 48 hours. Majority of patients had normal pulse rate on admission after 24 hours and after 48 hours. Rhythm was irregular in 7 patients on admission, 6 patients after 24 hours, and 1 patient after 48 hours. Most of the patients (42) had normal ECG. 9 patients had sinus bradycardia, 3 patients had first degree heart block, and 1 patient had second degree heart block. None had complete heart block.

Out of 57 patients 3 patients had ST-T changes; none had U waves or QTc prolongation. On admission, 48 patients had normal potassium level, 6 patients had hyperkalemia and 1 patient had hypokalemia

Mean potassium value was 4.18 with a standard deviation of 0.69(range 3.8 to 5.9meq/l). Potassium values ranged from 2.4 to 5.9 meq/l. After 24 hours, 50 patients had normal potassium and 5 patients had hyperkalemia. Mean potassium value was 4.3, ranging from 3 meq/l to 5.8meq/l.

At 48 hours 53 patients had normokalemia, 1 patient had hyperkalemia. Two patients who consumed yellow oleander expired. First patient was 17 year old female presented with ingestion of seeds >5 numbers, presented without any symptoms, developed hyperkalemia, potassium value was 5.9 meq/l managed with ventilator support, but expired within 12 hours. Second patient was a 75 year old male who presented with ingestion of seeds more than 5 in number, had nausea, vomiting and altered sensorium, developed hypotension on second day and had received ventilator support, but expired on 2nd day of admission.

Oduku Poisoning

Out of 143 patients, 76 patients were admitted with consumption of Oduku. Majority of the patients - 40 patients (52.63%) were between 21 to 40 years of age. Mean age of the population was 33.5 years with a standard deviation of 16.10. The ages were ranging from 14 to 80 years. 75 patients (98.68%) consumed leaves; only one patient (1.32%) consumed seed. Mean duration to receive stomach wash after consumption of plant was 3.61 hours with a standard deviation of 1.76 (range 1 hour to 8 hours). Most of the patients -43 patients (57.33%) were asymptomatic. Among those with symptoms, the most common presenting symptom was nausea in 41 patients (54.67%) while 33 patients (44.00%) had vomiting, 7 patients (9.33%) had abdominal pain, 1 patient (1.33%) had palpitation and altered sensorium. Only 1 patient had bradycardia at the time of admission, all other patients were having normal pulse rate on admission, after 24 and 48 hours. Rhythm was normal in all patients.

Abrus Precatorius

Among 143 cases, 10 cases were admitted following ingestion of Abrus precatorius. Mean age of the population was 27.11 with a standard deviation of 12.72. Minimum age was 13 and maximum 48 years. 8 of the 9 patients had consumed seeds while one patient consumed leaves. All of them swallowed seeds without crushing it. Leaves were less than 5 in number and consumed after chewing. One patient was having tachycardia at the time of admission which persisted beyond 24 hours. All of them were having normal pulse rate after 48 hours. All of the patients were having normal systolic BP on admission, after 24 hours and 48 hours. Total count was elevated in 2 patients. No electrolyte abnormalities or ECG changes noted in any patient. All patients were managed supportively with stomach wash and laxatives. No mortality was observed in our study.

DISCUSSION

This study evaluated the clinical features and laboratory abnormalities seen in patients admitted with plant poisoning and factors predicting poor prognosis. Most of the patients had consumed Oduku (*Cleistanthus collinus*) (53.14%), followed by Yellow oleander (39.86%) and *Abrus precatorius* (6.99%). Among 143 patients, majority (53.15%) consumed oduku. Most of the patients were males (41/76). This male

preponderance is in contrast to many of the studies where there is female preponderance (Subrahmanyam DK et al, 2003).

Most common presenting symptoms were nausea and vomiting followed by abdominal pain and altered sensorium. Presence of altered sensorium was a poor prognostic factor. Most common metabolic abnormality found was hypokalemia. Patients with hypokalemia had poor prognosis. Most common ECG finding observed was ST-T changes followed by U waves. ECG changes were shown to be a poor prognostic sign. Mortality in oduku poisoning found was 2.63%.

Majority of patients with Yellow oleander poisoning were females and were between the age group of 21 to 40 years. Most common presenting complaints in this group were nausea and vomiting followed by abdominal pain, giddiness, altered sensorium and palpitation. Presence of altered sensorium indicates poor prognosis. No significant difference in mortality was found in patients with bradycardia or hypotension and in those without bradycardia and hypotension. Most of the patients had normal ECG. Abnormal ECG findings noted were sinus bradycardia, first degree heart block and second degree heart block in that order. Mortality found in yellow oleander poisoning was 3.6%.

Abrus precatorius constituted a minor group in plant poisoning. Mean age of the population was 27.11 years and male to female ratio was almost equal. Presenting symptoms were nausea, vomiting and abdominal pain in that order of frequency. Almost all patients were having normal pulse rate, BP, biochemical and ECG parameters. No mortality was observed in this group.

This study was conducted in relatively small number of patients. It has to be extrapolated to a larger population with longer follow up.

References

- Bammigatti, C et al., Suryanarayana, B. S., Harichandra Kumar, K. T., & Ganesh Kumar, S. (2013). Pattern and outcome of *Cleistanthus collinus* (Oduvanthalai) poisoning in a tertiary care teaching hospital in South India. *Journal of Forensic and Legal Medicine*, 20, 959-961. doi:10.1016/j.jflm.2013.08.011
- Bora M. M., Gogoi, P., Deka, D. C., & Kakati, D. K. (2014). Synthesis and characterization of yellow oleander (*Thevetia peruviana*) seed oil-based alkyd resin. *Industrial Crops and Products*, 52, 721-728. doi:10.1016/j.indcrop.2013.11.012
- Eddleston M, Phillips MR. Self poisoning with pesticides. *BMJ*. 2004;328:42-4
- Eddleston M. Patterns and problems of deliberate self-poisoning in the developing world. *QJM*. 2000;93:715-31
- Hawton K, Heeringen K. Suicide. *Lancet*. 2009;373:1372-81.
- Krug EG, Dahlberg LL, Mercy JA, Zwi AB, Lozano R, eds. World report on violence and health. Geneva: WHO, 2002
- Middleton WS, Chen KK. Clinical results from oral administration of thevetin, a cardiac glycoside. *Am Heart J*. 1936; 11:75-88.
- Olnes S (2004) The history of ricin, abrin and related toxins. *Toxicon* 44:361-370
- Shankar, V., Jose, V. M., Bangdiwala, S. I., & Thomas, K. (2009). Epidemiology of *Cleistanthus collinus* (oduvan) poisoning: clinical features and risk factors for mortality. *International Journal of Injury Control and Safety Promotion*, 16, 223-230. doi:10.1080/174573009.03307094.
- SPE Benjamin, M Edwin Fernando, J Jerene Jayanth, B Preetha, *Cleistanthus Collinus* Poisoning. *Journal of association of physicians India* vol 54, 2006; 54:742-4
- Subrahmanyam DK, Mooney T, Raveendran R, Zachariah B. A clinical and laboratory profile of *Cleistanthus collinus* poisoning. *J Assoc Physicians India*. 2003; 51:1052-4.

How to cite this article:

Jayachandran NV et al. 2018, Clinical Profile of Plant Poisoning in a Tertiary Care Centre in Kerala. *Int J Recent Sci Res*. 9(4), pp. 25808-25811. DOI: <http://dx.doi.org/10.24327/ijrsr.2018.0904.1935>
