



A Study on the Clinical Profile and Outcome of Cerbera Odollam Poisoning in a Tertiary Care Centre in Kerala

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Abstract

Background: *Cerebera Odollam* is a small plant/shrub which grows wild over many parts of Kerala. It is the most common plant suicidal agent in the coastal areas of southern Kerala. This is an attempt to study the clinical profile and outcome of *C.odollam* poisoning in my institution.

Objectives: To study the clinical profile with respect to age, sex, methods of self-administration, circumstances of poisoning, dosage, clinical features, ECG changes, treatment and various determinants of outcome of *Cerebera Odollam* poisoning in a tertiary care centre in Kerala.

Methods: This is an observational study conducted on 72 patients admitted with history of *C.odollam* poisoning, during the study period of one and a half years. Samples were selected by convenience sampling method. The study subjects were evaluated by history and clinical examination. Blood samples were drawn for assessment of complete hemogram, RBS, RFT, LFT, and serum electrolytes. A standard 12 lead ECG including lead II was taken at the time of admission. Serial ECGs were taken to assess the progression of symptoms. The treatment given as well as the outcome were observed. The patients were in the study till they get discharged or expired. Data analysis was done using SPSS software.

Results: All the cases consumed *C.odollam* with suicidal intent. The highest number of patients belonged to the age group of 30 – 40 years. 70% of the study subjects were males. The most common method of self-administration was by mixing with food/drink (81.9%). The majority of the study population consumed half kernel (37.5%), followed by one kernel (25%). The commonest symptom was vomiting seen in 65.3% of the study population. Thrombocytopenia was seen in 13.9% of the study population. Rest of the patients had normal hemogram. Hyperkalemia was seen in 27.8% of the study population. The majority of the study population had no ECG changes (31.9%) followed by sinus bradycardia (29.2%). The duration of hospital stay for the majority of the study subjects were less than 7 days (81.9%).

Conclusion: The association between ECG changes and method of self-administration is statistically significant. There is no statistically significant association between method of self-administration with clinical symptoms, hyperkalemia, and thrombocytopenia. There was statistically significant association between dosage with symptoms, thrombocytopenia, and ECG changes. There was no statistically significant association between dosage and hyperkalemia. There was statistically significant association between dosage with the need for cardiac pacing, ICU care, duration of hospital stay, and overall mortality.

Objectives**Primary Objective**

To study the clinical profile with respect to age, sex, methods of self-administration (in cases of deliberate self-harm), circumstances of poisoning, dosage (in terms of number of kernels ingested), clinical features, ECG changes, treatment modalities and various determinants of outcome of Cerbera Odollam poisoning in a tertiary care centre in Kerala.

Secondary Objectives

- a) To study the relationship between methods of self-administration and clinical features, alteration in routine blood investigations and ECG changes in C.odollam poisoning.
- b) To study the relationship between dosage (number of kernels ingested) and clinical features, alteration in routine blood investigations, and ECG changes in C.odollam poisoning.

Methodology

Study Design: Observational study in a Tertiary Govt. Medical College

Observation And Results

Table 1: Age Distribution of the Study Population

Age	Frequency		Percentage
13 – 30	9		12.5
30 – 40	45		62.5
40 – 50	16		22.2
50 – 60	2		2.8
Mean ± SD		35.5 ± 7.3	

Study Duration: 1½ years from the date of approval from The Ethics Committee

Sample Size: 72 cases of C.odollam poisoning

Study Population**Inclusion Criteria**

All cases are above the age of 12 years. Those cases who consume C.odollam under the influence of alcohol are also included in the study.

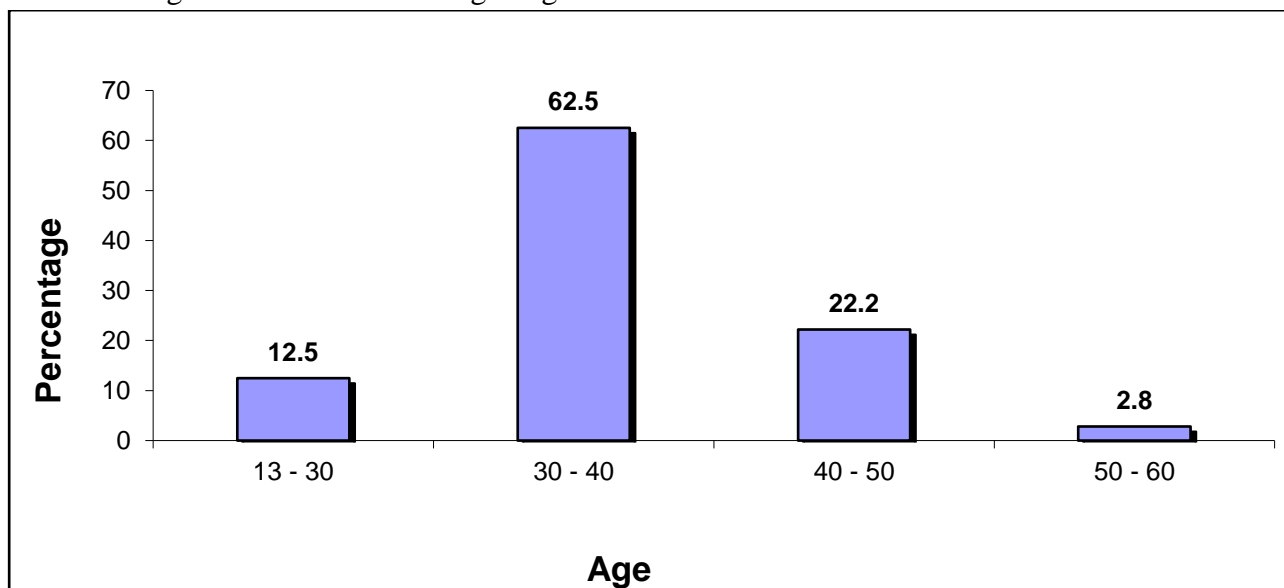
Exclusion Criteria

Mixed poisoning, i.e., those who have consumed some other poison along with odollam (alcohol is excluded) are excluded from the study.

Data Analysis

Data obtained from the study is entered into Microsoft Excel and analyzed using SPSS software version 18. Data analysis will be done using percentages. To elucidate the associations and comparisons between different parameters, Chi square test was used as non-parametric. For all statistical evaluations, a *p* value of < 0.05 was considered significant.

Fig. 1: Percentage distribution according to age



The mean age group of the study population is 35.5 years (SD 7.3).

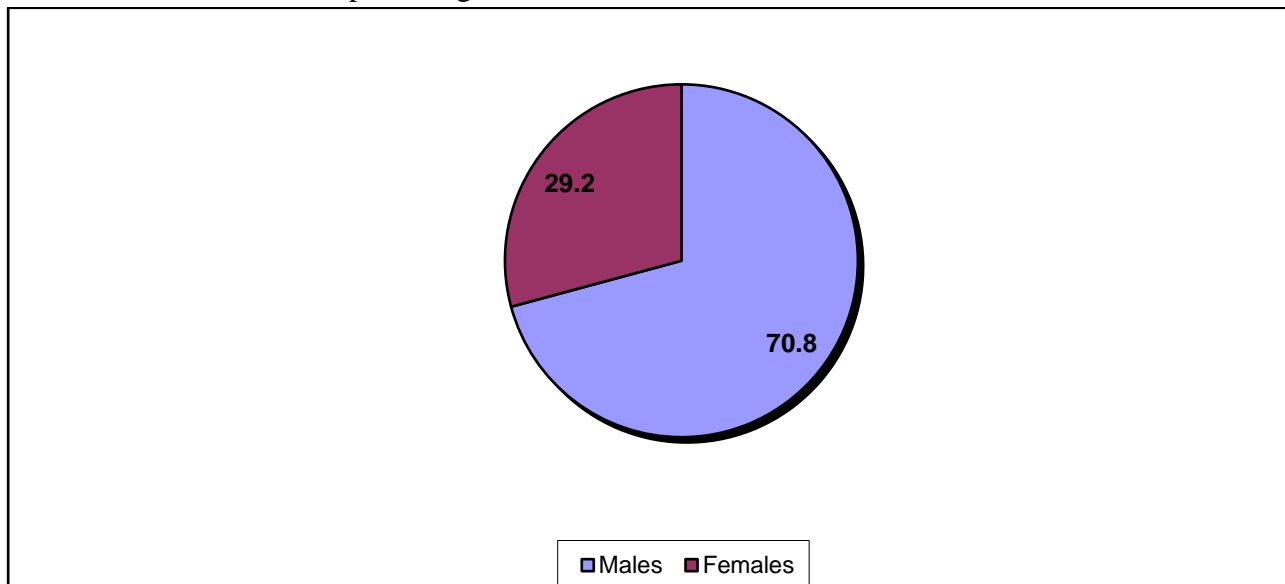
The maximum number of cases were in the age group of 30 – 40 years (62.5%).

The age group 50 – 60 years had the least number of cases (2.8%).

Table 2 Gender distribution of the study population

Sex	Frequency	Percentage
Males	51	70.8
Females	21	29.2

Fig. 2: Gender distribution in percentages



Males constituted 70.8% of the study population.

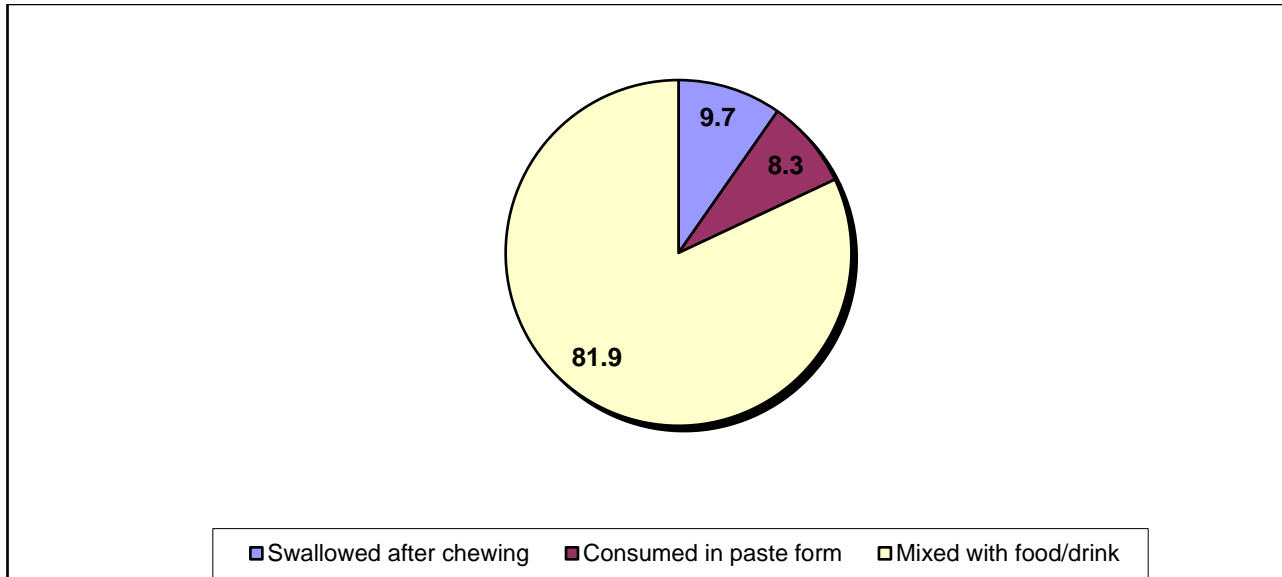
Distribution According to Circumstance of Poisoning

All the cases studied (100%) were attempted suicides (deliberate self-harm). None of the cases were homicidal or accidental ingestion.

Table 3: Percentage distribution of the sample according to method of self-administration

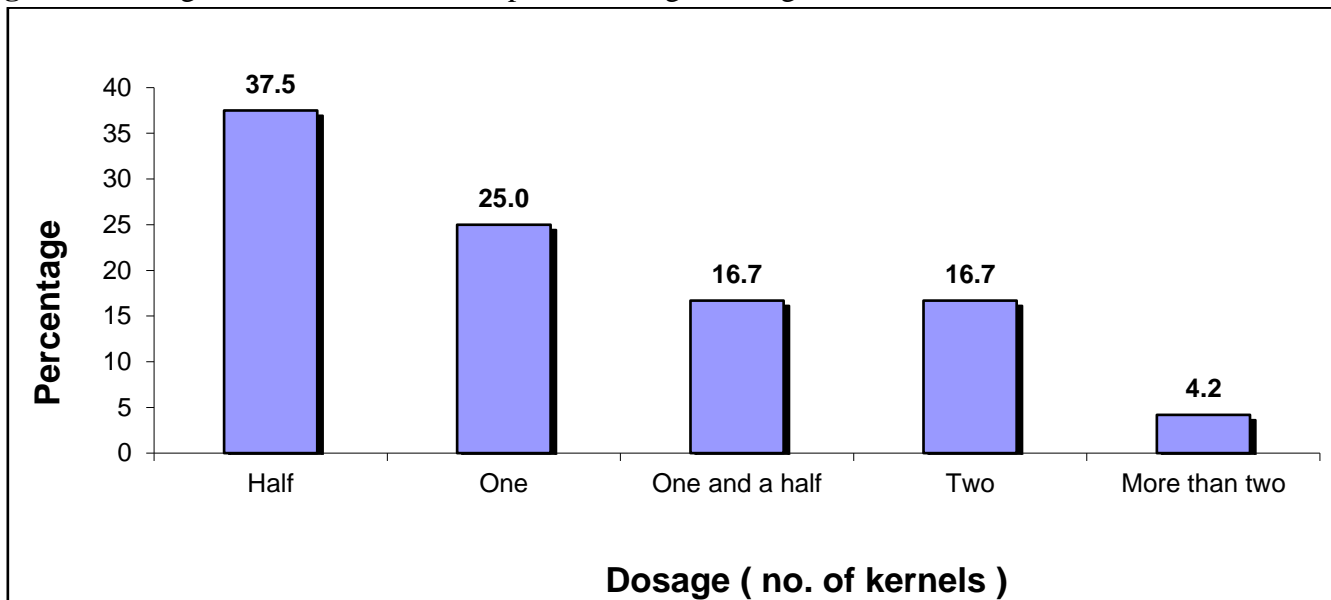
Method of self-administration	Frequency	Percentage
Swallowed after chewing	7	9.7
Consumed in paste form	6	8.3
Mixed with food/drink	59	81.9

Fig. 3: Percentage distribution according to method of self-administration



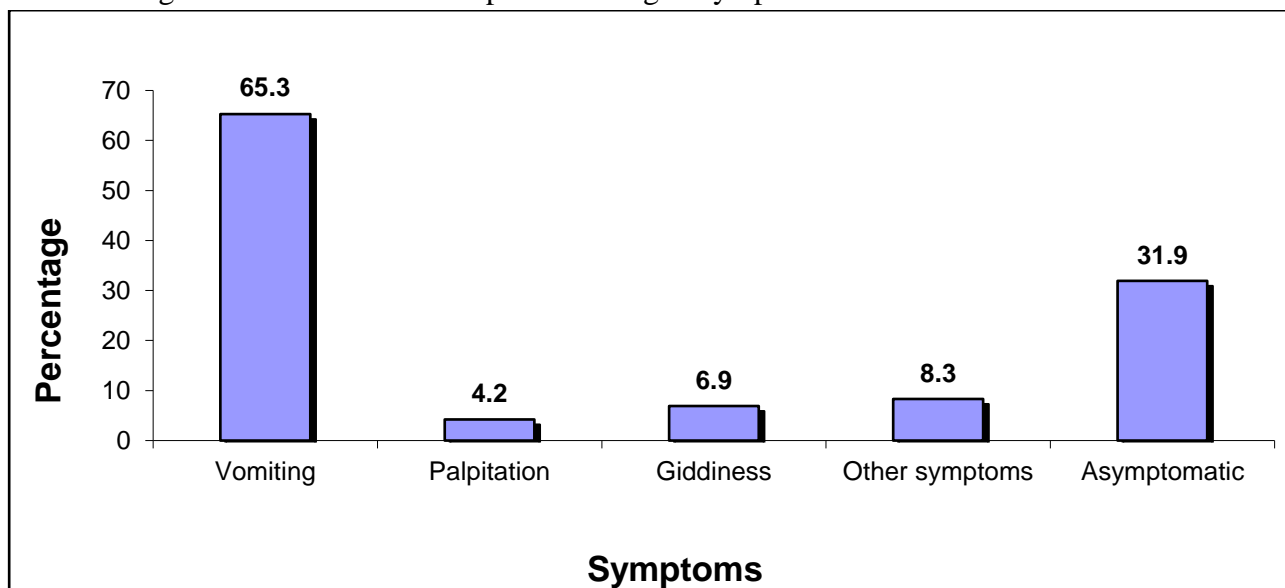
The majority of the patients consumed the poison by mixing with food or drink (81.9%).

Fig. 3: Percentage distribution of the sample according to dosage



The majority of the patients consumed half kernel (37.5%), followed by one kernel (25%), More than two kernels were consumed by 4 patients (4.2%).

Fig. 4: Percentage distribution of the sample according to symptoms



The most common symptom was vomiting (65.3%) and the least common symptom was palpitation (4.2%). 31.9% of the patients were asymptomatic.

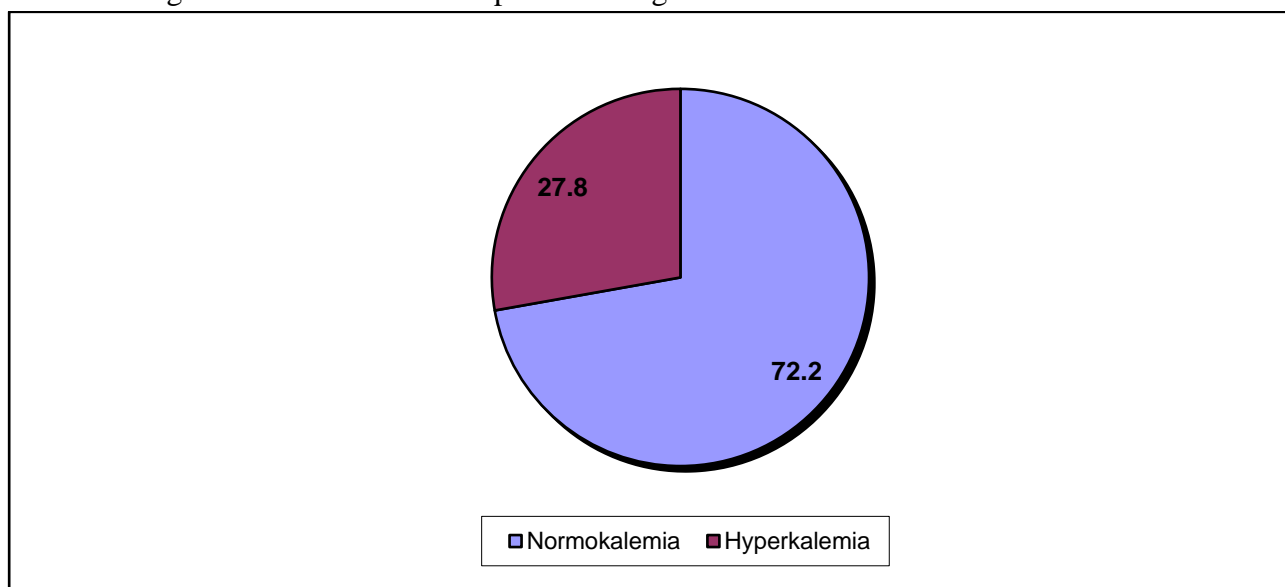
Distribution According to Change in Blood Cell Counts:

86% of the patients had normal hemogram. 13.9% of the patients had thrombocytopenia.

Table 4: Percentage distribution of the sample according to Serum Potassium level

Serum Potassium level	Frequency	Percentage
Normokalemia	52	72.2
Hyperkalemia	20	27.8

Fig. 5: Percentage distribution of the sample according to Serum Potassium level



72.2% of the patients had normal serum potassium level. 27.8% of the patients had hyperkalemia.

Table 5: Percentage distribution of the sample according to ECG changes

ECG changes	Frequency	Percentage
No change	23	31.9
Sinus bradycardia	21	29.2
First-degree heart block	8	11.1
Second-degree heart block	15	20.8
Complete heart block	5	6.9

Table 6: Percentage distribution of the sample according to Atropine administration

Atropine given	Frequency	Percentage
Yes	72	100.0
No	0	0.0

Atropine was given to all the patients.

Table 7: Percentage distribution of the sample according to Anti-hyperkalemic measures

Anti-hyperkalemic measures	Frequency	Percentage
Yes	20	27.8
No	52	72.2

27.8% of patients in the study had hyperkalemia and anti-hyperkalemic measures were given to all of them.

Table 8: Percentage distribution of the sample according to Cardiac pacing

Cardiac pacing	Frequency	Percentage
Yes	10	13.9
No	62	86.1

10 out of 72 patients (10%) required cardiac pacing.

Table 9: Percentage distribution of the sample according to duration of hospital stay

Duration of hospital stay	Frequency	Percentage
Less than 7 days	59	81.9
7 – 10 days	13	18.1

Only 18 out of 72 patients (18.1%) had hospital stay more than a week. For 82% of the patients, the duration of hospital stay is around 7 – 10 days.

Distribution According to ICU care:

ICU care was required for 17 out of 72 patients (23.6%).

Distribution According to Outcome:

63 out of 72 patients (87.5%) were discharged after giving treatment. 9 patients (12.5%) had expired.

Comparison of blood investigation based on method of administration:

Thrombocytopenia was seen in 15.4% of those patients who swallowed the kernel directly and in 13.6% of those who consumed it with food/drink. With a p value of 0.863, there is no statistically significant association between method of self-administration and thrombocytopenia. Hyperkalemia is seen in 30.8% of those who

swallowed the kernel directly and in 27.1% of those who consumed it by mixing with food/drink. With a *p* value of 0.7, there is no statistically

significant association between method of self-administration and hyperkalemia.

Method of Administration and ECG changes

Table 10: Comparison of ECG changes based on method of administration

ECG changes	Direct swallowing		Mixed with food/drink		x ²	p
	Count	%	Count	%		
No change	4	30.8	19	32.2	18.52	p < 0.01
Sinus Bradycardia	0	0.0	21	35.6		
First-degree heart block	1	7.7	7	11.9		
Second-degree heart block	4	30.8	11	18.6		
Complete heart block	4	30.8	1	1.7		

With a *p* value of less than 0.01, there is statistically significant association between method of self-administration and ECG changes.

Method of Administration and Selected Variables

There is statistically significant association between method of administration and duration of hospital stay (*p* value of 0.035). There is statistically significant association between method of administration and the need for ICU care (*p* value of 0.035).

Method of Administration and Outcome

With a *p* value of 0.028, there is statistically significant association between method of self-administration and outcome.

Dosage and Clinical Symptoms

Table 11: Comparison of clinical symptoms based on dosage

Clinical Symptoms	Half / One		More than One		x ²	p
	Count	%	Count	%		
Vomiting	24	53.3	23	85.2	7.55	0.006
Palpitation	0	0.0	3	11.1	5.22	0.022
Giddiness	1	2.2	4	14.8	4.14	0.042
Other symptoms	4	8.9	2	7.4	0.05	0.826
Asymptomatic	19	42.2	4	14.8	5.83	0.016

Those who consumed more kernels were more symptomatic (*p* value < 0.05). The most common symptom is vomiting (*p* value = 0.006).

Dosage and Blood Investigations

There is statistically significant association between dosage and thrombocytopenia (*p* value of 0.003). But there is no significant association between dosage and hyperkalemia (*p* value is 0.7).

Dosage and Outcome

There is significant association between dosage and change of recovery. Those who had consumed more number of kernels are at increased risk of death (*p* value is 0.008).

Discussion

A total of 72 patients admitted with history of alleged consumption of C. odollam poisoning were included in the study after satisfying inclusion and exclusion criteria. The most common age group presented with history of alleged consumption of C. odollam poisoning was 30 – 40 years, accounting for 62.5% of the study population. This observation was different from the study conducted previously by Prof. V.C. Mathew Roy et al (1983), which had noticed that this poisoning was more common in the age group of 20 – 30 years which accounted for about 46% of the study population.^[8] The least representation was for the age group of 50 – 60 years, which constituted for just 2.8% of the study population.

There was male predominance, constituting 70% of the study population. The previous authors have also noticed a similar trend with male patients constituting about 62% of the study population.

All of the 72 cases were ones of attempted suicides^[7,13]. None of the cases were homicidal / accidental in nature.

The most common method of self-administration was by mixing with food / drink, accounting for 81.9% of all cases. The percentage of cases who consumed the kernel by chewing and by consuming in a paste form were almost similar (9.7% and 8.3%, respectively).

The majority of the study population consumed half kernel (37.5%), followed by one kernel (25%)^[2]. The number of patients who consumed one and a half, as well as two kernels were identical (16.7% of the study population). Only 4.2% of the study population consumed more than 2 kernels.

The most common symptom was vomiting (present in 65.3% of the study population). This observation was consistent with the one made by Prof. V.C. Mathew Roy et al (1983), who had observed that GI symptoms were the common symptoms during presentation^[8, 12] 31.9% of the study population were asymptomatic.

Regarding routine blood investigation, 86% of the total study population had normal hemogram and 13.9% of the study population had thrombocytopenia. This observation was different from the one made by Menon et al, in which 50% of the study population had thrombocytopenia.^[1] Serum potassium levels were normal in 72.2% of the study population. 27.8% of the study population had hyperkalemia^[2, 6]. Regarding ECG changes, the majority of the study population had no ECG changes (31.9%) followed by sinus bradycardia (29.2%). Second degree heart block was seen in 20.8% of the study population. Only 6.9% had complete heart block^[3, 4, 5, 11, 12]. The ECG changes observed in this study were different from ECG changes observed by Menon et al, who observed that the most common ECG abnormality was sinus bradycardia.^[1]

Regarding treatment given, all of the patients were treated with atropine^[9]. Anti-hyperkalemic measures were given to 27.8% of the study population. Cardiac pacing were required in 10 out of 72 subjects (13.9% of the study population).

The duration of hospital stay for the majority of the study population were less than 7 days (81.9%) and the duration of hospital stay for the rest 18.9% were 7 – 10 days. 76.4% of the study population were managed in the general wards and 23.6% of the subjects required ICU care. 63 out of the 72 subjects got discharged after cure (87.5%) and 9 out of the 72 subjects got discharged after cure (87.5%) and 9 out of the 72 subjects (12.5%) expired.

Regarding association between method of self-administration and symptoms, a statistically significant association could not be established as *p* value obtained was 0.106. Similarly, the *p* value obtained for association between method of self-administration and thrombocytopenia was 0.83 and between method of self-administration and hyperkalemia was 0.79. Hence, a statistically significant association was not obtained between

method of self-administration with thrombocytopenia and hyperkalemia.

ECG changes were more evident when the poison was consumed by mixing with food or drink. A p value of < 0.01 was obtained and hence there is association between the method of self-administration and ECG changes.

Duration of hospital stay and the need for ICU care were more in the subjects who had consumed the poison by mixing with food / drink. A p value of 0.035 and 0.034 obtained, respectively, is suggestive of statistically significant association between method of self-administration and duration of hospital stay and the need for ICU care.

The incidence of vomiting among those who had consumed a higher dosage (more than 1 kernel) was more than those who had consumed less than one kernel. This observation was taken to be statistically significant as the p value was 0.006.

Thrombocytopenia was more among those subjects who had consumed more than one kernel. This observation was also found to be statistically significant as the p value was 0.03.

The occurrence of hyperkalemia was similar between those who had consumed more than one kernel and those who had consumed less than one kernel. The p value obtained for the association between dosage and hyperkalemia was 0.786. Hence, a statistically significant association was not obtained between dosage and hyperkalemia in this study.

All types of ECG changes (sinus bradycardia as well as heart blocks) were more evident in those subjects who had consumed more than one kernel. The p value obtained for association between dosage and ECG changes was less than 0.01. Hence, statistically significant association exists between dosage and ECG changes.

The need for cardiac pacing was more in those who had consumed more than one kernel than those who had consumed less than one kernel^[14]. The association between dosage and the need for cardiac pacing was taken to be statistically significant as the p value obtained was 0.022.

The duration of hospital stay was more in those subjects who had consumed a higher dosage. The p value obtained was 0.009 and the association was statistically significant. The p value estimated for association between dosage and the need for ICU care was 0.008 indicating a statistically significant association between dosage and the need for ICU care. The mortality among those who had consumed more than one kernel was high as compared to those who had consumed less than one kernel. This observation was statistically significant as the p value for the association between dosage and mortality was 0.008.

Conclusions

1. The majority of patients who got admitted with history of alleged consumption of C.odollam are young people in the age group of 30 – 40 years. The mean age was 35.5 with a SD of 7.3. 70% of the total number of cases were males.
2. All the cases (100%) consumed the poison with suicidal intent. The most common method of self-administration was by mixing with food / drink (81.2%).
3. The majority of the study population consumed half kernel (37.5%), followed by one kernel (25%).
4. The most common symptom was vomiting (seen in 65.3% of the study population).
5. Only 13.9% of the study population had thrombocytopenia. 86.1% had normal hemogram.
6. Serum potassium levels were normal in 72.2% of the study population. 27.8% of the study population had hyperkalemia.
7. The majority of the study population had no ECG changes (31.9%), followed by sinus bradycardia (29.2%). Second-degree heart block was seen in 20.8% of

- the study population. Only 6.9% had complete heart block.
8. All of the patients were treated with atropine. Anti-hyperkalemic measures were given to 27.8% of the study population. Cardiac pacing were required in 10 out of 72 cases (13.9% of the study population).
 9. The duration of hospital stay for the majority of the study subjects were less than days (81.9%).
 10. Only 23.6% of the total study subjects required ICU care. Rest of the 76.4% of the subjects were managed in the general wards.
 11. 63 out of the 72 subjects got discharged after cure (87.5%) and 9 out of the 72 subjects (12.5%) expired.
 12. No statistically significant association is seen between
 - a) the method of self-administration and frequency and severity of clinical symptoms.
 - b) the method of self-administration and thrombocytopenia.
 - c) the method of self-administration and hyperkalemia.
 - d) dosage and hyperkalemia (p value is 0.786).
 13. The association between ECG changes and method of self-administration is statistically significant (p value is < 0.01). ECG changes are more prominent in those patients who had consumed the poison by mixing with food / drink.
 14. Duration of hospital stay and the need for ICU care are more in the subjects who had consumed the poison by mixing with food / drink (p values are 0.035 and 0.034, respectively) and hence the association between method of administration and these parameters is statistically significant.
 15. There is statistically significant association between
 - a) Dosage and symptoms (p value is 0.006).
 - b) Dosage and thrombocytopenia (p value is 0.03).
 - c) Dosage and ECG changes (p value is less than 0.01).
 - d) Dosage and the need for cardiac pacing (p value is 0.022).
 - e) Dosage and the need for ICU care (p value is 0.008).
 - f) Dosage and duration of hospital stay (p value is 0.009).
 - g) Dosage and mortality (p value is 0.008).

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