

Prevalence of Yellow Oleander (*Thevetia peruviana*) Poisoning in Eastern Part of the Srilanka

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Abstract: Poisoning due to deliberate self-harm (DSH) with the seeds of yellow oleander (*Thevetia peruviana*) results in significant morbidity and mortality each year in South Asia. Yellow oleander seeds contain highly toxic cardiac glycosides including thevetins A and B and neriifolin. A cross-sectional observational study was conducted in Teaching Hospital Batticaloa, SriLanka among all DSH to see the prevalence of yellow oleander poisoning. Out of 121 DSH patients, 33(31.4%), 9 (27.3%) male and 24 (72.7%) female had seeds of yellow oleander poisoning. Among them, 3 (9.1%) patients got 1st-degree heart block while 2 (6.1%) got 2nd-degree heart block and 1(3%) patient got 3rd-degree heart block. Unfortunately, 2 (6.1%) patients have died. Though the numbers of suicide are already quite high, it is estimated that the real figures may be even higher in Sri Lanka. The under-reporting is due to deaths not being recorded or being misclassified for different reasons such as stigma, legal harassment or insurance benefits. The main reasons for the oleander poisoning were a confrontation with their parents and siblings.

Keywords: Yellow oleander, *Thevetia peruviana*, deliberate self-harm (DSH) and yellow oleander.

INTRODUCTION

Each day someone takes their own life by ingesting plant and pesticide poison in SriLanka. Poisoning due to deliberate self-harm (DSH) with the seeds of yellow oleander (*Thevetia peruviana*), 'lucky nut' in English, 'kaneru' in Sinhala and 'manjalalari' in Tamil results in significant, morbidity and mortality each year in South Asia [1, 2]. It is highly poisonous and even ingestion of single seed can cause death. As seeds taste bitter most patients eat seeds with sugar.

In the last three decades, the country has seen a worrying trend of yellow oleander ingestion in an attempt to commit suicide. As a readily available method of poisoning oneself, the growing figures of oleander poisoning have caused concern for the health care services and the native population. Yellow oleander seeds contain highly toxic cardiac glycosides including thevetins A and B and neriifolin. A wide variety of dysrhythmias occur following ingestion. Yellow oleander seeds contain highly toxic cardiac glycosides including thevetins A and B and neriifolin [3].

Yellow oleander poisoning has been described as an epidemic and largely affects Northern and Eastern part of the Sri Lanka where one of the two largest ethnic groups lives, the Tamils. Yellow oleander poisoning is the commonest method of suicide after pesticide poisoning in SriLanka [4].

Yellow oleander is found throughout most of the tropics as a decorative tree or shrub. It grows extensively in gardens throughout Northern and Eastern part of Sri Lanka. Pesticide self-poisoning kills at least 250 000 to 370 000 people each year, while plant or medicine self-poisoning is responsible for several thousand more deaths [5].

Sri Lanka has often had an alarmingly high rate of suicide in a global context [6]. In 1991, Sri Lanka had the peak suicide rate in the world at 47 per 100,000 populations [7]. Figures of suicide rates in Sri Lanka have since remained high. In subsequent years its suicide rate declined dramatically, a fall in rates which coincided with a series of bans on WHO class I pesticides starting in 1984 and reducing the toxicity of the pesticides available should reduce the case fatality associated with intentional poisoning and alter the epidemiology (age/sex patterns) of suicide [8].

Though the numbers of suicide are already quite high, it is estimated that the real figures may be even higher in Sri Lanka. The under-reporting is due to deaths not being recorded or being misclassified for different reasons such as stigma, legal harassment or insurance benefits. Suicide has not been considered a criminal offense in Sri Lanka since 1998 [9].

Prevalence of poisoning differ in various parts of the SriLanka, it also depends on socioeconomic, cultural environment and availability of poisonous substances existing in that area. Management of these Patients will be greatly improved if common causes of poisoning and other epidemiological factors are properly defined. Our aim of the study is to see the pattern and prevalence of the seeds of yellow oleander poisoning.

MATERIALS AND METHODS

This is a cross-sectional observational study in patients with 12 years of age and above who were admitted with deliberate self-harm (DSH) at Teaching Hospital Batticaloa, in SriLanka to identify the prevalence of yellow oleander (*Thevetia peruviana*) poisoning among DSH. All consecutive cases with DSH admitted on all Days over a period of three months from 12th of April to 12th of July were observed. Details of all the patients who were 12 years of age or older, and who had a history of acute poisoning ingestion, were collected in this study. Nature of poisoning was confirmed from patient’s clinical features, reference letter and/or from the bottle of poison produced. Patients are initially resuscitated in the emergency department. Specific antidotes were given according to the poison exposed. Gastric lavage, activated charcoal and other supportive care were provided in appropriate cases. Demographic features of the patients, presenting clinical symptoms and signs were noted. Patients were followed up until recovery or death. Complications

developed during the hospital stay and in-hospital mortality were recorded.

A descriptive analysis was done on all variables to obtain a frequency distribution. Quantitative variables were reported with range, frequency and percentage. Proportions were analyzed with chi-square test or 2-tailed Fisher's exact test whenever appropriate. P value of 0.05 or less was considered as statistically significant. Data were analyzed using Statistical Package of Social Sciences version 19.

RESULT

In the present study, 121 cases of poisoning were reviewed prospectively. Among them, 119 cases (98.66%) were of intentional poisoning and only two cases (1.65%) were of accidental poisoning. In all the cases, the route of exposure was oral. Out of 121 patients, 83 (68.6%) were females and 38 (31.4%) were males. In the present study, the commonest poisoning agent was yellow oleander seeds 33 (27.3 %) followed by organophosphorus compounds 23(19%) and Paracetamol overdose 22 (18.2%). Drugs other than paracetamol 11 (9.1%), pesticide other than organophosphorus compounds 9(7.4%), run rat 6(5%) and cerebral manga 6(5%) and others 11 (9.1%).

Out of 33(31.4%) yellow oleander poison, 9 (27.3%) male and 24 (72.7%) female (Table 1). Most of the patients 25 (75.75%) were young under age group of 12-29-years-old (Table 1). Almost all 33 (100%) cases were Tamils ethnicity. Reasons for self-ingestion were vary, 10 (30.3%). Nearly one-third 10 (30.3%). of victim had love affairs Other reasons were quarrel with father, mother and sibling, failure in exam and others. 25(75.8%) patients were discharged without any complications while 2 (6.1%) patients were died. Another 3 (9.1%) patients got 1st degree heart block while 2 (6.1%) got 2nd degree heart block and 1(3%) patient got 3rd degree heart block (Table 2).

Table 1: Relation with age and sex

Age distribution	Male	female	Total
12-19	2(6.1%)	13	15(45.5%)
20-29	4(12.2%)	6(18.2%)	10(30.3%)
30-39	2(6.1%)	4(12.2%)	6(18.2%)
40-49	1(3.0%)	0	1(3.0%)
>50	0	1(3.0%)	1(3.0%)
Total	9	24	33(100%)

Table 2: Outcome of Yellow-oleander poisoning

Outcome	Total
Discharge	25(75.8%)
Heart block	6(18.2%)
death	2(6.1%)
Total	33

DISCUSSION

This study reveals that the pattern of acute self-poisoning over a four months in Teaching Hospital Batticaloa, Sri Lanka. The population incidence of acute self-poisoning was very high in this setting with young women being the most vulnerable. The type of poison may vary according to the accessibility of agents. Most of the global death toll from pesticides is in the Asian region, where many people have ready access to pesticides. Acute poisoning remains a major public health problem in rural Sri Lanka and pesticide poisoning remains the most important poison [10].

However, in this study prevalence of yellow oleander 33 (27.3 %) poison is slightly higher than organophosphorus poison 23(19%). An observational study conducted in India, where high prevalence among DSH was pesticide poisoning 78(39%), next to that plant poisoning 55(28%) including yellow oleander, oduku leaves and abrusprecatoriu. Moreover, DSH common among young males 57% than females 43%[11]. However, in our study DSH common among young females 68.6% than males 31.4%.

Out of 121 poisoning patients, 33(27.3%) victims had ingested seeds of yellow oleander poison. Out of 33, majority 24 (72.7%) were female and 9 (27.3%) were males. Most of the study, conducted in Sri Lanka, India and Bangladesh where the higher suicidal rate was found among males than female [12, 13].

Majority of victims 11 (33.3%) were students. Most of cases 25(75.8%) were in the age group of 12-29 years and maximum cases were found between 12-19 years (15 cases, 45.5%) which can be explained by the fact that the persons of this age group are suffering from stress of the modern lifestyles, failure in love, family problems, nuclear family concept etc [12]. In this study, main reasons for the oleander poisoning were the confrontation with their parents and siblings. Love affair 10(30.3%) was the second. Least number of patients had a reason of failure in the exam.

When we consider the outcome of the oleander poisoning is vary with a different center. In our study three-fourth of the victims, 25(75.8%) were discharged without any complications. However, 2(6.1%) patients have died and 6(18.2%) were recovered from heart block. Non of the victims were required a temporary pacemaker. In cardiac effects, cardiac dysrhythmias such as bradycardia or an irregular pulse are the most common findings on examination. Changes in the ST segment in ECG and conduction blocks are noted with increasing severity.

In our study case fatality rates for yellow oleander poisoning was 6.06%, A study conducted in

the rural part of the Sri Lanka where fatality rate for DSH was 10.9% [14]. However, this pattern can vary between populations and over time, depending on the interplay between the causative agent of disease, the host and the environment as well as available treatments and quality of patient care [15] unfortunately, yellow oleander produces fruits throughout the year, irrespective of the dry and rainy seasons. This is the reason, yellow oleander poisoning cases were reported throughout the year, however incidence of poison slightly higher in may [16].

CONCLUSION

Deliberate self-harm is an important problem in the developing world. Ingestion of yellow oleander seeds (*Thevetia peruviana*) has recently become a popular method of self-harm in northern and eastern part of the Sri Lanka. These seeds contain cardiac glycosides that cause vomiting, dizziness, and cardiac dysrhythmias such as conduction block affecting the sinus and AV nodes. Yellow oleander causes bradycardia with varying degrees of heart block and hypotension. Although anti-digoxin antibodies are effective in neutralizing the effect of glycosides in kaneru, it is very expensive and hence not readily available. We have observed poisoning was common among productive age group (12-29 years) that produces a huge socioeconomic burden on the society. In future poison prevention strategies could be implemented at various levels.

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