Case Report

Mass Poisoning with *Jatropha curcas* - A Case Report

Ghodkirekar MSG,* Joshi VM,** Kantak MP, Perni S,*** Sapeco SD,*******

ABSTRACT

In India, accidental poisoning due to ingestion of plant seeds is common among children, especially under 12 years of age. It varies from relatively mild poisoning to fatal poisoning. Since unripe fruits of Yellow Oleander (Cerbera thevetia; Thevetia peruviana) resemble the fruits of Jatropha curcas, and symptoms such as vomiting, diarrhoea, and abdominal pain are common to both when ingested, differentiating the two is occasionally difficult. In this paper, the authors share their experience of a mass poisoning with Jatropha curcas that was initially mistaken to be due to Cerbera thevetia.

Key Words: *Jatropha curcas, mass poisoning*

Introduction

Acute poisoning is an important paediatric emergency, which is a global problem. It has been a subject of considerable study in various parts of the world such as the UK and the USA.[1] Accidental poisoning is common in toddlers due to their newly acquired independent mobility, innate curiosity, and predilection for exploring the environment with their mouth, eyes, and fingers, and an innate inability to differentiate the harmless from the harmful.[2] Mass poisoning with plant seeds is not uncommon, as plants are invariably accessible and attractive to young children for exploratory purposes. However, poisoning with the seeds of *Jatropha curcas* is not commonly mentioned in medical literature.

*Lecturer (*Corresponding author*),
***Assistant Lecturer,
****Professor, Dept of Forensic Medicine,
**Assistant Professor, Dept of Paediatrics,
Goa Medical College, Bambolim, Goa, India

The Case

Seventeen children varying in age from 3 to 11 years from an orphanage funded by an international organization were brought to the Paediatric ward of Goa Medical College with complaints of vomiting, pain in the abdomen, and loose stools. There was a history of consumption of the seeds of some plants that grew behind the orphanage about one to two hours prior to the onset of these symptoms. Each child on an average had consumed 3-9 seeds. Three of the 17 children were relatively asymptomatic. Among the remaining, abdominal pain was the predominant symptom (76%), followed by vomiting (71%). Three children had loose motions with mild dehydration. On examination, the vital signs were found within normal limits in all except for two who had mild dehydration.(**Table 1**). All children were subjected to an immediate gastric lavage. They were then treated symptomatically with intravenous fluids. All of them recovered and were discharged after 24 hours of observation. They were also followed up at hospital after 48 hours for any delayed effects. The caretaker of the orphanage brought a green unripe fruit of the plant from which children had consumed the seeds. She did not know the name of the plant, but informed the attending medical personnel that a number of yellow oleander plants (*Cerbera thevetia; Thevetia peruviana*) grew around the orphanage house. Based on this information, and the nature of the presenting symptoms, a diagnosis of oleander poisoning was made.

The faculty of the department of Forensic Medicine and Toxicology of Goa Medical College decided to pay a visit to the site of exposure to obtain the incriminating plants. At the site, as the caretaker had said, there was a profusion of yellow oleander plants all around. But there were also a number of plants of the species *Jatropha curcas*. Both plants were seen to bear unripe as well as

dry fruits that looked more or less similar to each other. When the affected children were asked to indicate the plants from which they had eaten the seeds, they pointed to *Jatropha curcas*! They said quite candidly that they had not consumed the seeds of yellow oleander since they knew that it was a poisonous plant! However they admitted that they were not aware that *Jatropha curcas* too was poisonous, as they had observed some local tribals using twigs of these plants as a dentifrice for brushing their teeth. They had consumed the seeds out of sheer curiosity. The exact identification of the plants was subsequently confirmed by sending the twigs, fruits, and seeds to the department of Botany of Goa University. The final diagnosis was now changed to "Poisoning due to *Jatropha curcas*."

Discussion

Jatropha curcas is a large, glabrous shrub belonging to family Euphorbiacea, with greenish white, smooth, bark that peels off in thin flakes. Leaves measure up to 15 mm in diameter, and are entirely or palmately lobed. Flowers are yellowish green in colour. The common names of the plant are Physic Nut (in English) and Ran Arandi, Mogali Arandi, Jangali Arandi, or Ratan Jot (in the local dialects).[3,4] Castor (*Ricinus communis*) is known as Arandi in the local language, and is also a medicinal plant like *Jatropha curcas*. The similar sounding terms "Arandi" and "Ran Arandi" can therefore lead to confusion. However the fruit of castor cannot be mistaken for jatropha, as it is covered with soft spines on the outer surface.[3] The unripe fruit as well as the dried fruit of *Jatropha curcas* (**Fig 1**) can however be confused with those of yellow oleander (**Fig 2**) even though a closer look will invariably highlight differences.[5] The leaves and flowers of these two plants are easily differentiated.

The black seeds of unripe Jatropha fruit are known in Philippines as "tuba-tuba," and are commonly (though inadvertently) ingested by children in that country. The seeds of *Jatropha curcas* contain a pale acrid oil, just like croton oil. It contains the active principle *curcanoleic acid*, and is used as a laxative. The oil is also applied to painful joints, and is said to have beneficial effects.[6] However, the crude oil when applied externally causes irritation, and when ingested causes severe diarrhoea. The seeds possess a toxalbumin named *curcin.*[7] In the case under discussion, there were complaints of vomiting, abdominal pain, and loose motions. Some other studies have listed additional complaints of muscle twitching, salivation, and sweating. Likewise, poisoning due to *Cerbera thevetia* (Yellow oleander) also presents with complaints of vomiting, abdominal pain, diarrhoea and giddiness, but will cause additional digoxin-like effects, which can lead to a fatal outcome. Just eight to ten seeds of oleander can be fatal.[8] Oleander is so toxic that deaths have been reported in children who have ingested a handful of flowers, and in an adult who mistakenly drank herbal tea prepared from oleander.[9] As compared to yellow oleander poisoning, jatropha poisoning is generally non-fatal, even though some deaths in lower animals have been reported.[10]

Singh LR et al in their study of accidental poisoning in Manipur reported an incidence of 12% due to poisonous fruits and seeds, and all were non-fatal cases.[2] Mass poisoning involving many children at a time is one of the commoner types of presentation in many reported cases.

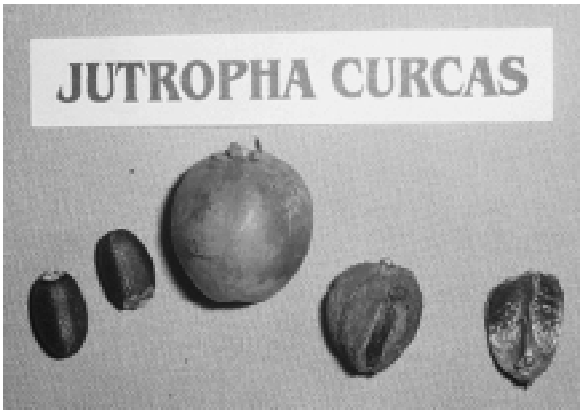

Fig 1

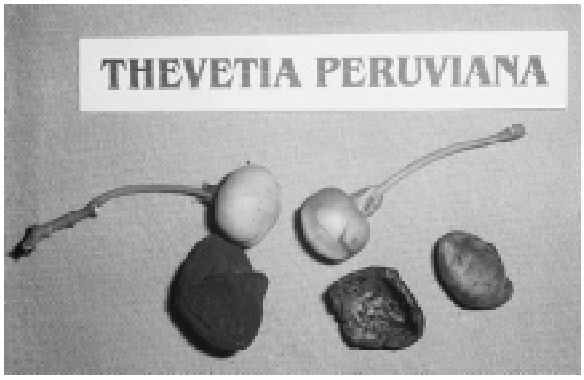

Fig 2

Kulkarni et al reported mass poisoning with *Jatropha curcas* in 20 children.[10] Historically, the Bombay Chemical Report for the year 1927 mentions a case where three children had consumed *Jatropha curcas* seeds, while in the 1940 report a case of mass poisoning involving five children is quoted. Pohonwala and Ghai reported 200 cases from Indore during the period 1952-1958.[5] In most of the reported cases, the victims were discharged within 24 to 48 hours after supportive therapy.

Conclusion

Jatropha seed oil is being tried as a bio-fuel in some parts of India. Hence, large scale plantations are being encouraged in these areas. There is therefore a likelihood of an increase in the frequency of accidental poisoning in the years to come. This makes it imperative for making more toxicological information available to physicians, especially those practicing in rural areas. There is also an urgent need for creating public awareness about such poisonous plants, and encourage the observance of safety precautions by caretakers of young children through dissemination of information.[11]

Acknowledgement

Children, staff and management of Bethesda Life Center, St. Cruz, Goa; Dr. Philomina D'Souza (Professor & HOD) and Dr. (Mrs) M. P. Silveira (Assoc Professor), Dept. of Paediatrics, Goa Medical College; Mr. M. K. Janarthanan, Reader, Dept. of Botany, Goa University; Photography Section, Goa Medical College; and Mr. Shaikh Azizur Rehman, South Asia Correspondent for Washington Times.

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