



Case Series

***Jatropha curcas* poisoning in six children: A case series**

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Abstract

Jatropha curcas, is a large shrub, belongs to the Euphorbiaceae family. The plant is widely distributed in the wild and semi-cultivated areas of India, South East Asia, Central and South America and Africa. There are number of studies have shown the seed component to be toxic and lethal in lower animals. There are only a few case reports on this plant showing some features about its toxicity in human. There are no reported deaths associated with its consumption. All the reported cases belong to paediatric age group and which happens by accidental manner. Its seeds contain a toxalbumin, curcin, which is very less potent than ricin. Seed oil also contains curcanoleic acid or Jatrophin which can cause hepatotoxicity. We are reporting six cases of *Jatropha curcas* poisoning in children who consumed the seeds thinking as peanut.

Keywords: *Jatropha curcas*, Purging nut, Antidote, Biofuel.

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1. Introduction

Jatropha curcas, (Physic nut) is a large shrub, belongs to the Euphorbiaceae family.¹ The name is derived from Greek words (iatros = physician and trophe = nutrition), hence the common name physic nut.² The plant is widely distributed in the wild and semi-cultivated areas of India, South East Asia, Central and South America and Africa.^{2,3} The other common names of *Jatropha curcas* are Jungle Erandi, Ratanjot, Bagrandia,¹ purging nut tree and Barbados nut tree.³ *Jatropha* are fruit bearing plants and the seeds have a pleasant taste, the plants are extremely attractive to children.² Each parts of plant are poisonous however the seeds have the highest concentration of the toxin.^{4,5} The toxin of the plant is the toxalbumin and are curcin³ and cyanic acid, related to ricinoleic acid.^{4,5} There are several studies which have found it to be toxic but not lethal in humans, however ample number of studies have shown the seed component to be toxic and lethal in mice, rats, chicken, calves, sheep and goats. From our literature search we could find only a few cases of *Jatropha curcas* poisoning from India, South Africa and

some other places. All these reported cases are of paediatric age group. We could not find any report of poisoning in adults. The plant is also used for medicinal purposes in human. In Homeopathy, it is used for cold sweats, colic, cramps, diarrhoea etc.² The yellow oil (Hell oil) is extracted from the seeds and is used for many medical conditions like eczema, herpes, indolent ulcers and chronic rheumatic pain.² *Jatropha curcas* is used as laxative, antiparasitic, antidote for snake venom and vermifuge.³ It is also widely used as bio-fuel.⁶ Eventually with increase in cultivation of *Jatropha curcas* mainly in Saurashtra region of Gujarat for its use as bio-fuel, there is likelihood of increase in the accidental poisoning and therefore it is essential for the medical fraternity to publish more *Jatropha curcas* poisoning cases to gather the epidemiological data, signs and symptoms and treatment of *Jatropha curcas* poisoning. Considering the facts, we are reporting six cases of *Jatropha curcas* poisoning in children who consumed the seeds thinking as peanut.

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2. Case Reports

Seven children with age ranging from 2 years to 14 years were playing near a jungle area near to their village in the district of Khordha (Odisha). They encountered a plant bearing green coloured fruits. Out of curiosity, they opened the ripe fruit (**Figure 1**) and broke the black coloured seed (**Figure 2**) where they found peanut like substance. Mistaking for peanuts, all the seven children consumed around 10 - 20 seeds of that fruits. Within 1 hour of the consumption, 5 children started developing similar types of symptoms. (**Table 1**) Initial complaint was vomiting, which was non-projectile, non-bilious followed by abdominal pain which was present diffusely over the epigastric and periumbilical region seen in four children. Diarrhoea was observed in 2 cases. In all the cases, the symptoms were transient and self-resolving. All the cases were observed for 48 hours. Blood investigations revealed elevated ALP (Alkaline phosphatase) in 2 of the 7 cases. There was neutrophilic leucocytosis in same 2 of 7 children who had elevated ALP. All other parameters including Haemoglobin, Platelet counts, renal function test and liver function test were within normal limits. All the cases managed with IV fluid, antiemetics and ORS and discharged after 48 hours of admission.



Figure 1: Seeds recovered from the site



Figure 2: One single seed

Table 1:

Parameters	Case 1	Case 2	Case 3	Case 4	Case 5	Case 6
Age	2	6	7	12	14	14
Sex	Male	Male	Female	Male	Male	Male
Religion	Muslim	Muslim	Muslim	Muslim	Muslim	Muslim
Time of ingestion	12PM	12PM	12PM	12PM	12PM	12PM
Number of seed consumed	1 seed	8 seeds	20 seeds	10 seeds	12 seeds	20 seeds
Time of first symptom	No symptoms	1 pm	1 pm	1 pm	1 pm	1 pm
Symptoms in chronological order	No symptoms	2 episodes of vomiting followed by 2 episodes of diarrhea	3 episodes of Vomiting followed by Abdominal pain (Epigastric and periumbilical region)	3 episodes of vomiting followed by abdominal pain (periumbilical region)	7 episodes of vomiting followed by abdominal pain (Epigastric and periumbilical region)	By 6 episodes of vomiting followed by abdominal pain (Periumbilical region) and 2 episodes of diarrhea.
Resolution of symptoms	NIL	Within 6 hours	Within 6 hours	Within 6 hours	Within 6 hours	Within 6 hours
CBC	Normal	Normal	Normal	Normal	Normal	Normal
RFT	Normal	Normal	Normal	Normal	Normal	Normal
LFT	Normal	ALP elevated	ALP elevated	ALP elevated	ALP elevated	ALP elevated

3. Discussion

Jatropha curcas commonly called as Jahazigaba, Dhalajahaji in Oriya belongs to Euphorbiaceae family.¹ It is a perennial poisonous shrub which can grow up to 5 meters. It is an uncultivated plant that originated from Central America² and is present in almost all states of India.¹ The leaves are entirely or palmately lobed. Each plant contains many flowers, yellowish green in colour and green coloured fruits. Each fruit contains about three to four black coloured seeds. It is known by many other common names like Purging nut, Physic nut, Barbados nut, Curcas nut. It is also cultivated in some areas like Gujarat for its potential use in biodiesel production.^{1,4,6} The seeds are also used in villages for the treatment of cold sweats, colic, cramps, constipation.^{7,8} The increase in cultivation of *Jatropha curcas* in the rural areas has probably increased the incidence of accidental poisoning in children.³ There are only a few case reports on this plant showing some features about its toxicity. The seeds of *Jatropha curcas* resemble that of *Ricinus communis* in shape and are black in colour.⁸ *Jatropha curcas*' seeds contain a toxalbumin, curcin,⁷ which is very less potent than ricin found in the seeds of *Jatropha Multifida*. Seed oil also contains curcaneleic acid or Jatrophin which can cause hepatotoxicity⁸ which explains the rise in serum ALP. The purgative effect is caused by the diterpenoids and curcaneleic acid which is present in the seed oil.^{7,8} However, there are no reported deaths associated with its consumption. All the reported cases belong to pediatric age group and which happens by accidental manner.^{9,1} The black colour seed of this plant if broken, contains peanut like particles which are often mistaken by the children. Since it is easily accessible to children,¹¹ accidental poisoning can happen which makes it necessary to know more about the effects of this poison. Koltin et al reported that miosis is also a presenting sign of *Jatropha* intoxication.¹² The combination of vomiting, diarrhoea and miosis resembles the organophosphorus compound poisoning.¹⁻¹² In our cases, the features of eye are unremarkable. There are no signs of pupillary constriction. The content of poison in the seeds are still not known. Those who consumed more than two seeds irrespective of ages were affected by symptoms. The exact toxic dose is not clearly known.⁹ The adverse effects following consumption of seeds include vomiting, diarrhoea, abdominal pain and burning sensation in the throat. Acute abdominal pain is experienced about a half hour after the ingestion of the seeds. The feature of throat pain was not observed in our case. Though it is believed that roasting the seeds detoxifies it, but toxicities have been reported even after consumption of roasted seeds.⁹ Treatment is essentially symptomatic and supportive. Confirmed cases which are mostly history related are managed and treated symptomatically.¹¹ In cases of ingestion of seed, and if the patient is conscious gastric lavage can be done or emesis can be induced with Ipecac syrup within 1-2 hours of ingestion.⁹ There is no specific antidote for this toxalbumin.¹ Kosam A mentioned in their research article

that most of the poisoning cases were discharged less than or equal to 24 hours and is probably due to mild poisoning. *Jatropha curcas* ingestion could cause severe gastrointestinal symptoms, it is not associated with major morbidity or mortality. In our case series, all patients, those have symptoms, they are treated symptomatically. All the gastrointestinal component becomes normal within 6 hours and the hepatic components become normal within 48 hours. There were no changes in the haematological and renal parameter. All are discharged after 48 hours of treatment and observation.

4. Conclusion

This case report highlights the importance of lack of awareness and need for further study about *Jatropha curcas*. Educating young children regarding edible fruits and differentiating them from locally grown toxic shrubs, their flowers, seeds and fruits should be included as a component of non-formal education. Pre-school children may be shown photographs to identify potential toxic plants growing in the community and taught to refrain from playing near them. More such case reports can add to the existing knowledge of treating poisoning from accidental ingestion of unknown fruits and substances. Though there are no established cases of death due to its poisoning, it has been observed that it is fatal in lower animals like rats and mice. Therefore, this plant irritant poison should not be taken lightly.

5. Source of Funding

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6. Conflict of Interest

None.

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