Case Report

Jatropha curcas Poisoning

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Five persons including two adults presented with vomiting and abdominal pain within an hour of ingesting Jatropha seeds. They underwent gastric lavage and received IV fluids, and all recovered rapidly. Euphorbol esters are the major toxin. Fatality has not been reported in human beings, but is common in animals.

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This report of 3 children and 2 adults with Jatropha curcas poisoning discusses recent information on the toxicity of Jatropha. As this shrub is today being actively cultivated and investigated as a possible source of bio-fuel, the incidence of accidental poisoning is likely to increase in the future.

Case Report

Three children aged 3, 5 and 8 years and an adult aged 22 were brought to the hospital with the complaint of vomiting and abdominal pain after ingesting some seeds. The adult discovered that the seeds tasted sweet, so she ate about ten of them and also gave a few seeds (number unknown) to the neighbouring children. They all started vomiting within an hour.

On admission all four of them had vomiting and two had abdominal pain. The 8 year old child had loose stools too, and her vomiting was severe, and she was dehydrated and looked toxic. The others looked well. None of them had fever. The general examination was normal; the pupils were normal in size.

All of them underwent gastric lavage, which brought out partially digested seeds. IV fluids were administered to all, though only the 8 year old girl had significant dehydration. Four hours later all of them had dinner, though this resulted in mild vomiting in the 8 year old. The next morning all of them were totally asymptomatic, and were discharged.

A 35 year old woman confessed that she too had eaten a seed, and she was kept under observation but did not undergo stomach wash as she was totally asymptomatic.

A botanist examined the leaves, fruit and seeds, and identified it as Jatropha curcas.

Discussion

This ubiquitous shrub is known as purging nut in English, Jungli erandi in Hindi and Kammatti in Malayalam. It has smooth green multi-lobed leaves and small yellow flowers. The green ovoid fruit becomes an attractive yellow on ripening; it has three black seeds (Fig 1). The seeds, leaves and latex are used for a wide variety of medical purposes in traditional systems of medicine the world over[1]; in Ayurveda the seeds are used for their purgative effect to manage constipation, haemorrhoids and worms.

The seeds are rich in oil, which can be extracted and added to diesel or used by itself as fuel, and its economic viability as a possible bio-fuel of the future is being investigated in India and some African countries. Jatropha may be an ideal candidate for bio-fuel as it is easy to grow even on wasteland, is drought- and pest-resistant, and is not a food crop (unlike corn and sugarcane). If it proves feasible, large-scale commercial cultivation may increase the incidence of accidental poisoning in the future. Profitability can be increased if the seedcake residue after oil extraction can be detoxified and used as an animal or human feed: this consideration has led to intensive research on its toxicity.

Fig 1— (A) Leaves of Jatropha curcas. (B) green ovoid fruit. (C) black seeds in the palm of the hand

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Contrary to most reports in the medical literature, the most potent toxins are its phorbol esters; Jatropha curcas strains that are low in them are safe for human consumption despite the presence of other toxins like curcin[2,3]. Not only do phorbol esters cause gastrointestinal symptoms but they stimulate Protein Kinase C (PKC). PKC is involved in signal transduction in most cells, and this brings about a wide range of biochemical and cellular effects[4], resulting in widespread tissue damage and lung hemorrhage, often leading to death in animals. Curcin, a ribosome-inactivating protein which was formerly believed to be highly toxic, is probably of little importance. Curcanoleic acid, a strong purgative found in the oil, is important for the immediate gastrointestinal toxicity. Ricin toxin is not present in Jatropha species.

Fatal poisoning is not reported, which is why Jatropha curcas poisoning is sparsely reported in medical journals[5-8] and in textbooks of toxicology and forensic medicine. Occasionally there may be severe vomiting, hemorrhagic diarrhoea and dehydration. Most case reports are similar to this one: mild-to-moderate vomiting and abdominal pain and loose stools occurring within an hour of ingestion, with response within hours to gastric lavage and correction of dehydration. However one should be cautious as poisoned animals manifest weight loss, glomerular sclerosis, myocardial and hepatic damage, lung hemorrhage etc. which may be fatal[4].

Unlike Jatropha curcas, Jatropha multifida has once been reported to cause miosis, raising confusion with organophosphorus poisoning[9].

As with all cases of accidental poisoning, cases involving adults are rare[5]. Accidental poisoning is usually caused by curiosity: in this case a branch of the tree was cut down, and the 22 year old picked up the ripe fruit and tasted the seeds, which tasted like almonds.

Management is symptomatic. Despite the vomiting, gastric lavage usually brings out additional undigested material. Dehydration should be corrected aggressively. Activated charcoal has been used. One should watch for systemic involvement. Prognosis is excellent.

Conflict of Interest : NIL

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