

Abrus precatorius Poisoning: A Retrospective Study of 112 Patients

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Abstract

Abrus precatorius is a rare but important cause of plant poisoning, especially in tropical countries like India. Most of the published literature on *Abrus* is limited a few case reports. Hence, we did a retrospective study the clinical features and outcome of *Abrus* poisoning. Case records of patients admitted to medicine wards during 7 years were included in the study. A total of 112 patients were studied. The majority were females (78%), and most of the patients were between 13 and 30 years (81%). Diarrhea was the most common symptom (66%), and blood in stools was present in (33%). Six patients had died with a mortality rate of (5.35%).

Keywords: *Abrus precatorius*, case series, India, poisoning

INTRODUCTION

Abrus precatorius (known as kundumani in Tamil) is a poisonous plant which contains one of the most lethal toxin, Abrin, a toxalbumin that inhibits protein synthesis causing cell death.^[1,2] The seeds are crushed and taken orally for suicidal purpose. Most of the patients are from rural areas since this plant is predominantly seen in villages. There is no antidote for this poisoning.

Clinical features commonly include nausea, severe vomiting, diarrhea, abdominal pain, and gastrointestinal bleeding.^[3,4]

Diarrhea can occur after 3–4 days of ingestion^[5] and can be profuse. This can cause death due to severe volume loss.

Other uncommon features include encephalopathy, arrhythmias, and renal failure due to volume depletion.^[5,6]

A. precatorius is an uncommon cause of poisoning reported mainly from Southern parts of India, which is restricted only to individual case reports.^[3,4,6-11] Hence, this study was undertaken to document the clinical features and outcome of *A. precatorius* poisoning.

SUBJECTS AND METHODS

This was a retrospective study of case records of patients (age >13 years) admitted to medicine wards over a period of 7 years (January 2009–December 2015). Institute Scientific

Committee and Ethics Committee approvals were obtained. A pro forma was used to collect data regarding the age, sex, duration of hospital stay, number of seeds consumed, form of ingestion, symptoms, complications and the outcome.

RESULTS

We studied a total of 112 patients admitted due to *A. precatorius* poisoning. Most of the patients were females (78.7%). Most of the patients (81%) were between 13 and 30 years of age, with 41.6% between 13 and 20 years of age. The duration of hospital stay ranged from a single day to a maximum of 9 days, most of the with a stay duration of a single day (44.25%). The most common form of ingestion was crushed seeds (58.40%).

Majority of the patient presented with gastrointestinal symptoms (72.57%) in the form of loose stools, vomiting, and pain abdomen [Table 1]. Bloody diarrhea was present in 29.4%. Neurological involvement in the form altered sensorium, tremors, and seizures were present in 9 patients. Sixteen patients (14%) did not have any features of toxicity.

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Of the 112 patients, six patients expired [Table 2] and the rest recovered. All the six patients had taken a handful of crushed seeds and developed symptoms within 12 h. All of them had profuse bloody diarrhea and autopsy showed congestion of the viscera, especially the lungs and intestines.

DISCUSSION

A. precatorius contains Abrin one of the most lethal toxin with an estimated human lethal dose of 0.1–1 µg/kg. Abrin is a ribosome inactivating protein which is similar to ricin, diphtheria toxin, and pseudomonas toxin. Abrin has two chains – A and B. the B chain binds to β-D-galactopyranoside moieties on the cell surface and facilitates the entry of A chain. The A chain has RNA-N-glycosidase activity, causing depurination of adenine in the 28 S rRNA. This prevents the binding of elongation factor to the rRNA resulting in complete inhibition of RNA translation.^[1,2]

The classical feature of *Abrus* toxicity is bloody diarrhea. Mechanisms of diarrhea have been attributed to increased capillary permeability (vascular leak syndrome), direct irritant

and denudation of intestinal mucosa.^[12] Endoscopy and colonoscopy show friable and ulcerated mucosa.^[3,4] Although diarrhea was present in 72.57% of our patients, only 29% had bloody stools. Diarrhea was often self-limiting and recovered with fluid support.

Neurological involvement is uncommon. These include encephalopathy, seizures, cortical thrombosis, and tremors.^[6,7,9-11] Nine patients had neurological involvement and magnetic resonance imaging brain done in one patient was normal.

All the six patients who died had taken crushed seeds. Autopsy showed congestion of the internal organs predominantly of the lungs, heart, and intestines.

Limitations

This was a retrospective study, and detailed histopathological analysis could not be carried out.

CONCLUSION

We report the largest series of *Abrus* poisoning with a mortality rate of 5.35%. We hope that this study will be of use to physicians who care for these patients.

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Conflicts of interest

There are no conflicts of interest.

REFERENCES

- Gadadhar S, Karande AA. Abrin immunotoxin: Targeted cytotoxicity and intracellular trafficking pathway. *PLoS One* 2013;8:e58304.
- Narayanan S, Surendranath K, Bora N, Surolia A, Karande AA. Ribosome inactivating proteins and apoptosis. *FEBS Lett* 2005;579:1324-31.
- Khanra D, Talukdar A, Basu K, Mitra S. *Abrus precatorius* poisoning leading to hemorrhagic gastroenteritis – A rare experience. *J Forensic Toxicol Pharmacol* 2014;3:1.
- Ganesan R, Ettiyar R. *Abrus precatorius* induced hemorrhagic colitis. *Am J Pharmacol Toxicol* 2015;10:40-5.
- Davies JH. *Abrus precatorius* (rosary pea). The most common lethal plant poison. *J Fla Med Assoc* 1978;65:188-91.
- Patil MM, Patil SV, Akki AS, Lakhkar B, Badiger S. An arrow poison (*Abrus precatorius*) causing fatal poisoning in a child. *J Clin Diagn Res* 2016;10:SD03-4.
- Sahoo R, Hamide A, Amalnath SD, Narayana BS. Acute demyelinating encephalitis due to *Abrus precatorius* poisoning – Complete recovery after steroid therapy. *Clin Toxicol (Phila)* 2008;46:1071-3.
- Pillay VV, Bhagyanathan PV, Krishnaprasad R, Rajesh RR, Vishnupriya N. Poisoning due to white seed variety of *Abrus precatorius*. *J Assoc Physicians India* 2005;53:317-9.
- Subrahmanyam D, Mathew J, Raj M. An unusual manifestation of *Abrus precatorius* poisoning: A report of two cases. *Clin Toxicol (Phila)* 2008;46:173-5.
- Sahni V, Agarwal SK, Singh NP, Sikdar S. Acute demyelinating encephalitis after jequirity pea ingestion (*Abrus precatorius*). *Clin Toxicol (Phila)* 2007;45:77-9.
- Vinod KV, Thabab MM, Venkatesh T, Thiruvikramaprakash G, Kumar SR, Dutta TK. A rare cause of dural venous sinus thrombosis. *Neurol India* 2013;61:669-70.
- Dickers KJ, Bradberry SM, Rice P, Griffiths GD, Vale JA. Abrin poisoning. *Toxicol Rev* 2003;22:137-42.

Table 1: Signs and symptoms of *Abrus precatorius* poisoning

	Number of patients (%)
Gastrointestinal	82 (72.57)
Vomiting	52 (46.02)
Loose stools	68 (60.18)
Blood in stools	33 (29.20)
Abdominal pain	8 (7.08)
Fever	4 (3.54)
Neurological	10 (8.85)
Altered sensorium	4 (3.54)
Seizures	4 (3.54)
Tremors	2 (1.77)
Cardiovascular	2 (1.77)
Renal (decreased urine output)	1 (0.88)
Asymptomatic	16 (14.16)

Table 2: Details of patients who died from *Abrus precatorius* poisoning

Age/sex	Number of seeds	Time between intake and death (days)	Cause of death
25/female	50 crushed seeds	4	Pulmonary edema
30/female	Handful crushed seeds	7	Refractory shock
20/female	20 crushed seeds	7	Massive hemoptysis
20/female	Handful crushed seeds	4	Diarrhea, shock
30/female	20 crushed seeds	4	Diarrhea, shock
46/male	Handful crushed seeds	2	Diarrhea, shock