

## CASE REPORT

# Curcin Intoxication in Royal Thai Army Privates: A Case Series

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## Abstract

**Background:** *Jatropha curcas*, commonly known as “Saboo Dum,” is the most common plant poisoning in Thailand. Saboo Dum seeds are used as raw material for biodiesel fuel manufacture, especially in Royal Thai Military units. The seed contains a toxin called curcin which can cause hepatotoxicity in humans.

**Case Presentation:** We reported twenty-eight private soldiers who were brought to the emergency department with gastrointestinal symptoms after having been ingested Saboo Dum. Four patients had mild elevated liver function test ( $56.25 \pm 7.38$ ). In our case series, gastrointestinal symptoms were predominant symptoms (nausea and vomiting 96.4%, diarrhea 78.6% and abdominal pain 50%). All patients discharged from hospital without any complications.

**Discussion:** Curcin can cause hepatotoxicity similar to ricin but less potent than ricin which may explain the clinical manifestations in our patients.

**Conclusion:** As the lack of awareness of Saboo Dum poisoning is the major cause of intoxication, knowledge of this seed may play an important role in the reduced incidence of curcin poisoning.

**Keywords:** *Jatropha Curcas*; Saboo Dum; Thailand

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## INTRODUCTION

*Jatropha curcas* or “Saboo Dum” in Thailand is a plant in the family *Euphorbiaceae* which is commonly found in Thai military units, because this seed is used as raw material for biodiesel fuel production. According to reports from Ramathibodi Poisoning Center, curcin poisoning is the most common plant poisoning in Thailand and cases of Saboo Dum poisoning have been reported due to ingestion of the seed of this plant (1). Majority of patients had only gastrointestinal symptoms. Children younger than 13 years old are especially vulnerable to it. The Saboo Dum seed contains toxalbumins called curcin which cause gastrointestinal symptoms and hepatotoxicity in humans by inhibiting cellular protein synthesis (2). The clinical manifestations of curcin poisoning consist of nausea, vomiting, abdominal pain, diarrhea and hepatitis. We wish to share our experience of clinical manifestations and outcome of mass curcin toxicity in 28 private soldiers who were brought to the emergency department of Phramongkutklao Hospital.

## CASES PRESENTATION

Twenty-eight private soldiers were brought to the emergency department of Phramongkutklao Hospital, Thailand on December 23, 2016 with complaint of gastrointestinal symptoms after ingestion of Saboo Dum seeds.

The number of seeds consumed was 3–30. Nausea and vomiting were dominant symptoms (96.4%). 78.6% of cases had diarrhea and abdominal pain was found in 50% of cases. All of the patients were male and 21 years old. Blood serum electrolytes, serum creatinine and blood urea nitrogen were normal on the admission day and mean values of AST and ALT were  $29.32 \pm 2.45$  U/L and  $27.78 \pm 4.48$  U/L, respectively.

AST (Aspartate Aminotransferase), ALT (Alanine Aminotransferase), BUN (blood urea nitrogen), Cr (creatinine), Na (serum sodium), K (serum potassium), Cl (serum chloride),  $\text{HCO}_3$  (serum bicarbonate)

From the laboratory findings (Table 2), we found 4 patients had mild elevated liver function test. Patient number 1, ingested 20 seeds of Saboo Dum, presented with nausea, vomiting and abdominal pain. His initial laboratory results were elevated AST (67 U/L) and elevated ALT (102 U/L). He was admitted for 4 days and treated symptomatically by receiving intravenous fluid and antiemetic drug. He was taken blood sample for following-up daily. His daily AST results were 36, 51 and 48 mg/dL and his ALT results were 102, 101 and 112 U/L, respectively. He had no symptom on dispositioning. Patient number 2, ingested 5 seeds, presented with nausea and vomiting. His initial laboratory results showed slightly elevated AST (U/L) without elevated ALT. He was admitted for 3 days and treated symptomatically. Patient number 3, ingested 10 seeds, presented with nausea,

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vomiting and diarrhea. His initial laboratory results reviewed elevated AST (70 U/L) and elevated ALT (94 U/L). He was admitted for 3 days and treated symptomatically. Patient number 4, ingested 10 seeds, presented with nausea, vomiting, abdominal pain and diarrhea. His initial laboratory results had elevated AST (49 U/L) and elevated ALT (80 U/L). He was admitted for 2 days and treated symptomatically as well as other cases. All patients fully recovered without any sequelae or complications.

**Table 1.** Laboratory findings of patients (on admission) and demographic data

N = 28	
Age (mean)	21
Sex	Male (100%)
Amount of seeds ingested (min - max)	3 – 30
Clinical manifestations	
Nausea and vomiting	96.4%
Diarrhea	78.6%
Abdominal pain	50%
Laboratory findings	
	Mean±SE
AST (U/L)	29.32±2.45
ALT (U/L)	27.78±4.48
BUN (mg/dL)	11.5±0.4
Cr (mg/dL)	0.9±0.02
Na (mEq/L)	142±0.2
K (mEq/L)	3.7±0.05
Cl (mEq/L)	103.2±0.49
HCO <sub>3</sub> (mEq/L)	22.3±0.35

**Table 2.** Information of patients with abnormal liver enzyme

Patient number	No. of seeds ingested	Symptoms	Laboratory findings (U/L)	Length of stay (days)	Treatment
1	20	Nausea, vomiting, abdominal pain	Elevated AST/ ALT (AST=67, ALT=102)	4	Intravenous hydration and antiemetic drug
2	5	Nausea, vomiting	Elevated AST (AST=39)	3	Intravenous hydration and antiemetic drug
3	10	Nausea, vomiting and diarrhea	Elevated AST/ALT (AST=70, ALT=94)	3	Intravenous hydration and antiemetic drug
4	10	Nausea, vomiting, abdominal pain and diarrhea	Elevated AST/ALT (AST=49, ALT=80)	2	Intravenous hydration and antiemetic drug

**Table 3.** Summary of *Jatropha curcas* toxicity in literature

Name of the author	No. of patients	Age of patients (years)	No. of seeds ingested	Clinical manifestations (%)
Shah et al., 2010(6)	5	13-38	1-3	Nausea and vomiting (100%), abdominal pain (100%), diarrhea (100%)
Chomchai et al., 2011(4)	75	2-14	1-20	Nausea and vomiting (100%), abdominal pain (100%)
Singhal et al., 2013(5)	8	3-12	3-10	Nausea and vomiting (100%), diarrhea (0%)

## DISCUSSION

We also found no direct correlation between the number of seeds ingested and the severity of liver injury in our patients. The patient in our report ingested up to 30 seeds with no liver injury. The early symptoms were nausea and vomiting followed by abdominal pain and diarrhea. The recovery was quick. All patients discharged from hospital without any sequelae or complications.

Since it was commonly found in many Royal Thai Military units and potential for systemic toxicity, knowledge of this seed may play an important role in the reduced incidence of curcin poisoning.

## LIMITATIONS

A specific limitation in our study is the accuracy of the patient history, which may add error. Unfortunately, we are unable to perform pharmacokinetic study of curcin due to lack of available laboratory testing for this toxin.

## CONCLUSION

Base on this case series, most symptoms of curcin poisoning were gastrointestinal symptoms. Hepatitis can be occurred. *Jatropha curcas* (Saboo Dum) is used as raw material for biodiesel fuel production and commonly found in many places in Thailand. Awareness and knowledge of this seed may play an important role in the reduced incidence of curcin poisoning.

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