



Stink Bug Intoxication: A Case Series

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ABSTRACT

Consumption of insects as food is called entomophagy. The stink bug is consumed as food in some parts of the world. In Arunachal Pradesh (a northeastern state of India), the stink bug is consumed as a local delicacy in some parts, and some experience intoxication after consuming them. In this case series of 28 patients, we noted that stink bug intoxication mainly affects the central nervous system with transient impairment of motor coordination, cognition, and movement disorders. Symptomatology and clinical findings are suggestive of possible neurotoxicity of the insect due to which the safety and hygiene of consuming stink bugs are questionable.

Keywords: Tari, Gandhi phuk, Stink bug, Intoxication, Neurotoxin

INTRODUCTION

In many parts of the world, insects are consumed as food which is referred to as entomophagy. Over 1000 species of insects are known to be eaten in 80% of the world's nations [1]. In Arunachal Pradesh (Northeastern state of India), consuming stink bugs is a common culture in some parts. Here locally stink bug is known as Tari or Gandhi Phuk (Figure 1). The most abundant of the collected species of stink bug in Arunachal Pradesh is the *Coridius nepalensis* and *C. singhalanus* [2]. The less abundant is the *C. chinensis* [2]. They are found abundantly during winters starting from late October to November in the dry stony river bed and are commercially available in the local markets (Figure 1). Various tribes have their recipes [3]. Many seek medical treatment, after experiencing various toxicities during the season. Literature review shows various scant publications addressing the toxicity and clinical profile except for some allergic reactions due to contact with the insect [4]. Here we discuss a series of 28 cases of stink bug intoxication and their clinical profile.



Figure 1 Stink bug in Arunachal Pradesh

METHODS

Patients admitted to the Medicine Ward of Tomo Riba Institute of Health and Medical Sciences, Naharlagun (tertiary referral center), presenting with symptoms after consuming stink bugs were included in the study. Cases were collected from November 2019 to December 2022. Those with concomitant intoxication to alcohol or any other substance and those with any chronic ailments were excluded. All of them were managed symptomatically and their clinical and biochemical profile were noted.

CASE PRESENTATION

A total of 28 cases were included after meeting the inclusion criteria, out of which 16 of them were males (57%) and 12 of them were females (43%) with a male: female ratio of 1.3:1. The mean age of the subjects was 32.8.

It was noted that symptoms usually appear 4-6 hours after consuming the stink bug. The common presenting symptoms (expressed by patients) noted were 1) vertigo (most common) 2) tremors 3) vomiting 4) diarrhea 5) brain fog and 6) disorientation (Table 1).

Table 1 Common clinical presentation/symptoms of stink bug intoxication

Symptoms	Total patients
Vertigo	25 (89%)
Tremors	23 (82%)
Vomiting	18 (64%)
Brain fog	8 (28%)
Diarrhoea	3 (10%)
Altered sensorium	2 (7%)
Urinary retention	1 (3%)

Vertigo was the commonest presenting complaint and occurred in 25 patients (89%) which was of moderate to severe intensity, precipitated by opening the eyes and on movements. They prefer to lie still with closed eyes. Vertigo usually lasts for more than 3 days and in 2 patients it continued for more than 3 weeks.

The tremor was the second most common complaint after vertigo and occurred in 23 patients (82%). They present with coarse tremors which are bilaterally symmetrical and are present both at rest and on movement. They have impaired motor coordination due to which they have difficulty in moving around and doing simple tasks.

18 patients (64%) had vomiting which was more severe at the onset of symptoms and then gradually subsided, vomitus containing partially digested food materials. It was also noted that vomiting tendencies were more prominent in those having severe vertigo.

Brain fog, described by the patient as a lack of clarity/mental fuzziness was noted in 8 cases (28%) and most of them were associated with severe vertigo. It was not the presenting symptom but was expressed by the patients on inquiry after their full recovery.

3 patients (10%) had diarrhea lasting 2-3 days which was watery without mucus or blood.

2 patients (7%) were brought with altered sensorium, attendants describing them as not opening their eyes and not talking/responding to them. Clinical examination didn't show neck rigidity or signs of raised intracranial tension. They localized painful stimuli with the incomprehensible verbal response and no voluntary eye-opening. Symptoms lasted for more than 1 week. Vertigo and tremors were prominent and lasted longer in these patients even after they were fully oriented. They had a prolonged hospital stay of 2-3 weeks. Brain scanning of the two patients didn't show any abnormality.

1 patient developed urinary retention on the 2nd day of admission and had to be catheterized.

On examination, the commonest clinical finding was tremors seen in all the 28 patients (100%), which were present at rest and on movement and bilaterally present (Table 2). They had impaired motor coordination with difficulty in performing simple tasks. Acute dystonia involving the eyelids with excessive blinking and bilateral involuntary spasms of orbicularis oculi muscle was noted in 10 patients (35%). Horizontal nystagmus of both eyes was seen in 19 patients (67%), more pronounced in those who had severe vertigo. Tachycardia was noted in 20 patients (71%). Impaired cognition was noted in 2 patients (7%).

Table 2 Common clinical findings in stink bug intoxication

Clinical findings	Total patients
Tremors	28 (100%)
Impaired motor coordination	28 (100%)
Tachycardia	20 (71%)
Nystagmus	19 (67%)
Acute dystonia involving eyelids	10 (35%)
Impaired cognition	2 (7%)

Laboratory Profile

Mild Leucocytosis was seen in 4 patients (14%). Mild Thrombocytopenia was noted in 3 patients (10%). Electrolyte imbalance mainly mild hyponatremia and mild hypokalemia were noted in 6 patients (21%) who also had multiple vomiting episodes. All these derangements were transient and normalized after a few days.

Management of the Patients

All the patients were managed symptomatically. They recovered from the symptoms and signs and were discharged in stable condition except for the two patients who had altered sensorium, who continued to have mild vertigo and tremors even at the time of discharge.

DISCUSSION

Insects are consumed as food by various ethnic groups in several countries in Central and South America, Oceania, Asia, and Africa [5]. In parts of Arunachal Pradesh (Northeastern state of India) stink bug is consumed, locally known as Tari or Gandhi Phuk which is found mostly in the stony river beds during winter. The most abundant of the collected species of stink bug in Arunachal Pradesh is the *Coridius nepalensis* and *C. singhalanus*. The less abundant is the *C. chinensis* [2]. In Africa stink bug is widely consumed and it is a nutrient and antioxidant-rich food containing high amounts of proteins, fats, and phosphorus [6]. The author couldn't find publications on stink bug intoxication except for some case reports of contact dermatitis⁴ and contact keratitis due to contact with stink bug [7]. A case presenting with severe vertigo, vomiting, and acute kidney injury after consuming a stink bug is reported from Sikkim [8]. We collected 28 cases of stink bug intoxication and noted that symptoms appear 4 hours-6 hours after consuming the insect. The males and females were equally affected. The symptomatology and clinical findings suggest bizarre involvement of the Central Nervous System (CNS) with impaired motor coordination, hyperkinetic movement disorders (tremors and acute dystonia), and cognitive impairment (brain fog, altered sensorium). They also present with severe vertigo, vomiting, and nystagmus suggesting involvement of the vestibular system. Gastrointestinal involvement has also been noted with patients having diarrhea. Laboratory derangements were mild and transient. The symptomatology and clinical findings suggest probable neurotoxicity of the stink bug. The hygiene in collecting and consuming the stink bug is also questionable which may lead to probable food poisoning. The stink bugs are known to produce blends of odoriferous compounds that serve mainly to deter predation and warn relatives of impending danger, which are believed to be the bioactive compounds responsible for intoxication [3]. Local people believe intoxication is due to

the consumption of dead stink bugs [3]. People who consume these insects may possess inherent addiction for which they continue consuming still knowing that it causes intoxication.

CONCLUSION

Ethnics of Arunachal Pradesh consume stink bugs as a local delicacy and many have inherent addiction which they continue consuming even after experiencing its intoxication. The toxicity is probably due to some neurotoxin as inferred from the symptomatology and clinical presentation. Probable food poisoning due to unhygienic collection and consumption cannot be ruled out too. However further research/studies are required to ascertain the cause of toxicity and to establish the safety of consuming the species of stink bug available in this region. Till then, the species of stink bug in this region doesn't seem safe and hygienic for human consumption.

DECLARATION

Conflict of Interest

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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