Amitraz toxicity after topical application: A rare case report with a brief review of the literature

Sir,

Amitraz is an acaricide of the formamidine pesticide group used to control animal ectoparasites. The US Environmental Protection Agency classifies amitraz as slightly toxic by the oral and inhalation routes (Toxicity Category III) and moderately toxic by the dermal route (Toxicity Category II).[1] Its use in humans is not recommended but cases of toxicity due to its accidental ingestion have been widely reported. Besides, toxicity in humans by the dermal route is rather uncommon. Herein, we report a case of amitraz toxicity due to the dermal exposure in an adult. A 24-year-old male weighing 60 kg presented to the emergency department after 6 h of topical application of amitraz with chief complaints of vomiting, sweating and drowsiness. As per the history given by the patient's family, the patient was suffering

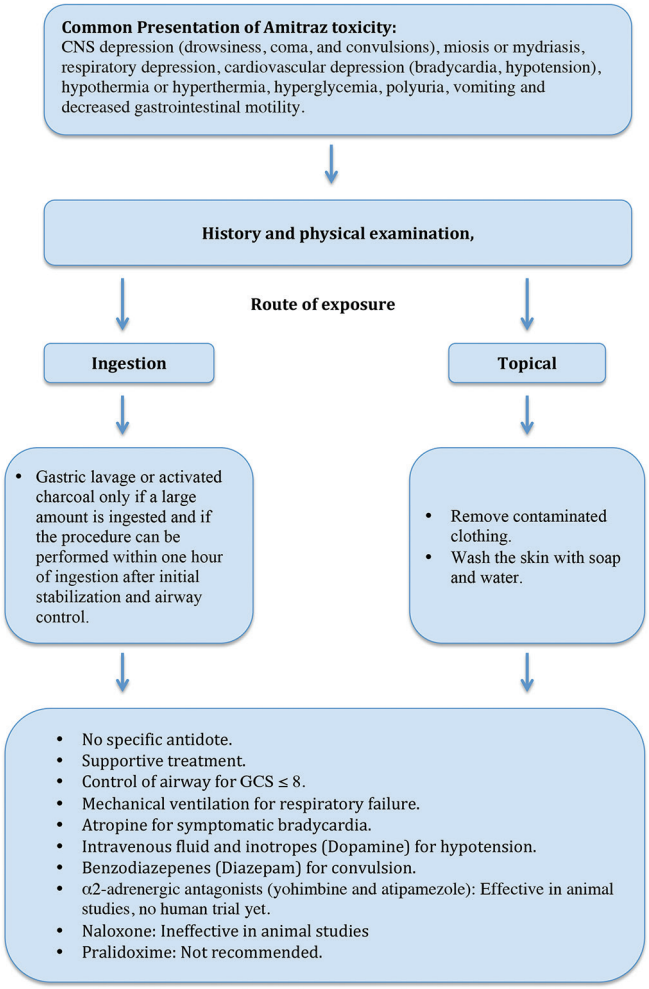

Figure 1: Management of Amitraz toxicity

from pediculosis for 3 months. To treat it, he applied 30–40 mL of 12.5% amitraz solution, which was kept in his house for use on animals, all over the trunk including head and extremities. On examination, the patient was drowsy with a Glasgow coma scale of 11/15 (E3V3M5) and airway reflexes were preserved. Pupils were bilaterally small-sized and sluggishly reacting to light. Vitals were stable and the patient was maintaining oxygen saturation (SpO2) 98% on 5 L/min of oxygen on a facemask. A consistent finding was the presence of sinus bradycardia with a heart rate of 48–58 beats/min. Routine investigations were within normal limits. We followed a conservative approach for the management of this patient with close monitoring. Clothes of the patient were changed and the affected area of the body was washed with soap and water. Supportive therapy in the form of antacids, multivitamins, diuretics and maintenance fluids was instituted. The patient was haemodynamically stable throughout the course with adequate urine output. The patient became fully conscious after 24 h and was discharged after 3 days of hospital stay.

Although dermal exposure is relatively uncommon, the purpose of this discussion is to enhance awareness regarding the potential for systemic poisoning through the skin and explore its clinical features. In a recent systemic review, only 8 cases out of 310 were reported from India.[2] In 92% of the cases, the route of exposure was ingestion. A review of 18 paediatric cases of dermal exposure leading to systemic toxicity demonstrated that an alteration in consciousness is the most common symptom and other features are also similar to toxicity by ingestion.[3] Kalyoncu *et al*. reported the onset of action from 5 min to 6 h for the oral route and 5 min to 24 h for dermal exposure.[4] The duration of action is short and its metabolites are mainly excreted by the kidneys. Amitraz poisoning carries a good prognosis with a low case fatality rate (2%), despite severe life-threatening clinical features depending on the dose.[2] In our case, the dose of amitraz applied was 4–5 g. However, the proposed lethal dose of the toxin is 200 mg/kg, which comes out to be around 12 g in average adults.[5]

The toxic effects of amitraz are due to its α2-adrenergic agonist actions in the central nervous system and both α1 and α2 adrenergic receptor stimulation in the peripheral region. Clinical features produced by amitraz toxicity may mimic organophosphate poisoning (OP) due to several shared features (miosis, bradycardia, hypotension) along with a history of possible insecticide poisoning. However, the presence of hyperglycaemia, hypothermia, reduced gastrointestinal motility, absence of hypersecretory state along with normal serum cholinesterase levels point against OP poisoning. A combination of two poisons like organophosphate-pyrethroid may be associated with prolonged cholinergic symptoms compared to either poison alone.[6] In cases where the source of poisoning is not evident, plasma cholinesterase level estimation can be done to differentiate between the two poisonings.

Since there is no specific antidote, the management of amitraz poisoning is considered to be supportive and symptomatic with closed monitoring [Figure 1]. Moreover, the role of atropine is controversial and should be avoided if not symptomatic. Dermal exposure of a non-lethal dose of amitraz in our case predominantly caused neurological and cardiovascular effects needing only supportive care.

Therefore, we believe awareness about symptomology and management of amitraz poisoning which is uncommon in the Indian subcontinent is necessary.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

Neeraj Kumar, Amarjeet Kumar, Abhyuday Kumar[1], Anil Kumar

Departments of Trauma and Emergency and [1]Anaesthesiology, AIIMS, Patna, Bihar, India

Address for correspondence:
Dr. Abhyuday Kumar,
A-3, Ashokpuri Colony, Khajpura, Patna, Bihar - 800 014, India.
E-mail: drabhyu@gmail.com

Submitted: 15-Jan-2020
Revised: 05-Apr-2020
Accepted: 29-Apr-2020
Published: 01-Jun-2020

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Access this article online	
Quick response code	Website: www.ijaweb.org
	DOI: 10.4103/ija.IJA_10_20

How to cite this article: Kumar N, Kumar A, Kumar A, Kumar A. Amitraz toxicity after topical application: A rare case report with a brief review of the literature. Indian J Anaesth 2020;64:532-4.