

Chlorantraniliprole Poisoning

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Abstract

Insecticide poisoning has become a common modality for deliberate self-harm in India. The past three to four decades have seen a remarkable change in the incidence and type of poisoning. A number of new compounds are being added every year, making management of poisonings a challenge. Early recognition of toxic substance and its prompt management is the key for saving a patient's life. Here, we present a case of alleged suicidal chlorantraniliprole poisoning with an overview of symptoms and its management.

Case report

A 33-year-old male presented to our emergency department with alleged history of ingestion of unknown amount of insecticide – chlorantraniliprole – at his own residence, which was followed by abnormal body movements associated with frothing from the mouth. Patient was a farmer by profession and he had no history of known psychiatric illness or addictions. Patient's family denied any such similar episodes of suicide attempts in the past by the patient. Patient presented in a gasping state with frothing from his mouth and altered mental status within 3 hours of ingestion of the substance. Gastric lavage was done in a local hospital with normal saline and then patient was referred to our hospital.

On examination, the patient was afebrile with pulse rate of 38 beats/min, blood pressure not recordable, respiratory rate 28/min, SpO₂ 27% on room air. He was unconscious, pupils were pinpoint bilaterally, tongue bite was present with no active seizures. Patient had frothing from mouth, on auscultation heart sounds were normal with no murmurs, chest had no crepitations, and bilateral plantar reflex was mute. Patient was intubated immediately and put on mechanical ventilator (PRVC mode with PEEP 5 mmHg) in view of respiratory distress and GCS of 3/15, and started on noradrenaline infusion in order to maintain blood pressure.

National Poison Information Centre of AIIMS, New Delhi was called to enquire about available antidote of this compound. Upon knowing that no specific antidote is available and no case was reported in past in our area, symptomatic treatment was started. Patient developed bradycardia and went into cardiac arrest within 2 hours of hospital admission. CPR was initiated following ACLS protocol and atropine 1 mg IV was given. Patient was then

started on atropine infusion 1 ml/hr. Patient was shifted to Intensive Care Unit for further care.

On admission, his haemoglobin was 14.1 g/dl and total leucocyte count was 26.3 cells/mm³ with differential leucocyte count showing 77% neutrophils and 12% lymphocytes. Renal function test showed urea of 38 mg/dl and creatinine 1.0 mg/dl with sodium and potassium 148 mEq/l and 3.00 mEq/l respectively. Prothrombin time was 19.7 sec, INR 1.53 sec. Urine routine and microscopy showed no albumin, few white blood cells and no RBCs. Patients ABG showed severe respiratory acidosis (pH 6.8, pCO₂ 92, lactate 6.59, bicarbonate 14.8). Chest X-ray showed no abnormality. Blood culture showed growth of *Klebsiella pneumoniae* on 3rd day. ECG showed QT prolongation, although 2D echo revealed no abnormality. Contrast enhanced MRI of brain showed mild diffuse cerebral oedema.

Routine investigations were repeated every day and antibiotics were upgraded depending on blood, urine, endo-tracheal tube and bronchoalveolar lavage culture and their sensitivity reports. His serum pseudo cholinesterase levels were low (1830 U/L) which was suggesting that this substance produces anti-cholinesterase-like effect. Subsequent serum pseudocholinesterase levels were repeated (3995 U/L) and dose of atropine was titrated accordingly.

Due to need for prolonged ventilation, patient was tracheostomised on 7th day post-admission. Later, the patient's parameters improved and he became better symptomatically and clinically. Patient was then shifted to the general ward and tracheostomy tube was removed on 20th day of admission. Patient was discharged subsequently after a counselling session by psychiatrist after a long stay of approximately 25 days. Patient is being followed-up in

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the OPD and currently is asymptomatic.

Discussion

Chlorantraniliprole¹ is a newer generation insecticide gradually gaining in popularity in pest control. Chlorantraniliprole is chemically 3-Bromo-N-[4-chloro-2-methyl-6-(methyl carbamoyl) phenyl]-1-(3-chloro-2-pyridine-2-yl)-1H-pyrazole-5-carboxamide. Chlorantraniliprole is a novel anthranilic diamide insecticide that functions via activation of the insect ryanodine receptors within the sarcoplasmic reticulum causing impaired regulation of muscle contraction. Sustained release of calcium levels within the cytosol leads to muscle contraction, paralysis and eventual death of the organism. While insects possess a single form of the ryanodine receptor distributed in muscle and neuronal tissue, mammals possess three forms which are widely distributed in muscle and non-muscle tissues. Insects showed rapid cessation of feeding, lethargy, muscle paralysis, and death after ingestion of this compound².

No data is yet available regarding its toxic effect in humans. However, we can only hypothesize from this case that chlorantraniliprole acts like an organophosphorus compound since this patient had pin point pupils, excessive secretions (frothing), bradycardia, low pseudocholinesterase levels and

improvement upon atropine infusion.

Studies showed no specific antidote is available, but timely intubation and ventilatory support for respiratory muscle paralysis, atropine infusions for bradycardia and treating of concomitant infections can go a long way in treating patients with chlorantraniliprole poisoning. Mishra *et al*² reported conduction defects by this compound in their case report. Bhattacharya *et al*³ reported a case of suicidal attempt with this compound presenting with fever and altered sensorium. However, previous studies on chlorantraniliprole poisoning have not reported such adverse effects of this substance and this prolonged stay. Hence, we are reporting this case to create awareness about the dangerous effects of this compound which can aid in saving the life of a patient presenting with its ingestion.

References

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