MED-PHOENIX: JOURNAL OF NATIONAL MEDICAL COLLEGE

CASE REPORT

LAMBDA- CYHALOTHRIN PYRETHROID POISONING PRESENTING AS ORGANOPHOSPHORUS POISONING

Niraj Kumar Keyal[1], Sudhakar Jha[2], Shishir Saurabh[3], Aananda Bhatta[3], Sabina Thapa[3]

[1]Department of General Practice and Emergency Medicine, Critical Care Unit, National Medical College, Birgunj, Nepal

[2]Department of Internal Medicine, National Medical College, Birgunj, Nepal

[3]Department of General Practice and Emergency Medicine, National Medical College, Birgunj, Nepal

Date of Submission *: April 15, 2026*

Date of Acceptance *: April 24, 2026*

Date of Publication : August 27, 2026

Correspondence to:

Niraj Kumar Keyal

Department of General Practice and Emergency Medicine, Critical Care Unit

National Medical College Teaching Hospital, Birgunj, Nepal

Email: nirajkumarkeyal@gmail.com

Contact No: +977 9855027141

Citation:

Keyal NK, Jha S, Saurabh S, Bhatta A, Thapa S. Lambda- Cyhalothrin Pyrethroid Poisoning Presenting as Organophosphorus Poisoning. Medphoenix. 2026;11(1):83-85.

DOI:https://doi.org/10.3126/medphoenix.v11i1.99319

Conflict of interest: None, ***Funding:*** None

Publisher: *National Medical College Pvt. Ltd.*

MedPhoenix - Journal of National Medical College (JNMC); 2026,11(1), available at www.jnmc.com.np

ISSN:2631-1992 (Online); ISSN:2392-425X (Print)

ABSTRACT

Introduction: *Lambda Cyhalothrin Pyrethroid is an uncommon lethal poison presenting with signs and symptoms that mimic organophosphorus poisoning. We present a case of a 16-year-old female presenting to the department of emergency medicine with an alleged history of ingestion of Kargol compound 20 ml containing Lambda Cyhalothrin Pyrethroid with a suicidal intention. At the time of presentation, her GCS was 3/15, bilateral pin point pupil, unrecordable blood pressure, pulse rate 40/minute, respiratory rate of 40/min, bilateral crepitations and oxygen saturation 52% on room air. She had multiple episodes of vomiting, nausea, diarrhea, and sweating. She was resuscitated immediately with 2 liters of normal saline, noradrenaline, and intubated with endotracheal tube of 7 mm ID. Atropine challenge test done was negative. Pralidoxime was started after atropinization. The patient had severe high-anion-gap metabolic acidosis and was managed with 8.4% sodium bicarbonate and fluids. After 6 hours of presentation, patient's party brought a box which showed that the compound was 10% pyrethroid, and atropine and pralidoxime were immediately stopped. She was managed with intravenous fluid, antibiotics, and Ivermectin, but despite all measures, she expired on the 2nd day of admission. Pyrethroid poisoning should be a differential diagnosis in organophosphorus poisoning.*

Keywords: *Lambda-Cyalothrin, Poisoning, Pyrethroid*

INTRODUCTION

Lambda- Cyhalothrin is an uncommon pyrethroid insecticide with fatal outcomes.[1] Pyrethroids are categorized into type 1 and 2 depending on addition of a cyano group to their basic structure. The mechanism is unclear and complex. They act on voltage-gated sodium, chloride, and gamma-aminobutyric acid channels, delaying their closure. Toxicity depends upon the addition of piperonyl butoxide, an organophosphorus compound, a stereoisomeric combination, and the vehicle used for the delivery of pyrethroid.[2, 3]

It usually presents with signs or symptoms like chorea, athetosis, tremors, paraesthesia, salivation, auditory hallucination, and cholinergic symptoms depending on the type of pyrethroids. [4,5] Atypical presentations like altered sensorium, respiratory distress which requires mechanical- ventilation support, acute kidney injury, hypotension, seizure, pancreatitis and pneumonia are more common in patients who had ingested ≥250 mL and serum lactate of ≥3.5 mmol.[6] Treatment is supportive with fatal outcome in atypical presentation with no specific antidote.[7,9]

CASE HISTORY

A 16 years, female, weighing 50kg, with no significant past history, presented to the emergency department of our center after being referred a local hospital without any intervention. She presented with chief complaints of ingestion of poison around 20ml poison six hours back and symptoms like nausea, multiple episodes of vomiting, loss of consciousness, and tremor following ingestion of Kargol containing Lambda-Cyhalothrin poisoning, with a suicidal intention.

At the time of presentation to the emergency medicine department, GCS was 3/15, blood pressure not recordable, pulse 140/min, respiratory rate 40/min, bilateral crepitations, and oxygen saturation 52% in room

air. S1S2 was audible with no murmurs. Abdominal was soft and nontender. Arterial blood gas (ABG) analysis revealed pH 6.83, PaO_2 of 54mmHg, $PaCO_2$ 28 mmHg, lactate of 12 mmol/L and a bicarbonate level of 12 mEq/L.

The patient was resuscitated with 2 liters normal saline and endotracheal intubation done with 7 mm endotracheal tube simultaneously. Gastric lavage done with 30 grams activated charcoal and 2L of saline as per our hospital protocol, noradrenaline 0.3 mcg/kg/min, vasopressin 0.4 U/kg, and sodium bicarbonate 5 ml/ hour. An Atropine challenge test was negative, evidenced by not increase in 20% heart rate from baseline. Atropinization attained with 74 mg and infusion was started at 15 mg/hour of atropine. Also Pralidoxime chloride was started at 1 gram six hourly.

Table 1: Laboratory profile of the patient

Total leucocyte count (TLC)	27900/mm^3
Platelets	184000/mm^3
Hemoglobin (Hb)	10.2 gm/dl
Urea	79 mg/dl
Creatinine	1.9 mg/dl
Sodium	144 mmol/L
Potassium	3.8 mmol/L
Total bilirubin	3.7 mg/dl
Direct bilirubin	0.3 mg/dl
Total protein	6.3 mg/dl
Albumin	3.7 mg/dl
Alanine aminotransferase (ALT)	850 U/L
Aspartate aminotransferase (AST)	1278 U/L
Alkaline phosphatase (ALP)	172 U/L
Prothrombin time (PT)	25 seconds
International normalized (INR) ratio	1.9

RBC cholinesterase and Serum acetylcholinesterase could not be done as these tests were not available at our hospital. Bilateral infiltrates was seen in chest X-ray (Fig. 1)

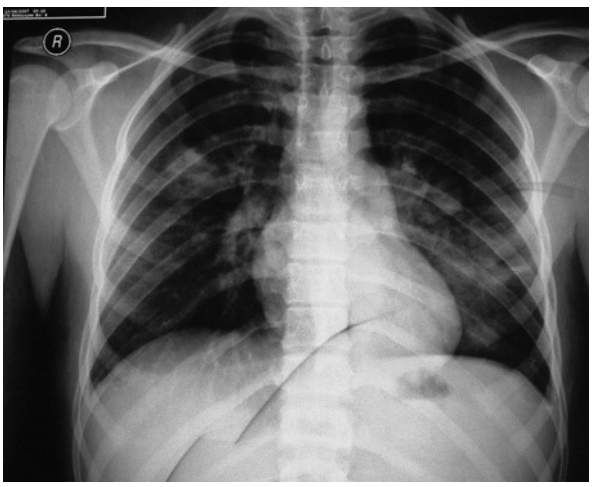

Figure1. Bilateral infiltrates seen in Chest x-ray.

The patient was managed on ventilatory support (mode VC/ tidal volume of 300 ml, respiratory rate of 16/min, FiO_2 100% and PEEP 10 cm of H_2O), Meropenem 1 gram and clindamycin 600 mg every eight hours, respectively. Levetiracetam 1 gram every eight hours for seizure prophylaxis. Routine monitoring of vital signs, input and output charting, and ulcer protection with IV ranitidine 50 mg eight hourly were done.

There was no urine output, and blood pressure was non-recordable. Adrenaline was started, and repeat ABG showed pH 6.73, a PaO_2 of 68mm Hg, a $PaCO_2$ of 46 mm Hg, a lactate level of 20 mmol/L, and a level of bicarbonate 18 mEq/L. The patient party brought a box after 6 hours of admission, which showed that the poison was Lambda- Cyhalothrin. Atropine and pralidoxime was immediately stopped, but blood pressure was still not recordable with a gradual increase in lactate and a fall in pH. Patient expired on the second day of admission. The immediate cause of death was refractory distributive shock and antecedent cause was pyrethroid poisoning with severe high anion gap metabolic acidosis.

DISCUSSION

Lambda- Cyhalothrin is a type 2 compound that is more stable and toxic. Organophosphorus compounds are added in different concentrations to increase the stability and toxicity of pyrethroid causing nicotinic and cholinergic features and hence in most of the cases, use of the atropine is seen as empiric first line of treatment, which was present in our patient.[10]

Table 2: Comparison of OP and pyrethroid by clinical features

Clinical Features	Organophosphate poisoning (OP)	Pyrethroid poisoning	Diagnostic challenges
Key toxidromes	Cholinergic crisis (Lacrimation, Salivation Urination, Gastric upset, Defecation, Emesis, Miosis)	Neuro-excitement (tremors, paresthesia, choreoathetosis)	Classic cholinergic signs point towards OPs, but some symptoms overlap
Pupils	Typically, miosis due to parasympathetic activation	Usually normal or sometimes mydriasis, but not consistently miotic	Pupillary response can be a key differentiator if observed
Heart Rate	Usually, bradycardia	Can be normal, tachy- or bradycardia; not consistently slow	Bradycardia strongly suggests OP poisoning

Muscle Effects	Muscle fasciculations, weakness (leading to respiratory distress), potential delayed neuropathy.	Muscle twitching, fasciculations, fine or coarse tremors, hyper-excitability.	Muscle fasciculations can occur in both, leading to misdiagnosis
Secretions	Excessive salivation, lacrimation, bronchorrhea (pulmonary edema).	Salivation and pulmonary edema can occur, but generally less severe than OPs.	Excessive secretions are a hallmark of OPs, but present in both.
Central Nervous System	Seizures, coma, restlessness, confusion.	Dizziness, headache, memory impairment, convulsions (typically with high doses).	Seizures and altered mental status can occur in both, complicating diagnosis

It usually presents with nausea, vomiting, tremor and hyper excitability, and atypical symptoms. Atypical symptoms are present in 40% patients who had lactate levels more than 3.5 mmol, which was present in our patient, and the consumption amount should be more than 250 ml, but our patient had consumed only 20 ml of 10% pyrethreoid poison. This difference may be due to patient parties not knowing the exact amount, and different patient populations.

Seizures, pulmonary edema, and hemorrhage are major manifestations which are life-threatening for pyrethroid poisoning[9] as there is no known specific antidote and management is only supportive. Atropine is contraindicated because it causes seizures[1], but in most patients, it is used because of cholinergic presentation that causes an increase in mortality, and poor outcome, which was present in our patient.

Gastric lavage should be avoided in this poisoning, and activated charcoal should be used within 1 hour of presentation but gastric lavage was done in our patient due to delayed identification of the poison and hospital protocol. Seizure can be controlled with benzodiazepines or Phenobarbitone, whereas in our patient, Levetiracetam was used. Paresthesia can be treated by Vitamin E. Ivermectin is used to control salivation and fasciculations with limited central activity and was used in our patient.

ACKNOWLEDGEMENT: None

REFERENCES

1. Ramchandra AM, Chacko B, Victor PJ. Pyrethroid Poisoning. Indian J Crit Care Med. 2019 ;23(Suppl 4): S267-S271. [Pub Med | DOI]

2. Scheepers LD, Freercks R, Merwe EV. Acute cypermethrin and other pyrethroid poisoning - An organophosphate-like poisoning: A case report and review. Toxicol Rep. 2023; 11:107-10. [Pub Med | DOI]

3. Cham E, Tse J, Chong YK, Chen ML, Wong OF. A case of Pyrethroid poisoning with clinical presentation mimicking organophosphate poisoning. HongKong Journal of Emergency Medicine 2016; 23:47-51. [DOI]

4. Weinjie W, Houqing L, Xuchun L, Gengyun S. Acute pancreatitis during lambda Cyhalothrin poisoning. Toxin Reviews 2014;33(3):136-7. [DOI]

5. Sakr S, Rashad WA. Lambda-cyhalothrin-induced pancreatic toxicity in adult albino rats. Sci Rep. 2023 Jul 18;13(1):11562 [Pub Med | DOI]

6. Cha YS, Kim H, Cho NH, Jung WJ, Kim YW, Kim TH et al. Pyrethroid poisoning: features and predictors of atypical presentations. Emerg Med J. 2014; 31(11):899-903. [Pub Med | DOI]

7. Iyadurai R, Peter JV, Lenin A, Yadav B, Reginald A, Abhilash KPP et al Pyrethroid poisoning: Insecticide with mild human toxicity. Med J Armed Forces India. 2024; 80(Suppl 1): S217-S222. [Pub Med | DOI]

8. Ali R, Patel A, Owolabi M, Bengart R, Klein E, Sugnanam V. A Rare Case of Pyrethroid Poisoning Presenting as Auditory Hallucination. J Med Cases. 2022; 13(2):76-9. [Pub Med | DOI]

9. Sudan S, Kaur N, Taneja R, Kaur N, Mehmi P. Management of Lambda-Cyhalothrin Poisoning in a North Indian Healthcare Setup: A Rare Case. Cureus. 2022; 14(12): e32746. [Pub Med | DOI]

10. Silwal P, Adhikari R, Yadav B, Sah SK, Bhatt A, Basnet S. Lambda-cyhalothrin ingestion: an infrequent yet concerning presentation of pyrethroid poisoning. Ann Med Surg (Lond). 2023; 85(10):5250-4. [Pub Med | DOI]