

# **Subcutaneous injection of organophosphate: a case report of unusual poisoning**

Shafeajafar Zoofaghari, Afshar Fazeli Dehkordi, Kourosh Nemati, Mozhdeh Hashemzadeh\*, Arman Otroshi

Shafeajafar Zoofaghari: Isfahan Clinical Toxicology Research Center, Department of Clinical Toxicology, Isfahan University of Medical Sciences, Isfahan, Iran

Afshar Fazeli Dehkordi: Isfahan Clinical Toxicology Research Center, Department of Clinical Toxicology, Isfahan University of Medical Sciences, Isfahan, Iran

Kourosh Nemati: Isfahan Clinical Toxicology Research Center, Department of Clinical Toxicology, Isfahan University of Medical Sciences, Isfahan, Iran

Mozhdeh Hashemzadeh: Clinical Informationist Research Group, Health Information Research Center, Isfahan University of medical sciences, Isfahan, Iran  
(Corresponding author) Email: [mojdeh.hashemzadeh@gmail.com](mailto:mojdeh.hashemzadeh@gmail.com)

Arman Otroshi: Isfahan Clinical Toxicology Research Center, Department of Clinical Toxicology, Isfahan University of Medical Sciences, Isfahan, Iran

## **Abstract**

Organophosphate poisoning by self-injection is rare. Current case report describes a man with subcutaneous self-injected OP. poisoning presenting with delayed. He was treated with pralidoxime. Through the observation, dose and the time between poisoning until time to start treatment we can conclude different presentations and outcomes of OP poisoning.

**Keywords:** Organophosphate Poisoning, Subcutaneous Injections, Case Report

## **Key clinical message**

OP compound toxicity by parenteral route is a diagnostic challenge. Under observation of these patients, concluded different presentations and outcomes of OP poisoning depend not only on the pesticide, the dose and the time between poisoning and start of treatment, but also on the route of poisoning.

## **Introduction**

Organophosphate (OP) refers to a various group of chemicals that are found in some of products worldwide. OPs are used in agricultural productivity and the control of deadly vector-borne illnesses (1). OPs poisoning is common in developing countries (2). Poisoning occurs mostly by voluntary ingestion, inhalation, or by absorption through the skin (3). Toxicity can also occur rarely by self-injection through intramuscular or intravenous route (4). Some cases showed local and other systemic toxicity symptom (5). We describe a case of self-injected 1 cc Organophosphate (Diazinon) poisoning around the umbilicus, presenting with drowsiness, nausea and vomiting, which was successfully treated on clinical judgment. Interesting points about this case are that the onset of the patient's clinical symptoms were beginning with a delay of about 8 hours and the kind of poison (Diazinon). Literature review in PubMed database reported 172 cases in which the OP used for suicide purpose.

## **Case History**

A male 61 y/o brought to the hospital by EMS. He shown drowsiness, weakness, vomiting & diarrhea 8 hour after self-injection 1 cc of OP (Diazinon) around the umbilicus subcutaneously (He didn't have history of specific disease). He transferred to ICU due to cholinergic symptoms such as Sweating, diarrhea and vomiting. . He had a past history of having attempted suicide one times with eating OP. Vital signs revealed pulse rate of 91/minute, blood pressure of 140/80 mmHg, respiratory rate of 18 per minute, temperature 36.9 and pulse oximeter showing 96% saturation on room air. (Results of laboratory tests in admission show in figure 1). Neurological examination revealed normal cranial nerves. Miosis was detected bilaterally, reacting to light with absent Doll's eye movement. Deep tendon reflexes were 2+. Examination of chest was normal. No crackles were heard on chest auscultation. Examination of other systems was normal. Blood gas analysis showed normal values. Chest X-ray was clear.... EKG, cardiac enzymes, and CBC were normal. Plasma cholinesterase test was 3867(normal range: 4000-12000 IU/L). Late the first day, he developed abdominal pain and Cramps. He was treated with hyoscine and pralidoxime. hyoscine was given 10 mg PO q6h and , pralidoxime infused at the rate of 300 mg/h after 1.5 gr bolus IV. Response to pralidoxime treatment was good and pralidoxime infusion was continued for total 2 days. His pain was controlled with hyocsine. He was finally discharged from the hospital on day 4.

## **Discussion**

OP's products have been used as insecticides worldwide for many years (6). Global research has shown that on average 3,000,000 people are exposed to OP each year, with up to 300,000 fatalities. Toxicity generally results from accidental or deliberate ingestion of, or exposure to, agricultural pesticides (7). Suicidal poisoning by ingestion of OP insecticides is common in developing countries (8-10).

OP absorbed by virtually any route, including transdermal, transconjunctival, inhalation, across the GI or genitourinary mucosa, and through direct injection (11). Onset of systemic symptoms may occur in 5 minutes with inhalation, and most patients develop symptoms within 12 hours of ingestion, unless exposure to fat-soluble organophosphates has occurred or

if significant metabolic activation must occur (12). Pulmonary toxicity from bronchorrhea, bronchospasm, and respiratory depression is the primary concern (13).

Medical management of patients who poisoned with OP is complex and protracted. All symptomatic patients should receive therapy with oxygen, atropine, an oxime (eg, pralidoxime), and a benzodiazepines (eg, diazepam) (7).

Initial treatment must focus on adequate use of atropine. Optimizing oxygenation prior to the use of atropine also is recommended to minimize the potential for dysrhythmias (14). Recommended initial doses of atropine are 1 mg in adults, 0.01–0.04 mg/kg in children intravenously and repeated every 5 minutes with increasing doses, if needed. Doses of atropine should be decreased gradually and treatment should not be interrupted until complete healing is achieved (15).

Patients with significant respiratory muscle weakness are usually treated with an oxime. Treatment with oximes may be most effective when started early. Oximes are usually continued as long as atropine is continued. There is no endpoint for prescribing enough dose of oximes. To give appropriate dose of pralidoxime to a patient, it would be better to determine the dose according to the severity of OP poisoning (16).

Diazepam is used for treatment of seizures caused by exposure from OP pesticide after 30 min post-exposure to either the OP chemical or seizure onset (17).

Some Op's effects are organophosphate-induced delayed neurotoxicity and delayed polyneuropathy (1 to 3 weeks after exposure), intermediate syndrome (24 to 96 hours after resolution of an acute, severe cholinergic crisis) (18). Effect's manifestations vary in accordance with plane of administration. With self-injection, symptoms will appear after some delay and if the quantity administered is less, there may be only local abscess (2).

In the present case, the onset of clinical symptoms began 8 hour later after injection. However, literature review in the PubMed database reported a time between 30 minutes to 2.5 hours.

Sahajal Dhooria and colleagues report a case of 19 y/o man with an alleged history and suicide ingestion of OP that onset his clinical symptoms had been 30 min after injection (19).

A case of 46 y/o female who ingested 120 mL of chlorpyrifos was reported by Christine Licata and colleagues. Her clinical symptoms had begun 2/5 hour after injection (20).

**Declaration of patient consent:** The authors certify that they have obtained appropriate patient consent forms.

**Financial support and sponsorship**

Nil.

**Acknowledgment:**

Research Team Appreciates clinical informationsist research center dependent on Deputy of research and technology of Isfahan University of Medical Sciences

## **Authorship**

Author 1: Shafeajafar Zoofaghari: Responsible for monitoring the accuracy of medical content, literature search, data acquisition and help in manuscript preparation

Author 2: Afshar Fazeli Dehkordi: Responsible for literature search, data acquisition and help in manuscript preparation

Author 3: Kourosh Nemati: Responsible for literature search, data acquisition and help in manuscript preparation

Author 4: Mozhdeh Hashemzadeh: Responsible for manuscript preparation, editing, review and its guarantee

Author 5: Arman Otroshi: Responsible for literature search, data acquisition and help in manuscript preparation

## References

1. Naughton SX, Terry AV, Jr. Neurotoxicity in acute and repeated organophosphate exposure. *Toxicology*. 2018;408:101-12.
2. Pandit V, Seshadri S, Rao SN, Samarasinghe C, Kumar A, Valsalan R. A case of organophosphate poisoning presenting with seizure and unavailable history of parenteral suicide attempt. *Journal of emergencies, trauma, and shock*. 2011;4(1):132-4.
3. Badhe A, S S. An intravenous organophosphate poisoning with intermediate syndrome: An unusual way of intoxication. *Indian J Crit Care Med*. 2006(10):191-2.
4. Lyon J, Talyor H, B A. A case report of intravenous malathion injection with determination of serum half-life. *J Toxicol Clin Toxicol*. 1987(25):243-9.
5. Ghosh S. Atypical manifestations of organophosphorus poisoning following subcutaneous injection of Dichlorvos with suicidal intention. *Indian J Crit Care Med*. 2014;18(4):244-6.
6. Güven M, Unlühizarci K, Göktaş Z, S K. Intravenous organophosphate injection: an unusual way of intoxication. *Hum Exp Toxicol* 1997;16(5):279-80.
7. Organophosphate and carbamate poisoning [Internet]. 2020 [cited 1/25/2021]. Available from: [https://www.lib.utdo.ir/contents/organophosphate-and-carbamate-poisoning?search=organophosphate%20poisoning&source=search\\_result&selectedTitle=1~28&usage\\_type=default&display\\_rank=1](https://www.lib.utdo.ir/contents/organophosphate-and-carbamate-poisoning?search=organophosphate%20poisoning&source=search_result&selectedTitle=1~28&usage_type=default&display_rank=1).
8. Liu H, Kan B, Jian X, Zhang W, Zhou Q, J W. Parasuicidal poisoning by intramuscular injection of insecticide: A case report. *Exp Ther Med*. 2013;6(3):696-8.
9. Soummer A, Megarbane B, Boroli F, Arbelot C, Saleh M, Moesch C, et al. Severe and prolonged neurologic toxicity following subcutaneous chlorpyrifos self-administration: a case report. *Clin Toxicol (Phila)*. 2011;49(2):124-7.
10. Yucel I, Demiraran Y, M A. Suicide attempt with injection of insecticide in both wrists. *Orthopedics*. 2008;31(2):174.
11. Badrane N, Askour M, Berechid K, Abidi K, Dendane T, AA Z. Severe oral and intravenous insecticide mixture poisoning with diabetic ketoacidosis: a case report. *BMC Res Notes*. 2014;7:485.
12. Bala I, Pratap M, Nakra D, T R. Prolonged cholinergic crisis and compartment syndrome following subcutaneous injection of an organophosphate compound for suicide attempt. *J Forensic Leg Med*. 2008;15(4):256-8.
13. Büyükcım F, Cebeci Z, Zengin Y, U K. Intravenous organophosphate (dichlorvos) injection and the prolonged effect of toxin. *Eur J Emerg Med*. 2011;18(2):128-9.
14. Organophosphate Toxicity Medication [Internet]. 2020 [cited 1/25/2021]. Available from: <https://emedicine.medscape.com/article/167726-medication>.
15. Karakus A, Celik MM, Karcioğlu M, Tuzcu K, Erden ES, Zeren C. Cases of organophosphate poisoning treated with high-dose of atropine in an intensive care unit and the novel treatment approaches. *Toxicology and industrial health*. 2014;30(5):421-5.
16. Due P. Effectiveness of High Dose Pralidoxime for Treatment of Organophosphate Poisoning. *Asia Pac J Med Toxicol*. 2014;3:97-103.
17. Kuruba R, Wu X, Reddy DS. Benzodiazepine-refractory status epilepticus, neuroinflammation, and interneuron neurodegeneration after acute organophosphate intoxication. *Biochimica et biophysica acta Molecular basis of disease*. 2018;1864(9 Pt B):2845-58.
18. Parrillo JE. *Critical Care Medicine Principles of Diagnosis and Management in the Adult*. 5 ed: Elsevier; 2019.
19. Dhooria S, Behera D, Agarwal R. Amitraz: a mimicker of organophosphate poisoning. *BMJ case reports*. 2015;2015.
20. Licata C, Liu L, Mole D, Thorp J, Chand R, Chaulagain S. Social and Cultural Factors Leading to Suicide Attempt via Organophosphate Poisoning in Nepal. *Case reports in psychiatry*. 2019;2019:7681309.