

Case Report

Parenteral Dichlorvos Poisoning, an Unusual Way of Intoxication

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ABSTRACT

Organophosphate (OP) poisoning is very common form of poisoning in Indian population because of its availability and easy access. Intoxication occurs following the absorption of OP agents through gastrointestinal tract, skin and respiratory tract and rarely by intramuscular or intravenous route. The clinical features depend on the amount of the poison consumed, its concentration, the route of administration and the time of instituting therapy. Suicidal poisoning by ingestion of organophosphate (OP) insecticides represents a serious emergency with a high mortality rate. However, attempted suicide via the parenteral route has rarely been reported.

The present study reports a case of self-injection of an organophosphorus insecticide dichlorvos into proximal region of the left arm. The patient developed black discoloration at the injection site & cellulitis swelling of the affected limb following injection. Conservative management resulted in improvement of symptoms of the patient within a 8-10 days, but subsequent follow up after 7 days showed abscess at site of injection which required.

Keywords: Op-organophosphate, parenteral (administered elsewhere in body then the mouth)

CASE REPORT

The following case illustrate the pathologies developed on the skin, beneath the skin and on the muscles resulting from the injection of liquid containing Dichlorvos four hours before coming to our department, a 22-year-old man attempted suicide by injecting his left arm proximal region with insecticide (by taking the Liquid toxin into the syringe) that contains NUVAN (dichlorvos 82%). He was conscious with a blood pressure of 110/70 mm Hg, pulse of 120 beats/min. Chest was clear, normal size pupils, and reaction to light was normal. on local examination radial and ulnar pulses were palpable, increased temperature and edema in proximal left arm, with brownish discoloration on his arm with black dis-

colouration at injection site was formed . Laboratory tests revealed a WBC of 13,000/mm³ and LDH and CK markedly increased.

He was treated with I/V Injection Atropine which was titrated to optimum doses, inj. pralidoxime, antibiotics, local application of magnesium sulphate with glycerine ointment, oral analgesic and left arm elevation. On the first day color and edema in left arm got worse. Surgical opinion was sought and advised for conservative management.

After 24 hr of self-injection of an organophosphorus insecticide dichlorvos into proximal region of the left arm, black discoloration at the injection site & swelling of the affected limb. (Fig. 1)



Fig. 1: Discoloration at injection site & swelling of affected limb.

His treatment continued using empirical antibiotics (Piperacillin+tazobactam 4.5 gm three times a day, clindamycin 600 mg/ three times daily) & limb elevation. While he was in the hospital, the systemic symptoms of Organophosphorus intoxication were not observed. At the end of the eighth day, when the edema and skin changes diminished he was discharged from the hospital. At consultation, 7 days later, it was observed that at the site of injection abscess was formed which subsequently required incision and drainage.

DISCUSSION

Dichlorvos, an organophosphate (OP) (according to World Health Organization [WHO] pesticide classification No: 1b47, no: 62-73-7, UN no: 3018, physical state: L, LD50: 56 mg/kg), is a direct-acting cholinesterase (ChE) inhibitor. Dichlorvos does not occur naturally in the environment, but is manufactured by industry. It is used to protect stored products and crops (mainly in greenhouses), and to control internal and external parasites in livestock (granules of impregnated resin) and insects in houses, buildings, aircraft, and outdoor areas (as aerosols, liquid sprays, resin strips). Dichlorvos is sold under many trade names including Vapona, Atgard, Nuvan, and Task. Dichlorvos may also be called DDVP, an abbreviation for its full chemical name. Pure dichlorvos is a dense, colorless liquid that evaporates easily into the air and dissolves slightly in water.

Dichlorvos has a sweet smell and readily reacts with water. Dichlorvos present at hazardous waste sites will most likely be in a liquid solution or solid plastic pellets or strips. Dichlorvos is taken into human body very rapidly by the lungs, stomach, or skin. [1,2]

Dichlorvos is not generally used for direct application on soil or to water. Any residue in soil resulting from the treatment of crops will be small and short-lived, due to volatilization and degradation. Therefore, contamination of ground water or surface water is unlikely to occur in normal practice. In air, dichlorvos is rapidly degraded, the rate depending on the humidity of the air. Dichlorvos can chemically react with an important enzyme in brain and nerves called acetylcholinesterase and stop them from working properly. [1,2]

Accidentally drinking as little as 1 ounce or 30 mL of a pesticide containing 5% dichlorvos could also cause harmful effects. It was reported that 2 pesticide workers died after spilling concentrated dichlorvos on their skin and failing to wash it off promptly. It is not known exactly how much dichlorvos they absorbed through their skin. Experiments in animals show that dichlorvos can be just as harmful when it is applied to the skin as when inhaled or swallowed. Monkeys that had dichlorvos put on their skin (50 mg/d) died after 10 doses. [2]

Sundarka and colleagues [3] has reported an 18-year-old woman patient who injected herself OP insecticide. She came to the hospital, 3 hours after the injection (Isopropoxyphenyl N-methylcarbamate) to the rear side of her left hand, suffering from the pain. No pathologies were found during her physical consultation; but during the local consultation of the injection region, thrombosis cellulitis symptoms were found in the distal region of her arm; pain during movement of the hand and increase local inflammation after the bullae formation had been observed 48 hours after injection. Fasciotomy was performed to relieve the symptoms. The pus was sterile, possibly due

to extravasation, chemical inflammation, and necrosis, or vasospasm after IV injection resulting in ischemia, stasis, and secondary infection. [3]

In the second case, [4] a 24-year-old woman came to the hospital suffering from injection to frontal arm region. She was conscious with pinpoint pupils but vital symptoms were found to be normal. At first, she denied having taken anything toxic. But later, she confessed she had taken the OP insecticide in IV form. In our case, the male patient injected OP insecticide to his left arm to commit suicide; and 4 hours later, he came to the ED suffering from cellulitis on his arm. This shows that, IV injection of OP and IM injection of OP have similar clinical scenarios.

Neurotoxic effects of OP may be disastrous. [5] Although the patients who come to the ED do not always tell the true history of IV or IM injection. In this cases thought should come to mind if they have thrombophlebitis and cellulitis symptoms in the extremities. In our case, a systemic symptom or difficulty in respiration had not been observed resulting from parenteral injection of OP. This was probably due to the amount of the OP injected and because the OP transition to the circulatory system was less.

CONCLUSION

Organophosphate (OP) poisoning occurs mainly via the gastrointestinal and respiratory tracts and the skin. Exposure to the chemical via other routes causes varying symptoms. The type and severity of symptoms depend on the amount of OP involved and the nature of the exposure. The initial treatment of poisoning focuses on ensuring adequate oxygenation, followed by the administration of atropine to antagonize the muscarinic and central

nervous system effects of the OP. [6] Pralidoxime is usually used in the case of respiratory depression, muscle fasciculation or muscular weakness to antagonize the toxicity of OPs on nicotinic synapses. [7] The dose of atropine and pralidoxime should be controlled flexibly.

In the present case, signs or symptoms of systemic toxicity resulting from the parenteral injection of OP did not manifest immediately. This may have been due to the amount of OP injected and the low level of OP transition to the circulatory system. In the region of the parenteral injection, necrosis and cellulitis had been observed resulting from the chemical inflammation of the OP compounds, with danger of development of compartment syndrome. Although initial improvement with conservative treatment was observed but on follow up abscess was formed at injection site which required Fasciotomy and surgical debridement.

REFERENCES

1. IPCS: Environmental Health Criteria 79; Dichlorvos, Geneva p 157, World Health Organization, 1989
2. Agency for Toxic Substances and Disease Registry (ATSDR): Toxicological Profile for Dichlorvos, Atlanta, GA, U.S. Department of Health and Human Services, Public Health Service, 1997
3. Sundarka MK, Gupta HL, Parakh N, et al: Self injection of insecticide. J Assoc Physicians India 2000;48:856
4. Pattnaik RB, Satpathy SK, Mishra SK, et al: Self injection of organophosphorous insecticide. J Assoc Physicians India 2000;49: 770.5.
5. Sennanayake K, Karalleiedde L: Neurotoxic effect of organo- phosphorous insecticides-an intermediate syndrome. N Engl J Med 1987; 316:76
6. Worek F, Koller M, Thiermann H and Szinicz L: Diagnostic aspects of organophosphate poisoning. Toxicology 214:182-189, 2005..
7. Paudyal BP: Organophosphorus poisoning. JNMA J Nepal Med Assoc 47: 251-258, 2008.

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