

# Rare findings of dichlorvos intoxication: Erythematous and bullous skin lesions

 Kubilay Issever,  Tezcan Kaya,  Merve Hilal Tepe,  Didar Senocak

Department of Internal Medicine, Faculty of Medicine, Sakarya University, Sakarya, Turkey

Copyright@Author(s) - Available online at [www.annalsmedres.org](http://www.annalsmedres.org)

Content of this journal is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License.



## Abstract

Dichlorvos (2,2 –dichlorovinyl dimethyl phosphate) is a synthetic organophosphate used as an insecticide. Usually, systemic signs and findings are seen in patients with orally intoxicated by organophosphate. Cutaneous findings are rarely seen in oral dichlorvos intoxication. We reported a 44 years old female patient who was rushed to the emergency department just after she took 3 or 4 sips of liquid-based insecticide containing dichlorvos. On the second day of the follow up in the internal medicine department, a few bullous and erythematous lesions (max. diameter between 2 and 3 cm) showed up on her left periumbilical and bilateral inframammary region. The lesions healed after application of topical treatments. We should keep in mind that skin lesions can be seen in the course of poisoning with organophosphates like dichlorvos.

**Keywords:** Dichlorvos; organophosphate poisoning; skin manifestations

## INTRODUCTION

Drug intoxication is one of the most frequently seen diagnoses in emergency department cases. Although some patients might be asymptomatic, the clinical course might vary from nausea-vomiting to coma depending on the substance and the dose patients take (1). Exposures causing drug intoxications can occur through gastrointestinal tract, airway, parenteral route, rectal route or skin. Cutaneous toxicity can also be classified according to the route of exposure, i.e., either due to systemic effects or local irritation of the skin (2).

Dichlorvos is a synthetic organophosphate which is widely used as insecticide (3). Exposure to this substance via ingestion or inhalation causes inhibition of acetylcholinesterase enzyme in the body. As a result of dichlorvos intoxication, neurotoxic symptoms such as perspiration, vomiting, diarrhea, drowsiness, fatigue, and headache can be seen (3). Exposure to high concentrations can result in convulsions and coma (3). There is not much data about cutaneous lesions caused by oral administration of this substance.

We aimed to report a patient presented with erythematous and bullous skin lesions after ingestion of a solution containing dichlorvos with suicidal ideation in this case.

## CASE REPORT

A 44 years old female patient was rushed to the emergency department just after she took 3 or 4 sips of liquid-based insecticide containing dichlorvos (2,2 –dichlorovinyl dimethyl phosphate). She had no significant illness in her personal or family history and no history of using any drug. On physical examination, her general status was fine, she was conscious, cooperated and oriented, her vital signs were stable. No pathological finding was observed on her systemic examinations including dermatologic examination. Her biochemical, complete blood count and blood gas test values were within normal ranges. She was admitted to the internal medicine clinic for observation. She was not treated with antidotes since there was no sign of systemic organophosphate poisoning. Normal saline (100 cc/hour) was given to the patient for hydration. On the second day of admission, a few hyperemic and bullous lesions maximum diameter of 2 or 3 cm appeared on her left periumbilical and bilateral inframammary regions (Figure 1 and 2). When we interrogated the patient, she said that the liquid did not pour out on her skin while drinking it. She also said that the liquid did not contaminate her hands neither she touched her body with contaminated hands. On requested dermatology consultation, erythematous and bullous lesions were considered as secondary to drug intake. Drying the bullae by withdrawing the containing

**Received:** 17.03.2020 **Accepted:** 01.06.2020 **Available online:** 22.03.2021

**Corresponding Author:** Tezcan Kaya, Department of Internal Medicine, Faculty of Medicine, Sakarya University, Sakarya, Turkey

**E-mail:** [tezcankaya@gmail.com](mailto:tezcankaya@gmail.com)

fluid with an injector, wet dressing with normal saline, and topical cream treatment containing *Triticum Vulgare* aqueous extract-ethylene glycol monophenyl ether and fusidic acid were recommended by dermatology consultant. The recommended treatment was applied and regression of the lesions was observed on the second day of treatment. On the fourth day of follow up, the patient was discharged from the hospital with the recommendation of dermatology polyclinic follow up since her general status and lab results were fine and her skin lesions tended to heal with treatment.



**Figure 1.** Hyperemic and bullous lesions located on the bilateral inframammary regions of the patient



**Figure 2.** Bullous hyperemic lesions located on the left periumbilical region of the patient

## DISCUSSION

Intoxication cases are frequently seen in the daily practice of emergency and internal medicine departments. Exposure in these cases can occur through gastrointestinal tract, airway, parenteral route, rectal route or skin whether with the aim of suicide or by accident. Way of administration, concentration and physicochemical properties of the substance affect the absorption (4). Toxic substances are inactivated by biotransformation or transformed into toxic metabolites with the effects of enzymes in the body (4). Following biotransformation, these substances are removed from the body through kidneys, bile, respiration, perspiration, salivary, lacrimal, and mammary glands (4).

In developing countries like our country, organophosphate intoxication is one of the most frequently seen emergency cases (4). Since organophosphate compounds are easy to reach and provide, the frequency of exposures for suicidal purposes or accidents increase (4). Following

administration, organophosphates usually affect through inhibition of cholinesterase activity. Organophosphates cause accumulation of acetylcholine in the periphery through irreversible inhibition of acetylcholinesterase enzyme (5).

The solution containing dichlorvos as the active ingredient which was administered by the patient, in this case, is an organophosphate used as an insecticide (3). We can see a wide range of symptoms in the course of organophosphate intoxications. It causes peripheral cholinergic effects by acting upon nicotinic and muscarinic receptors. In cases organophosphates cause intoxication through the oral route, the time between exposure and onset of symptoms can vary from minutes to days. Inhalation is the quickest route for the onset of symptoms (5). In this case, the patient was exposed to organophosphate through the oral route and despite having no systemic symptom, bullous lesions showed up on her skin 24 hours following exposure. We interrogated the patient carefully to rule out the possibility of skin contact by spilling or touching with contaminated hands. As a result of the answers of the patient, we came to an agreement that the probability of skin contact is very low in this case.

Symptoms coming into prominence in organophosphate intoxications are cholinergic-systemic symptoms due to cholinesterase enzyme blockage (4). In a serial of 34 cases Meral et al. studied on, the routes of administration for insecticides were reported as 73% gastrointestinal system (GIS), 15% skin and 12% lungs. In these cases, all of the patients had systemic symptoms with variable severities while none of them was presented with significant cutaneous lesions (6). Thus, our patient was a rare case in terms of presenting with cutaneous lesions without having a systemic symptom despite exposure to organophosphate through GIS.

Although cutaneous lesions can be seen frequently in patients presented with skin exposure, these lesions are identified rarely in the clinical course of intoxications through the oral route. Exfoliative dermatitis, photo dermatitis, erythema multiforme, urticaria, toxic epidermal necrosis, thrombocytopenic purpura, allergic rashes can be found as cutaneous findings of acute or chronic intoxications. For example, bullous lesions on the skin can be seen in 6.5% of the patients in the course of acute barbiturate poisonings (7,8).

Poisonings can be severe or mild according to the forms of organophosphate compounds. Organophosphate compounds such as methamidophos and methyl parathion cause severe toxicity while diazinon and dichlorvos cause moderate, malathion and bromophos cause mild toxicity (9). But if the patient is exposed to large amounts of organophosphates, symptom severity would increase up to coma and death (3).

In two different case reports, it has been reported that following administration of dichlorvos intramuscularly, the patients were presented with cellulitis, local abscess, and

necrosis on the skin characterized by redness, pain, and edema. Necrotic lesions caused compartment syndrome requiring fasciotomy as a result of generalized muscular necrosis. Neither patient showed systemic findings of organophosphate poisoning (10,11).

Medical history and chronic illnesses of the patients must be examined carefully and side effects and toxicities of regularly used drugs must be taken into consideration. For example, targeted therapies such as epidermal growth factor receptor inhibitors used in colorectal cancers can cause periungual paronychia, elongation of eyelashes, fissures on fingers, hyperkeratosis and acneiform rashes in the face, back and chest regions (12).

## CONCLUSION

Cutaneous lesions are rare findings in the course of intoxications through the oral route. It should be kept in mind that insecticides such as dichlorvos from the organophosphate group can also cause cutaneous lesions in the course of intoxications through the oral route. Considering that only organ damage can occur as a result of oral drug administration would be a mistake. Besides that, a detailed dermatological examination must be performed in oral intoxications.

*Conflict of interest: The authors declare that they have no competing interest.*

*Financial Disclosure: There are no financial supports.*

## REFERENCES

1. Orsini J, Din N, Elahi E, et al. Clinical and epidemiological characteristics of patients with acute drug intoxication admitted to ICU. J Community Hosp Intern Med Perspect 2017;7:202-7.

2. Yoshizawa K, Yuki M, Tsubura A. Drug-induced cutaneous toxicity. INTECH, Rijeka 2016;1-24.
3. Richter P, Corcoran J. Agency for Toxic Substances and Disease Registry. Toxicological profile for Dichlorvos. Atlanta, GA: U.S. Department of Health and Human Services, Public Health Service 1997;248.
4. Philip Wexler. Encyclopedia of Toxicology (Third Edition), Academic Press, 2014;1067-276.
5. Sonmez FT, Saritas A. Organophosphate Toxicity. Türkiye Klinikleri J Emerg Med-Special Topics 2016;2:74-80.
6. Meral C, Tuncer İ, Topal C, et al. Organik Fosfor İntoksikasyonları ile ilgili Retrospektif Araştırma. Van Tıp Dergisi 2000;7:163-68.
7. Yacoub MR, Berti A, Campochiaro C, et al. Drug induced exfoliative dermatitis: state of the art. Clin Mol Allergy 2016;14:9.
8. Keng M, Lagos M, Liepman MR, et al. Phenobarbital-Induced Bullous Lesions in a Non-Comatose Patient. Psychiatry (Edgmont) 2006;3:65-9.
9. Tuncok Y, Hocaoglu AN. Organofosfatlı insektisitlerle zehirlenme. Türkiye Klinikleri Cerrahi Tıp Bilimleri Acil Tıp Dergisi 2006;2:69-73.
10. Guloglu C, Aldemir M, Orak M, et al. Dichlorvos poisoning after intramuscular injection. Am J Emerg Med 2004;22:328-30.
11. Sabancı Ü, Aydın İ. Intramuscular injection of Dichlorvos aimed suicide: A case report. Genel Tıp Derg 2008;18:169-71.
12. Urban C, Anadkat MJ. A review of cutaneous toxicities from targeted therapies in the treatment of colorectal cancers. J Gastrointest Oncol 2013;4:319-27.