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Ruhsel Cörüt Şaban Melih Şimşek

PII: S0300-2896(24)00440-X

DOI: https://doi.org/doi:10.1016/j.arbres.2024.11.002

Reference: ARBRES 3688

To appear in: *Archivos de Bronconeumologia*

Received Date: 29 October 2024

Accepted Date: 2 November 2024

Please cite this article as: Cörüt R, Şimşek ŞM, A Rare Case of Cypermetryn Poisoning Presenting as Alveolar Hemorrhage: A Case Report, *Archivos de Bronconeumología* (2024), doi: https://doi.org/10.1016/j.arbres.2024.11.002

A Rare Case of Cypermetryn Poisoning Presenting as Alveolar Hemorrhage: A Case Report

1. Ruhsel CÖRÜT (First Author)

Orcid: 0009-0000-2196-7403

e-mail: ruhselcorut@gmail.com

Giresun University, Faculty of Medicine, Department of Chest Diseases, Giresun, Turkey

Adress: Mehmet İzmen Cd. Giresun Training and Research Hospital, 28100 Giresun/TURKEY

2. Şaban Melih Şimşek (Corresponding Author)

Orcid: 0000-0002-2897-2421

Giresun University, Faculty of Medicine, Department of Chest Diseases, Giresun, Turkey

Adress: Mehmet İzmen Cd. Giresun Training and Research Hospital, 28100 Giresun/TURKEY

Phone: +905348418337

Email: s.melih.simsek@gmail.com

To the director,

Cypermethrin (CP) is a synthetic pyrethroid that acts as a neurotoxin on pests used in large-scale commercial agriculture and household consumer products. It is a non-volatile insecticide that acts through contact and ingestion (1,2). Many animal studies eosinophilic pneumonia, allergic inflammation, pneumonitis, alveolar hemorrhage due to cypermethrin inhalation were shown (1,2). We report the first case of diffuse alveolar hemorrhage due to inhalation of this compound.

An 18-year-old male patient presented to the emergency department with hemoptysis, fatigue and dyspnea. The patient had no known systemic disease, smoked, or used illicit drugs. Chest auscultation

revealed bilateral diffuse rales and rhonchi. On admission he had an O2 saturation of 80% (in room air) and a blood pressure of 90/60 mmHg, anemia (Hemoglobin:7.2 g/dl; normal:13.5-17.5 g/dl) was observed in the laboratory parameters of the patient.

Chest X-ray showed bilateral reticular infiltrations in both lungs (Figure 1). Chest-Computed Tomographly(CT) was performed for further examination. Chest-CT showed severe ventilation narrowing in both lungs and diffuse ground-glass infiltration areas with some consolidated areas (Figure 1). In this case, viral pneumonia, pulmonary edema, interstitial pneumonitis and diffuse alveolar hemorrhage were considered.

It was learned that he sprayed his hazelnut garden with a garden spraying pump the day before. He did not use a mask or any other protective equipment during spraying. It was learnt that the pesticide used by dilution contained zeta-cypermethrin 100gr/L.

Bronchoalveolar lavage(BAL) confirmed lymphocytic alvolitis with 22% lymphocytes (normal range:<10%). The CD4/CD8 ratio was reversed in BAL (0.66; normal range:0.8-2.5). The absence of haemosiderin-laden macrophages was attributed to the 10-day window allowed for the procedure, given the patient's unstable clinical condition. BAL cell count findings were evaluated in favour of drug-related lung. Other causes of this interstitial were ruled out throug infectious disease screenings, immunological assessments ve BAL studies.

The patient was admitted to the intensive care unit and was treated 24h of oxygen, methylprednisolone 1x500mg I.V (3 days), levofloxacin 1x500 mg I.V (7 days). Afterwards, the steroid treatment was continued with 1mg/kg/day. The patient's clinical complaints and laboratory parameters improved. One month after discharge, a follow-up chest CT scan showed that the findings had decreased.

Two potential pathomechanisms are postulated to underlie the pulmonary toxicity of pyrethroids. Firstly, it has been demonstrated that pyrethroids display comparable, albeit diminished, sensitivity to pyrethroid exposure in certain mammalian voltage-gated sodium channel isoforms, as observed in insects (3). Consequently, pyrethroids have the potential to affect sodium channels in these cells, disrupt osmotic gradients and cause bronchial/epithelial mucosal oedema (4). Secondly, pyrethroid

accumulation at high concentrations may exceed the metabolic capacity of cytochrome P450 enzymes, which may cause oxidative stress and lead to cytotoxicity (5).

Although the use of pesticides is considered to be within the safe range for humans, the use of personal protective equipment is always recommended. Cases of cypermethrin-induced pneumonitis and alveolar homeragia are rarely reported. Physicians should also consider the possibility of pesticide intoxication in individuals who have been exposed to pesticides.

Funding

This research did not receive any spesific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authors' Contributions

-Ruhsel CÖRÜT: Bibliography collection. Final approval of the article.

-Şaban Melih ŞİMŞEK: Conception and writing of the article.

Conflict of interest:

The authors declare no conflict of interest.

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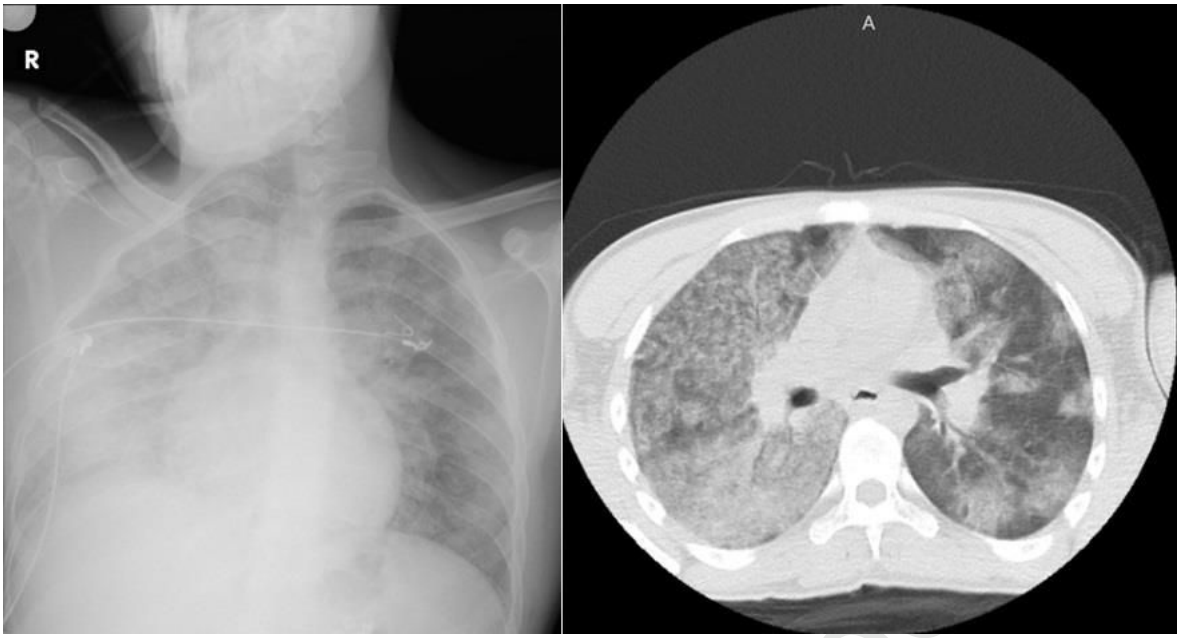

Figure 1: Thorax-CT showing bialteral diffuse ground glass opacities