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From Itching to Poisoning: The Deadly Cost of Misguided Pest Control in Iran's Households, A Case Report

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Abstract

Background: Pediculosis, or lice infestation caused by Pediculus humanus capitis, is a common parasitic condition affecting children worldwide, including in Iran. This case report focuses on a 3-year-old girl who experienced acute organophosphate poisoning due to the misuse of an organophosphate pesticide for treating pediculosis.

Case Presentation: The child's mother applied an organophosphate spray (Diazinon) to the child's scalp to treat the lice infestation. Within minutes of application, the child began exhibiting symptoms of poisoning, leading to her hospitalization in the emergency department. Upon arrival, the child was evaluated for vital signs and clinical symptoms, including excessive sweating, shortness of breath, nausea, and increased salivation. The treatment regimen included the administration of atropine, pralidoxime, and supportive care. On clinical examination, the child's vital signs were stable. However, laboratory tests revealed significantly low cholinesterase levels. The serum cholinesterase level was 1200 IU/lit (normal range > 4000 IU/lit), and the RBC cholinesterase level was 0.7 IU/lit (normal range > 4 IU/lit). These findings confirmed the diagnosis of organophosphate poisoning. The child was treated with atropine, pralidoxime, and supportive management, and after 48 hours, her condition improved, and she was discharged in stable health.

Conclusion: This case report highlights the serious consequences of improper use of chemical pesticides, especially in households without adequate knowledge or access to proper medical facilities. The report emphasizes the importance of safe treatment options for pediculosis, such as topical permethrin, and calls for greater awareness and education on the risks associated with misusing harmful chemicals. Effective management of pediculosis should involve safe, accessible treatment alternatives and targeted educational efforts to prevent the misuse of dangerous substances in the home.

Key Words: Children, Cholinesterase, Organophosphate, Poisoning, Pesticide safety.

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1- INTRODUCTION

Pediculosis, or lice infestation, is a common parasitic condition that primarily affects children worldwide. One of the most common causes of lice infestations is Pediculus humanus capitis, also known as the head louse. While not usually a serious threat to health, pediculosis can cause significant discomfort, itching, and in some cases, secondary bacterial infections due to excessive scratching. Many households turn to chemical pesticides, such as organophosphate-based sprays, in search of quick solutions. However, improper or excessive use of such chemicals can lead to severe poisoning, as illustrated by a recent case of acute organophosphate poisoning in a 3-year-old girl.

This case report highlights the potentially fatal consequences of misusing organophosphate pesticides, emphasizing the need for safer treatment alternatives and better awareness of the risks associated with chemical treatments for lice.

2- CASE PRESENTATION

A 3-year-old girl from Iran presented with acute symptoms of poisoning after her mother applied an organophosphate pesticide (Diazinon) to treat head lice. The pesticide, a commonly used insecticide, was sprayed directly onto the child's scalp in an attempt to rid her of lice. Within minutes of the application, the child began to show signs of poisoning, including excessive sweating, nausea, shortness of breath, and increased salivation. The mother immediately sought medical help, and the child was rushed to the emergency department.

- Upon arrival at the hospital, the child was assessed for clinical symptoms (pinpoint pupils, diaphoresis, bilateral wheezing). and vital signs (HR: 110 bpm, RR: 35, BP: 90/60 mmHg, SpO_2: 96% on room air)
- The emergency medical team quickly suspected organophosphate poisoning due to the rapid onset of symptoms following exposure to the pesticide. Organophosphates, like Diazinon, inhibit the enzyme acetylcholinesterase, leading to the accumulation of acetylcholine at nerve synapses and causing overstimulation of cholinergic pathways. This overstimulation results in a wide range of symptoms, including respiratory distress, muscle weakness, and excessive secretions, almost all of which were evident in the child.

Diagnosis

In the child's examination, the clinical symptoms were consistent with muscarinic symptoms resulting from organophosphate poisoning, and the results of serum and red blood cell cholinesterase levels also confirmed this issue. Specifically, the child's serum cholinesterase level was measured at 1200 IU/L, which was far below the normal range (4,000 IU/L). The RBC (red blood cell) cholinesterase level was also markedly low at 0.7 IU/L (normal range > 4 IU/L). These findings confirmed the inhibition of acetylcholinesterase, characteristic of organophosphate poisoning (1-4) (Figure 1).

Treatment

The child was immediately started on an appropriate treatment regimen, which included the administration of atropine, 0.05 mg/kg IV bolus, followed by titrated doses to control secretions and Pralidoxime: 25 mg/kg IV, then 8mg/kg/hr for 48 hours, along with supportive care. Atropine, an anticholinergic agent, is used to counteract the effects of acetylcholine accumulation, particularly the muscarinic symptoms such as excessive salivation,

sweating, and respiratory distress. Pralidoxime was administered to reactivate the inhibited acetylcholinesterase enzyme and restore normal cholinergic function. Additionally, supportive care, such as oxygen therapy and fluid resuscitation was provided. In addition to these pharmacological interventions, the child was monitored closely for any signs of respiratory failure or other complications (5).

After 48 hours of intensive treatment and observation, the child's condition stabilized, and she was discharged in good health. Her symptoms improved significantly, and follow-up tests showed a return to near-normal levels of cholinesterase activity.

3- DISCUSSION

This case underscores the potential dangers associated with the improper use of chemical pesticides, particularly in the home environment where there may be limited knowledge about the risks of such substances. Organophosphate poisoning can be life-threatening, and the misuse of these chemicals for common conditions such as pediculosis highlights a significant gap in public awareness about the safe use of pesticides.

In the case of pediculosis, safer and more effective treatments such as topical Permethrin, wet combing, Ivermectin, and Dimeticon are widely available and recommended by health authorities. Permethrin, a synthetic insecticide with minimal toxicity to humans, is considered the first-line treatment for lice infestations. Other safe options include manual removal (combing) and, in some cases, over-the-counter pediculicides. These alternatives offer safer, more reliable methods to control lice without the risks associated with toxic chemical exposure (6-9).

Figure-1: Pediculus humanus capitis.

4- CONCLUSION

This case report serves as a cautionary tale about the risks of using harmful chemicals, such as organophosphate pesticides, in the home. The misuse of pesticides can have severe consequences, particularly for vulnerable populations like young children. It highlights the need for public education on safe treatment options for common conditions like pediculosis and emphasizes the importance of avoiding toxic substances in the home. Ensuring greater access to safe, effective treatments and promoting awareness about the dangers of pesticide misuse are crucial steps in preventing similar cases of poisoning.

Healthcare providers, parents, and caregivers should be educated on the proper use of chemical agents and the availability of safer, more effective treatments. Additionally, regulatory bodies should continue to monitor and restrict the use of harmful substances, ensuring that families have access to safer alternatives in the fight against pediculosis.

5- REFERENCES

1. World Health Organization. Guidelines for the Management of Pediculosis Capitis.2023.

2. Abdel Baseer KA, Gad EF, Abdel Raheem YF. Clinical profile and outcome

of acute organophosphate poisoning in children of Upper Egypt: a cross-sectional study. BMC pediatrics. 2021 Feb 26;21(1):98.

3. Yousef A, Albuali W, AlOmari M, AlMutairi A, Albuali HW, AlQurashi FO, et al. Organophosphate poisoning in a paediatric intensive care unit: a retrospective analysis based on ten years of experience. International journal of general medicine. 2022 Jul 21;15:6269.

4. Sharma N, Nin-Gonzalez R. Organophosphate poisoning in a young child: a case report. Oxford medical case reports. 2021 Feb;2021(2):omaa137.

5. Hoffman RS, Gosselin S, Nelson LS et al INSECTICIDES: ORGANIC PHOSPHORUS COMPOUNDS AND CARBAMATES in Goldfrank's CLINICAL MANUAL OF TOXICOLOGIC EMERGENCIES 2ND Ed. McGraw-Hill.2024; 584-585

6. Stough D, Shellabarger S, Quiring J, Gabrielsen Jr AA. Efficacy and safety of spinosad and permethrin creme rinses for pediculosis capitis (head lice). Pediatrics. 2009 Sep 1;124(3):e389-95.

7. Leung AK, Lam JM, Leong KF, Barankin B, Hon KL. Paediatrics: how to manage pediculosis capitis. Drugs in Context. 2022 Mar 14;11:2021-11.

8. Apet R, Prakash L, Shewale KH, Jawade S, Dhamecha R, Lekhavardhini P, et al. Treatment modalities of pediculosis capitis: a narrative review. Cureus. 2023 Sep 11;15(9).

9. Rahmayunita G, Pertiwi LK, Ascobat P, Widaty S. Efficacy and safety of 1% and 5% permethrin lotion as treatment for pediculosis capitis in children: A double blind randomized controlled study.