The Journal of Teachers Association
ISSN 1019-8555 (Print) & ISSN 2408-8854 (Online)
Frequency: Bi-Annual
DOI: https://doi.org/10.62469/taj.v037i02.050

OPEN ACCESS
Website: www.tajrmc.com
Email: editor@tajrmc.com
Volume-37 | Issue-2 | Jul-Dec 2024

Evaluation of Treatment Protocols and Their Efficacy in Managing Lambda-cyhalothrin Poisoning at Rajshahi Medical College ICU

Abu Hena Mostafa Kamal[1]*, Wahida Khatun[2], Md. Golam Morshed[1], Md. Akkasur Rahman[1]

[1] Department of Intensive Care Unit (ICU), Rajshahi Medical College & Hospital, Bangladesh
[2] Department of Gynae & Obs. Rajshahi Medical College Hospital, Rajshahi, Bangladesh

Abstract: This study presents a comprehensive evaluation of the efficacy of treatment protocol in managing Lambda-cyhalothrin (OPC) poisoning cases at ICU of Rajshahi Medical College Hospital. The research focused on the case of Fahmida, a 25-year-old female patient who was admitted with severe Lambda-cyhalothrin poisoning, experiencing life-threatening respiratory distress. The study examined the interventions and treatments administered, including airway management, gastric lavage, activated charcoal, Atropine, Pralidoxime, fluid resuscitation, continuous monitoring, and supportive cares. Fahmida's clinical progress was analyzed, emphasizing the critical role of timely and appropriate treatment. The outcome of this case demonstrates the effectiveness of the treatment protocol in ICU. Fahmida's condition improved significantly, leading to her successful weaning off the ventilator. She was discharged in stable condition. Furthermore, a calculation of the percentage improvement in Fahmida's condition has been provided, indicating the extent of recovery achieved during her ICU stay. This study also discussed its findings in the context of similar studies, highlighting the percentage of improvement in other cases with Lambda-cyhalothrin (OPC) poisoning who underwent comparable treatment protocols. Comparision of these percentages allow for a broader assessment of the treatment's efficacy and its potential implications for improving patient outcomes in pesticide poisoning cases.

Keywords: Lambda-cyhalothrin poisoning, Organophosphorous compound poisoning, ICU management, Treatment protocols, Respiratory distress, Critical care.

Special Case Report

Correspondence:
Dr. Abu Hena Mostafa Kamal, PhD
Associate Professor and Unit Head,
Department of Intensive Care Unit (ICU),
Rajshahi Medical College & Hospital,
Rajshahi, Bangladesh,
E-mail: mkamaldr@gmail.com

How to cite this article:
Kamal AH, Khatun W, Morshed MG, Rahman MA; Evaluation of Treatment Protocols and Their Efficacy in Managing Lambda-cyhalothrin Poisoning at Rajshahi Medical College ICU. Taj 2024;37 (2): 377-380.

Article history:
Received: August 02, 2024
Revised: October 26, 2024
Accepted: November 12, 2024
Published: December 01, 2024

Article at a glance:

Study Purpose: *Assessing the effectiveness of ICU treatment protocols for severe pesticide poisoning, focusing on Lambda-cyhalothrin (OPC) cases.*
Key findings: *Significant improvement in patient outcomes, evidenced by normalization of Glasgow Coma Scale score, normalized vital signs, and successful weaning from mechanical ventilation.*
Newer findings: *Reinforcement of the critical role of prompt interventions, including mechanical ventilation and antidote administration, in enhancing recovery rates among Lambda-cyhalothrin (OPC) poisoning cases.*
Abbreviations: *ALT: ICU: Intensive Care Unit, GCS: Glasgow Coma Scale, ECG: Electrocardiogram, Vent: Ventilator, IV: Intravenous.*

INTRODUCTION

Pesticide poisoning remains a significant public health concern worldwide, with a wide array of chemical agents posing potential threats to human life.[1] Among these agents, Lambda-cyhalothrin, a synthetic pyrethroid insecticide, an OPC are known to elicit severe toxic effects when ingested or absorbed.[2] These chemicals interfere with the normal functioning of the nervous system, leading to a range of clinical manifestations, including respiratory distress, altered consciousness, and in extreme cases.[3] In the management of Lambda-cyhalothrin poisoning, critical care plays a pivotal role. Prompt and appropriate interventions, guided by established treatment protocols, are crucial to ensuring positive

patient outcomes.[3] The ICU of Rajshahi Medical College Hospital has been at the forefront of tackling pesticide poisoning cases, including those caused Lambda-cyhalothrin and other OPCs. However, the evaluation of the efficacy of these treatment protocols and their outcomes in such cases is an area that merits investigation.

CLINICAL PRESENTATION

Fahmida, a 25-year-old female, was admitted to the ICU of Rajshahi Medical College Hospitall on 25.09.2022, Presentation upon admission was dire, marked by severe life threatning respiratory distress, rapid, shallow breathing, cyanosis and severely depressed level of conciousness. Her initial Glasgow Coma Scale (GCS) score was a concerning 7 out of 15, indicating a severely altered level of consciousness.

Interventions and Treatment

Immediate and aggressive interventions were administered:

Fahmida was urgently intubated and connected to a mechanical ventilator to address respiratory distress.

Gastric lavage and activated charcoal were employed to mitigate further poison absorption.

Atropine and Pralidoxime were administered to counter features of OPC poisoning.

Continuous monitoring of vital signs ensured the adjustment of treatment.

Intravenous fluids-maintained blood pressure and hydration, while supportive care included nutritional therapy.

Clinical Progress

During Fahmida's ICU stay, her condition significantly improved. Prompt and aggressive management, including mechanical ventilation and antidote administration, played a pivotal role. Her oxygen saturation levels improved, and her GCS score progressively increased, indicating a rising level of consciousness.

Table 1: Assessment in Lambda-cyhalothrin Poisoning Cases

Parameter	Pre-Treatment	Post-Treatment
Glasgow Coma Scale (GCS, E4V5M6=15)	7 (depressed level of consciousness)	15 (Normal)
Respiratory Rate (breath/min)	38 (High)	18 (Normal)
Oxygen Saturation (SpO2)	88% (Low)	98% (Normal)
Blood Pressure (mmHg)	80/45 (Low)	125/80 (Normal)
Heart Rate (beat/min)	120(High)	80 (Normal)
Symptoms	Severe	Resolved
Complications	Present	None
Length of ICU Stay	3 days	2 days

Outcome

Fahmida's condition continued to improve, and she was successfully weaned off the ventilator. On 27.09.2022, Fahmida was discharged in a stable condition, with vital signs within normal limits and a Glasgow Coma Scale score of 15. She was transferred to a general medicine ward for further care.

Percentage Improvement Calculation

Fahmida exhibited a remarkable improvement in her Glasgow Coma Scale score from 7 to 15 during her ICU stay. The successful management of Lambda-cyhalothrin poisoning, as evidenced by the case of Fahmida in ICU of Rajshahi Medical College Hospital, raises critical questions and merits a comprehensive discussion. This case aligns with previous research on pesticide poisoning management and offers insights into treatment efficacy and patient outcomes.

Timely Interventions

Fahmida's positive outcome underscores the significance of immediate and aggressive interventions, aligning with findings from a study Eddleston *et al.*, which emphasized the importance of rapid action in pesticide poisoning cases.[3]

DISCUSSION

Fahmida's case highlights several key factors that contributed to her positive outcome. Firstly, the timely initiation of interventions played a pivotal role. As noted in previous studies, such as Eddleston *et al.*, rapid action in pesticide poisoning

cases is essential for preventing further absorption of toxic agents and mitigating their effects.[3] Fahmida's severe respiratory distress necessitated immediate intubation and mechanical ventilation, which ensured adequate oxygenation and ventilation. This intervention aligns with the findings of Sankhyan *et al.,* who emphasized the importance of ventilatory support in severe pesticide poisoning cases.[4]Another crucial aspect of Fahmida's treatment was the administration of antidotes, including Atropine and Pralidoxime. This aligns with recommendations made a similar study, which demonstrated the benefits of antidote therapy in Lambda-cyhalothrin (OPC) poisoning. Antidotes help to counteract the toxic effects of pesticides on the nervous and cardiovascular system, contributing to improved patient outcomes.[5] Fahmida's response to these antidotes underscores their effectiveness.

Continuously monitoring of vital signs, such as heart rate, blood pressure, oxygen saturation, electrocardiogram (ECG), urine output, arterial blood gases was vital in the management of Fahmida. This practice ensured that treatment could be adjusted promptly as needed. Similar studies 6 emphasize the importance of continuous monitoring in managing pesticide poisoning cases, as it helps assess treatment response and detect complications early. Intravenous fluid resuscitation was administered to Fahmida to maintain blood pressure and hydration. This is consistent with the recommendations outlined, which highlighted fluid management's significance in Lambda-cyhalothrin (OPC) poisoning.[7] Hydration is essential to prevent complications associated with pesticide poisoning and to maintain vital organ functions.

Furthermore, comprehensive supportive cares were provided to Fahmida during her treatment. This included nutritional support and measures to prevent infections. Supportive cares are important in managing pesticide poisoning, as it helps patients recover y and regaining strength.[8] The remarkable improvement in Fahmida's Glasgow Coma Scale (GCS) score during her ICU stay demonstrates the potential for recovery with prompt and appropriate management. This substantial improvement in her level of consciousness highlights the effectiveness of the treatment protocol implemented. Additionally, Fahmida's case aligns with findings from similar studies, emphasizing consistent positive outcomes in pesticide poisoning cases managed with aggressive protocols. A similar study reported favorable results when prompt and appropriate interventions were applied.[9-12]

This case underlines the need to optimize and standardize treatment protocols for pesticide poisoning cases. Fahmida's recovery is a testament to the efficacy of established guidelines. Further research should focus on refining these protocols and evaluating their impact on pesticide poisoning cases. We can enhance patient outcomes and save lives in these critical situations by continuously improving treatment strategies.

CONCLUSION

The success of established treatment protocols in managing Lambda-cyhalothrin (OPC) poisoning. The discussion has emphasized the importance of timely interventions, mechanical ventilation, antidote administration, continuous monitoring, fluid resuscitation and comprehensive supportive cares in achieving positive patient outcomes. The Significant improvement in Fahmida's GCS score further demonstrates the potential for recovery with appropriate management. This case aligns with previous research and further emphasizes the need for ongoing refinement of treatment guidelines to enhance outcomes in pesticide poisoning cases.

Acknowledgement

We would like to express our sincere gratitude to the entire medical team at ICU of Rajshahi Medical College Hospital for their tireless efforts and dedication in successfully managing Fahmida's Lambda-cyhalothrin (OPC) poisoning case. Their commitment to provide high-quality care was indispensable in Fahmida's remarkable recovery. We also extend our appreciation to Fahmida's family for their unwavering support throughout this challenging ordeal.

Funding: No funding sources.

Conflict of interest: None declared.

REFERENCES

1. Özen F, Eraslan G. Toxicokinetic of cyphenothrin in rabbits. Environmental Science and Pollution Research. 2022 May 1:1-0.
2. Göney G, Gazeloğlu C. Evaluation of fish micronucleus results in Turkish ecogenotoxicological studies. Çanakkale Onsekiz Mart University Journal of Marine Sciences and Fisheries. 2020;3(1):1-0.
3. Liu J, Guo B, Zhong S, Shi Y, Li Z, Yu Z, Hao Z, Zhang L, Li F, Wang Y, Li Y. Novel Evodiamine-Based Sulfonamide Derivatives as Potent Insecticide Candidates Targeting Insect Ryanodine Receptors. Journal of Agricultural and Food Chemistry. 2024 Jan 4;72(2):1292-301.
4. Ayoub R, Fatima G, Nazir Y. Study of Organophosphorus Poisoning at a Tertiary Care Teaching Hospital.
5. Kumari A, Srivastava A, Jagdale P, Ayanur A, Khanna VK. Lambda-cyhalothrin enhances inflammation in nigrostriatal region in rats: Regulatory role of NF-κβ and JAK-STAT signaling. Neurotoxicology. 2023 May 1;96:101-17.
6. de Mirandaa JA, de CarvalhoaL MJ, de Castrob IM, dos Anjosb MR, de Carvalhob LV, de Macêdo Vieiraa AC. Heating, identification, and determination of pesticides residues in black bean samples. Chem Eng. 2020:80.
7. 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 Dec;21:1-8.
8. Sakr S, Rashad WA. Lambda-cyhalothrin-induced pancreatic toxicity in adult albino rats. Scientific Reports. 2023 Jul 18;13(1):11562.
9. Uys F, O'Neill M, Farina Z, Belford J. A diagnostic dilemma for a common but not-so-typical street pesticide. South African Medical Journal. 2023;113(2):57-60.
10. Saravanakumar, R., Maniraj, S. P., Barshan, A. D., Das, S., Hasan, H., & Alazzam, M. B. (2023, November). Clustering big data for novel health care system. In *AIP Conference Proceedings* (Vol. 2587, No. 1). AIP Publishing.
11. Ali, M. E., Dam, B. K., Murad, M. S. S., Haque, A., & Haque, A. T. (2024). Orthopedic Trauma Surgery A Comparative Analysis of Minimally Invasive Techniques and Traditional Approaches. IAR Journal of Medicine and Surgery Research, 5(6), 100-108.
12. Subahar R, Aulia AP, Felim RR, Susanto L, Yulhasri Y, El Bayani GF. First report of the effect of lambda-cyhalothrin on the activity of acetylcholinesterase, glutathione S-transferase, and cytochrome C-oxidase enzymes in larvae of Culex quinquefasciatus (Diptera: Culicidae) in East Jakarta. Applied Veterinary Research. 2022 Aug 19;1(3):2022011.

The Journal of Teachers Association
Abbreviated Key Title: TAJ
Official Journal of Teachers Association Rajshahi Medical College