Original Article

Case report on Organophosphate Poisoning with hypovolemic shock

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Abstract

Background: Organophosphate poisoning can result from occupational or accidental exposure, intentional ingestion, or chemical warfare with nerve agents. Symptoms vary widely due to differences in dosage, drug toxicity, and mode of exposure. Of the 44 patients, features of the intermediate syndrome were observed in 40 (90.9%) of 95% of her CI patients (84.2 97.6) in the study. A frequency of intermediate syndrome signs such as weakness in neck flexion, inability to sit, and difficulty swallowing was observed in patients. The observed mortality in this study was 2 of his inpatients (4.5%). Case presentation: -A 52-year-old male who had ingested pesticide while spraying a farm was involved in an accident by a relative. He also had a cut on his right wrist from his older brother. He had 2-3 episodes of vomiting per day and had a generalized weakness. He was taken to hospital. He has struggled with chronic alcoholism for 15 years. He was admitted to the intensive care unit for further treatment. WBC raised (17800) in the blood study, but haemoglobin dropped (9.6), calcium levels dropped (7.2), and creatinine rose. The GCS score for the physical examination is 12. Constricted pupils in the eyes, tightness in the chest, wheezing, increased sweating, salivation, and lacrimation, as well as GI symptoms like nausea, vomiting, cramps, watery diarrhoea, and involuntary urine and defecation. He received Emset, antibiotics, and gastric lavage as treatment. Patients' conditions improve after treatment. Conclusion: -Insecticide ingestion results in organophosphate poisoning and hypovolemic shock. The diagnosis of parenteral OP compound poisoning is difficult. The onset of symptoms may be delayed, and they may show differently than usual. He experienced a hypovolemic shock as a result of significant blood loss from a cut wound.

Keywords: Poisoning, Organophosphate (OP), Carbamates, Acetylcholinesterase.

Introduction

Organophosphate (OP) chemicals have recognisable harmful effects and are frequently employed as suicide agents(1). Since at least 1958, when 100 people perished after eating flour tainted with the organophosphorus (OP) insecticide parathion, pesticide poisoning has been a significant issue in India(2). In India, there are thought to be 230,000 suicides annually, of which 70,000 (or 30%) include pesticides(3). In the initial phase of poisoning, cardiac arrhythmias are frequently seen; another condition that is known to happen is late-onset polymorphic ventricular tachycardia with a prolonged QT interval on the ECG(4).

But there haven't been any cases of late-onset, protracted asystole without prior arrhythmias and after acute toxicity subsided. Organophosphorus pesticides and organophosphate nerve agents can block acetylcholinesterase, which can lead to acute parasympathetic system malfunction, muscular weakness, convulsions, coma, and respiratory failure(5).

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How to cite this article: Shardul Timande, Shalini Moon, Archana Teltumbde, Aniket Pathade, Case report on Organophosphate Poisoning with hypovolemic shock, J PHARM NEGATIVE RESULTS 2022;13: 1052-1055.

Access this article online

Quick Response Code:

Website: www.pnrjournal.com

DOI: 10.47750/pnr.2022.13.03.168

Patient presentation

We are presenting the case of a male 52 years old, who had a history of ingesting insecticide while spraying it on his farm and was brought in as a casualty by his relatives. His older brother had likewise cut him on the right wrist. According to the relative's account, the patient left home at seven in the morning. And discovered on the ground, unconscious. He saw a way to save his younger brother, so he chopped his hand to stop the poison from spreading throughout the body. As a result of the considerable bleeding, the patient experienced a hypovolemic shock. After then, a relative brought the patient to the hospital, where he underwent several investigations. The patient had seizures and sensory changes, vomiting 2-3 times, drowsiness, and blurred vision.

On admission, he was restless and in a postictal state. The patient was transferred to MIC for further treatment. Vital signs His signs showed pulse rate 68/min, blood pressure 120/80 mmHg, respiratory rate 14/min, afebrile, profuse oral discharge. A neurological examination revealed his GCS to be 7/15 with reduced movement in all extremities. Pupils were pinpointed bilaterally with no doll's eye movement. The plantar reflex was a bilateral extension. Deep tendon reflexes were blunted. There was no fasciculation and no odour of the surgical compound. Other system checks were normal.

On admission, laboratory tests revealed normal renal function, liver function, and serum sodium, potassium, calcium, and magnesium levels. ryles tube suction was performed on admission, and gastric lavage and Foley insertion were performed every 6 hours. Treatment has been given which includes blood transfusions, and drugs such as Atropine and Emset, fluid administration were given to prevent hypovolemic shock. After 12 days of observation, the patient was able to speak. He revealed that he had injected poison with suicidal intent, and all legal protocols were followed according to hospital rules. Poison injection proved to be an impulsive act due to inadequacy.

Discussion

Organophosphate poisoning (OP) is a disorder that is frequently observed in various nations. OP poisoning typically exhibits indications of increased cholinergic activity. It seldom affects other organ systems, but when it does, the prognosis for the patient as a whole can get worse. Emetics and Gastric Gavage were given to the patient to remove poison from the body and also IV fluids and Antibiotics were given. (6). The clinical presentation and output of OP poisoning are affected not only by the pesticide, but also by the dose, method of administration, and time between intoxication and treatment initiation. Organophosphate pesticides (OPS) can cause cholinergic dysfunction and affect human and animal health(7-13).

Studying pesticides in water and soil is a true way to uncover pesticide use in agriculture. Poisoning deaths are caused by respiratory arrest and ventilator-related complications. Mortality and morbidity from organophosphate poisoning remain significant in rural areas with few or no critical care facilities. It is a highly toxic, water-soluble pesticide with moderate dermal absorption and high oral absorption. Ingestion is the most familiar mode of exposure in intentional self-harm. Several cases of intravenous, intramuscular, as well as subcutaneous insecticide administration with local and systemic manifestations have been reported. However, what differentiates this case from others is that it is associated with hypovolemic shock. Due to a lack of personal knowledge, he cut his hand and the patient went into hypovolemic shock due to massive bleeding. Clinical features of OP posing include (i) Acute cholinergic crisis. Acetylcholine accumulation at muscarine and nicotine sites and accumulation in the CNS result in headache, dizziness, seizures and altered sensations. (ii) an intermediate syndrome that develops after 24 to 96 hours due to prolonged activity of acetylcholine at nicotinic receptors, causing muscle weakness in the eyes, throat, limbs, and respiratory system(14-23).

Atropine is administered as a loading dose of 2-5 mg, repeated every 5-10 minutes until signs of atropination appear. It is then administered as an infusion at a rate of 0.02-0.08 mg/kg/min and the dose is titrated according to clinical response. Legal issues are important when dealing with cases of this kind. If poisoning is suspected, gastric washings, excrement, empty bottle caps and liquids should be collected and stored. This matter was registered in the medical statutory register and reported to the police. C. Dharmani and K. Jaga et al explain how these insecticides are used, exposure to OPs in hazardous quantities can cause acute poisoning, which has grown to be a significant public health concern. The commonly employed OP compounds are less hazardous, reasonably safe, and very biodegradable in comparison to organochlorine pesticides. (24-33)

Conclusion

In this case, surgery is associated with hypovolemic shock. Due to the profuse bleeding, it was difficult to maintain fluid levels in the body. The toxicity of OP compounds via parenteral administration is a diagnostic challenge. The onset of symptoms could be delayed, and the presentation could be unusual. Even if the symptoms are mild at first, long-term monitoring is required. Due to the lack of decontamination measures, even a small injection can be lethal. If surgical toxins are suspected, treating health care providers should be vigilant and introduce appropriate treatment.

References

1- Feldman S, Henry JA, Karalliedde L, Marrs T. Organophosphates And Health. World Scientific; 2001. 511 p.
2- Tsokos M. Forensic Pathology Reviews. :71.
3- Eddleston M, Karunarathne A, Gunnell D, Konradsen F. Response to

Bayer regarding pesticide suicides. Clin Toxicol. 2020 Aug 2;58(8):859–60.
4- Nguyen PT, Scheinman MM, Seger J. Polymorphous ventricular tachycardia: clinical characterization, therapy, and the QT interval. Circulation. 1986 Aug;74(2):340–9.
5- Respiratory Complications of Organophosphorus Nerve Agent and Insecticide Poisoning. Implications for Respiratory and Critical Care | American Journal of Respiratory and Critical Care Medicine [Internet]. [cited 2022 Aug 22]. Available from: https://www.atsjournals.org/doi/full/10.1164/rccm.201406-1150CI
6- Paul H, Steinbrecher R, Michaels L. Hungry Corporations: Transnational Biotech Companies Colonise the Food Chain. Zed Books; 2003. 262 p.
7- Eyer P. The Role of Oximes in the Management of Organophosphorus Pesticide Poisoning. Toxicol Rev. 2003 Sep 1;22(3):165–90.
8- 20-4-Review_Article.pdf [Internet]. [cited 2022 Aug 22]. Available from: http://archive.nmji.in/archives/Volume_20/Number_4/PDF_20_4/20-4-Review_Article.pdf
9- C. Dharmani, K. Jaga. Epidemiology of Acute Organophosphate Poisoning in Hospital Emergency Patients. Rev Environ Health. 2005 Jul 1;20(3):215–32.
10- Narang, Simran, Pratik Phansopkar, Laukik Vaidya, Neha Chitale, and Dushyant Bawiskar. "Bridging the Gap between Locking Compressive Plate, Skin Grafting and Rehabilitation for Tibia Fracture: A Case Report." Journal of Pharmaceutical Research International, July 15, 2021, 284–91. https://doi.org/10.9734/jpri/2021/v33i37A32010.
11- Narayane, Madhavi Madhukar. "Benefits of Online Doctor Consultation During the Pandemic." Bioscience Biotechnology Research Communications 14, no. 6 (June 15, 2021): 53–56. https://doi.org/10.21786/bbrc/14.6.13.
12- Nashine, Rupam R., Amit R. Nayak, Aliabbas Husain, Gargi D. Mudey, Hatim F. Daginawala, Lokendra Singh, and Rajpal S. Kashyap. "Development of an Improved Whole Blood Assay for Diagnosis of Latent and Active Tuberculosis Cases." Journal of Pharmaceutical Research International, July 27, 2021, 197–209. https://doi.org/10.9734/jpri/2021/v33i38B32115.
13- Nathani, Harsh, Medhavi V. Joshi, and Pratik A. Phansopkar. "Impact of Early Rehabilitation in a Complex Case of Non-Union of Tibial Plafond Fracture with Osteosynthesis Associated Infection – A Case Report." Journal of Pharmaceutical Research International, November 24, 2021, 55–61. https://doi.org/10.9734/jpri/2021/v33i51B33511.
14- Nayak, Sushanth Ramanath, Meenakshi Pate Yeola, Samatha Ramanath Nayak, Kratika Kamath, and Pratikshit Singh Raghuwanshi. "Role of Focused Assessment with Sonography for Trauma in the Assessment of Blunt Abdominal Trauma – A Review." Journal of Evolution of Medical and Dental Sciences 10, no. 1 (January 4, 2021): 45–50. https://doi.org/10.14260/jemds/2021/9.
15- Ngente, Elizabeth Remsangzuali, Vaibhav Chaudhari, Nita Fodekar, Pranali Gathe, Samiksha Ghume, Shruti Jambhulkar, and Kavita Gomase. "Protocol on Effect of Planned Teaching on Knowledge Regarding Menstrual Blood Banking among Nursing Students." Journal of Pharmaceutical Research International, December 15, 2021, 220–24. https://doi.org/10.9734/jpri/2021/v33i58A34109.
16- Nikose, Sunil Sheshrao, Devashree Nikose, Shashank Jain, Aditya Kekatpure, Kiran Saoji, Rahul Chaudhary, and Gajanan Pisulkar. "Determinants of Regeneration and Strength of Hamstrings after Anterior Cruciate Ligament Reconstruction—Fate of Hamstring Tendon." International Orthopaedics 45, no. 7 (July 2021): 1751–60. https://doi.org/10.1007/s00264-020-04932-z.
17- Nilima, Thosar, Wayakar Rutuja, and Sphurti Pramod Bane. "Evaluation of Co-Relation between Maternal Behavior Characteristics and Early Childhood Caries in Children of Wardha District." Journal of Pharmaceutical Research International, October 26, 2021, 245–53. https://doi.org/10.9734/jpri/2021/v33i47A33010.
18- Nimbulkar, Gargi C., Kumar G. Chhabra, Shravani Deolia, and B Unnikrishnan. "Public Health Dentist: An Untapped Potential during COVID-19 Pandemic." The Open Dentistry Journal 15, no. 1 (July 12, 2021): 296–99. https://doi.org/10.2174/1874210602115010296.
19- Nimonkar, Sharayu, Surekha Godbole, Vikram Belkhode, and Pranali Nimonkar. "Evaluating the Effect of Complete Dentures on Signs and Symptoms of Temporomandibular Disorders Analyzed by Craniomandibular Index in Completely Edentulous Patients- A Study Protocol." Journal of Pharmaceutical Research International, August 6, 2021, 242–50. https://doi.org/10.9734/jpri/2021/v33i40A32240.
20- Nirmal, Apoorva, Gajendra Agrawal, Sunil Kumar, Sourya Acharya, Akshay Dafal, and Dwivedi Bhushan. "Echocardiographic Assessment of Cardiac Function in Liver Cirrhosis: A Cross-Sectional Study." JOURNAL OF CLINICAL AND DIAGNOSTIC RESEARCH, 2021. https://doi.org/10.7860/JCDR/2021/45792.14881.
21- Nisargandha, Milind Abhimanyu, and Shweta Dadarao Parwe. "Evaluation of Spermatogenic Action in the Management of Oligospermia." International Journal of Pharma and Bio Sciences 11, no. 2 (April 15, 2021): 218–23. https://doi.org/10.22376/ijpbs/lpr.2021.11.2.P218-223.
22- "[No Title Found]." INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES AND RESEARCH 12, no. 1 (n.d.).
23- Padmane, Ekta, and Samruddhi Gujar. "Case Report on Hydatid Cysts with Hydropnemonothorax." Journal of Pharmaceutical Research International, November 15, 2021, 1–5. https://doi.org/10.9734/jpri/2021/v33i50A33375.
24- Padmawar, Shubham, Dr. Suhas Landge, Prateek Upadhyay, and Mitali Madhusmita. "A Functional and Radiological Outcome Analysis of Hip Forage Procedure, Done for Early Stages(Ficat and Arlet Grade 1 and 2A) of Avascular Necrosis of Head of Femur." Journal of Pharmaceutical Research International, December 11, 2021, 97–105. https://doi.org/10.9734/jpri/2021/v33i54B33770.
25- Palkrit, Sakshi, Waqar M. Naqvi, and Tasneem Burhani. "Physiotherapeutic Approach in Stress Urinary Incontinence with Prolapsed Uterus: A Case Report." Journal of Pharmaceutical Research International, June 30, 2021, 54–59. https://doi.org/10.9734/jpri/2021/v33i34A31822.
26- Panbude, Mahima Dipak, Mayuri Manikrao Paropate, Mansi Vinod Pande, Priyanka Dayaram Pal, Chatur Kamlakar Patil, and Ranjana Premnath Sharma. "Evaluation of Effectiveness of Information Booklet Regarding Self-Care among Patients Receiving Chemotherapy in Selected Hospitals of Wardha and Nagpur, India." Journal of Evolution of Medical and Dental Sciences 10, no. 18 (May 3, 2021): 1329–33. https://doi.org/10.14260/jemds/2021/280.
27- Pandey, Aishvarya. "Neuroligical Disorders Due To Malnourishments." Bioscience Biotechnology Research Communications 14, no. 6 (June 15, 2021): 45–48. https://doi.org/10.21786/bbrc/14.6.10.
28- Pandey, Milind, Sunita Vagha, Raunak Kotecha, and Anchal Manchanda. "Primary Gastric Lymphoma (Diffuse Large B Cell Type)." Journal of Pharmaceutical Research International, July 13, 2021, 54–57. https://doi.org/10.9734/jpri/2021/v33i37A31979.
29- Pandey, Milind, Sunita Vagha, Gaurav Mahajan, and Anchal Manchanda. "A Brief Study on Retroperitoneal Paraganglioma." Journal of Pharmaceutical Research International, July 31, 2021, 64–66. https://doi.org/10.9734/jpri/2021/v33i39B32184.
30- Pandey, Vidya Bhushan, Renu Bharat Rathi, Bharat Rathi, and Jitesh Verma. "Evaluation of Comparative Efficacy of Brahmi vs. Haritaki Extract in the Management of Academic Stress in Adolescent Students- A Prakriti Based Double-Blind Randomized Controlled Trial." Journal of Pharmaceutical Research International, November 6, 2021, 159–69. https://doi.org/10.9734/jpri/2021/v33i48A33233.
31- Pandya, Naman Kirit, and Utsav Umang Bhatt. "Inflammatory Myofibroblastic Tumor of Hard Palate: A Lesion of Extreme Rarity." Pan African Medical Journal 38 (2021). https://doi.org/10.11604/pamj.2021.38.267.28236.
32- Pandya, Naman Kirit, and Anendd Arroon Jadhav. "Descending Necrotising Fasciitis of Head and Neck Secondary to Insect Bite: Report of a Rare Case." Pan African Medical Journal 38 (2021). https://doi.org/10.11604/pamj.2021.38.271.28594.
33- Parate, Ashutosh, Vasant Gawande, Suvarn Gupta, Ankit Jaiwal, Ashwin Chavan, and Kunal Saoji. "A Comparative Study of Functional Outcome of Olecranon Fractures Managed with Tension

Band Wiring Using K Wires with Tension Band Wiring Using Cancellous Screws Fixation." Journal of Pharmaceutical Research International, July 15, 2021, 193–98. https://doi.org/10.9734/jpri/2021/v33i37A31996.