

Organophosphate (OP) Poisoning a Common Cause of Self-Harm: A Case Report

Buchi Reddy¹, Maneesha Erraboina², Prathyusha Rani Thunla², Banothu Vishnu Priya², Beemarthi Navya² and Suresh Bandari^{3*}

¹Rohini Super specialty Hospital, Hanamkonda, Warangal, Telangana, India

²Department of Pharmacy Practice, Rohini Super specialty Hospital and St. Peter's Institute of Pharmaceutical Sciences, Hanamkonda, Warangal, Telangana, India

³St. Peter's Institute of Pharmaceutical Sciences, Hanamkonda, Warangal, Telangana, India

Article Information

Received date: Jun 15, 2016

Accepted date: Aug 15, 2016

Published date: Aug 22, 2016

*Corresponding author

Suresh Bandari, St. Peter's Institute of Pharmaceutical Sciences, Hanamkonda, Warangal, Telangana, India, Tel: +91 8702567303; Fax: +91 8702567304; Email: reachbandari@gmail.com

Distributed under Creative Commons CC-BY 4.0

Keywords Organophosphate poisoning; Deliberate self-harm; Patient illness; Atropine infusion; Mortality; Patient care

Abstract

Now-a-days Organophosphate (OP) poisoning is a most common socio-medical issue in the evolving world. In 2012 suicide accounted for 1.4% of all deaths worldwide, making it the 15th leading cause of death. The Deliberate Self-Harm (DSH) tendency is the major reason for organophosphate poisoning. Organophosphate poisoning results from exposure to organophosphates (OPs) which extensively used as pesticides for agriculture in India. A case of OP poisoning was admitted in hospital and was treated with Atropine infusion for 10 days and Pralidoxime 9 days, after therapy for 12 days patient was survived. Based on patient illness, appropriate medication was given, patient signs and symptoms were reduced, and vital signs were controlled and discharged with good health.

Introduction

A poison is a substance that may produce death, serious illness, or harmful effects when introduced into the body in a relatively small quantity. Organophosphate (OP) compounds are a diverse group of chemicals used in both domestic and industrial settings [1]. Organophosphate poisoning occurs due to Organophosphates (OPs) exposure in the body. These OPs cause the inhibition of Acetylcholinesterase (AChE), leading to the accumulation of Acetylcholine (ACh) [2,3]. As per previous reports worldwide mortality rate in OP poisoning ranges from 3% to 25% [4]. The main pharmacological management of OP poisoning is atropine (Anticholinergic agents) infusion and non-pharmacological management is psychological counseling for better patient care [5]. The primary step in treatment for OP poisoning is decontamination (removing cloths and gently cleanse patients suspected of OP exposure with soap and water) and airway control and oxygen supply. Other medications include Pralidoxime (2-PAM), and benzodiazepines (eg, diazepam). If the patient had ocular exposure isotonic sodium chloride solution or lactated Ringer's solution are used [6]. Poisoning among all age groups and both genders is seen everywhere and the incidence of poisoning with reference to insecticides, pesticides and rodenticides has become more common than others in the modern times because of their easy availability, low cost, efficacy of action and rapid death. Suicidal behavior often occurs as a response to personal psychological stress in a social context where sources of support are lacking and may reflect a wider absence of well-being and cohesion. According to WHO (World Health Organization), 803,900 suicide deaths and suicide accounted for 1.4% of all deaths, making it the 15th leading cause of death worldwide in 2012 [7]. The incidence of poisoning in India is uncertain due to lack of data and poor documentation. It has been estimated that about 5 to 6 persons per lakh of population die due to poisoning every year [8]. Deliberate Self-Harm (DSH) is a major problem in the developing world, responsible for around 880,000 deaths in 2010 [9]. The toxicity of available poisons and paucity of medical services ensures that mortality from self-poisoning is far greater in the tropics than in the industrialized world [10].

Case Report

A 35 year old male patient alleged for Chlorpyrifos liquid (crystalline organophosphate insecticide) 100ml at 12.00 PM at his home, was taken to a government hospital for stomach wash, and then he was presented to the emergency department at the Rohini super speciality Hospital, Warangal, with chief complaints of irrelevant talk, irritable, restless. Present history declares that patient was depressed about a massive loss in his business for a month. His social history reveals that he is non-alcoholic and non-smoker. On examination, he was conscious and coherent, well built, irritable, irrelevant speech, restless and a diagnosis was made to be OP poisoning induced psychosis. His hematological report, electrolytes, liver function tests, random blood sugar levels, blood urea, serum creatinine, urine analysis was found to be normal. His arterial blood gas analysis

Table 1: The day wise observations and treatment pattern.

Day	Observations	Therapy
1	O/E patient was drowsy, not reacting to physician's comments and irritable Temperature - 100°F, BP - 130/90 mmHg, PR - 123 bpm, RR - 26 per min and pupils were mid dilation was observed by paramedical staff (Right – 4mm diameter and Left – 3mm diameter), reacting light	Atropine infusion 50ml (2ml/hr) IV, Pralidoxime 500mg TID IV, Cefoperazone sodium 1gm BD IV, Pantoprazole 40mg OD IV, Haloperidol 5mg/ml STAT IM Midazolam 5mg/ml STAT IV Paracetamol 100ml STAT IV
2	O/E patient was conscious, but not reacting to comments Temperature - 101°F, BP - 130/90 mmHg, PR - 104 bpm	Continue Same Treatment (CST) Atropine infusion 1ml/hr IV Promethazine 25mg/ml BD IM
3	O/E patient was conscious and reacting to comments Temperature - 99°F, BP - 130/90 mmHg, PR - 120 bpm	CST Paracetamol 650mg TID PO Atropine infusion 2ml/hr IV
4	O/E patient was conscious and coherent Cholinesterase/pseudo cholinesterase estimation - < 1 K U/L (Normal Range: 4.62 to 11.50 K U/L)	CST Atropine infusion 2ml/hr IV Haloperidol, Promethazine was switched to SOS (if needed)
5	O/E patient was conscious Fasciculation's (+)	Atropine infusion 4ml/hr IV
6	O/E patient was conscious and better Fasciculation's (++)	Atropine infusion 5ml/hr IV
7	O/E patient was better Fasciculation's (+)	Atropine infusion 4ml/hr IV
8	O/E patient recovered Fasciculation's were decreased	Dose tapering of atropine infusion was done (3ml/hr – 2ml/hr – 1ml/hr)
9	O/E patient recovered and obeying comments No Fasciculation's	Atropine infusion was stopped Inj Atropine 1mg 2 nd hourly
10	O/E patient was stable and normal behavior Normal physical signs	Inj Atropine 1mg 8 th hourly.

BD: Twice Daily, CST: Continue Same Treatment, IV: Intravenously, IM: Intramuscularly, OD: Once Daily, PO: Per Orally, SOS: If needed, STAT: Immediately, TID: Thrice Daily.

shows that the pH (7.5), partial pressure of oxygen (PO₂) - 141.8 mmHg were elevated and partial pressure of carbon dioxide (PCO₂) - 22.6 mmHg, bicarbonate (HCO₃) - 19.0 mmol/L were declined. The treatment included Atropine infusion (Anticholinergic agent) 50ml (2ml/hr) given intravenously (IV), Pralidoxime (Antidote) 500mg TID IV, Cefoperazone sodium (Antibiotic) 1gm BD IV, Pantoprazole (Proton pump inhibitor) 40mg OD IV given prophylactic for ulcers, Vitamin B1, Vitamin B6 and Vitamin B12 (multivitamin) OD given Intramuscularly (IM), IV fluids include 5% dextrose 500 ml, 25% dextrose 100ml, dextrose normal saline 500ml, ringers lactate 500ml and Haloperidol (Antipsychotic) 5mg/ml IM, Midazolam (Antianxiety) 5mg/ml IV, Paracetamol (Antipyretic) 100ml IV was given STAT (immediately) on day of admission. The physician advised for cholinesterase/ pseudo cholinesterase estimation on 2nd day (Table 1).

Atropine injection was stopped on the 11th day, patient was stable, better, conscious, talking normally, no fasciculation were observed and physician advised for discharge on the 12th day.

The medication prescribed on discharge was Pantoprazole tablet (Proton pump inhibitor) 40mg OD, multivitamin tablet OD, calcium tablet OD and patient was counseled about lifestyle changes that includes not to be re-exposed to organophosphates (for at least a few weeks), perform yoga to relax, relieve stress and patient representatives were advised to support the patient.

Conclusion

Poisoning remains an important method of Deliberated Self-Harm (DSH) and carries a significant impact on morbidity and mortality. In the above case, patient had severe complications for intake of poison even though all lab reports were normal, patient was not responding

properly and in very irritable state. He was also diagnosed with psychosis; suitable therapy was given to decrease psychosis signs. After 12 days of incessant therapy, patient improved, all vital signs were normal and discharged. A proper supportive therapy was given to patient and well counseled to avoid further complications. In general, awareness and education about the potential toxicity of commonly used pesticides may help in reducing the burden of poisoning. The establishment of the Poison Information Centre (PIC) with appropriate information and by conducting awareness programs may have impact to reduce the pesticide poisoning. However pesticide poisoning has become the most common method of DSH and thus reflecting a positive association between impulsive suicidal behavior and easy availability of pesticides in the region. In our study, the patient agonized due to work stress. This study emphasized about psychosocial management through community based mental health program may help to reduce morbidity and mortality.

References

1. Abubakar S, Githa K, Kiran N. A Study on Pattern of Poisoning Cases in a Tertiary Care Hospital, Bangalore. Indian Journal of Pharmacy Practice. 2014; 7: 13-17.
2. Pandit V, Seshadri S, Rao SN, Samarasinghe C, Kumar A, Valsalan R. A case of organophosphate poisoning presenting with seizure and unavailable history of parenteral suicide attempt. J Emerg Trauma Shock. 2011; 4: 132-134.
3. Yurumez Y, Durukan P, Yavuz Y, Ikizceli I, Avsarogullari L, Ozkan S, et al. Acute organophosphate poisoning in university hospital emergency room patients. Intern Med. 2007; 46: 965-969.
4. Abdel Rasoul GM, Abou Salem ME, Mechaal AA, Hendy OM, Rohlman DS, Ismail AA. Effects of occupational pesticide exposure on children applying pesticides. Neurotoxicology. 2008; 29: 833-838.

5. Bhattarai MD, Singh DL, Chalise BS, Koirala P. A case report and overview of organophosphate (OP) poisoning. Kathmandu Univ Med J (KUMJ). 2006; 4: 100-104.
6. Katz KD. Organophosphate Toxicity Treatment & Management. Department of Emergency Medicine 2016.
7. World Health Organization (WHO). Preventing suicide: A global imperative. Geneva, Switzerland. Nonserial Publications. 2014.
8. Gupta SK, Kumar S, Sheikh MI. Study of organophosphorus poisoning in Surat, India. Journal of Indian Academy of Forensic Medicine. 2006; 28: 83-87.
9. Lozano R, Naghavi M, Foreman K, Lim S, Shibuya K, Aboyans V, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. Lancet. 2012; 380: 2095-2128.
10. Eddleston M. Patterns and problems of deliberate self-poisoning in the developing world. QJM. 2000; 93: 715-731.