

Original Article

Intermediate Syndrome in Organo Phosphorous Poisoning Patients admitted to ICU-A Retrospective Analysis

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Abstract

Background: Poisoning with Organophosphorus (OP) compounds is one of the most common presentations we come across in critical care units. Recognition and initiation of immediate treatment holds key to the outcome. **Aims:** To study the outcome of OP compound poisoning patients, the effect of delay and the frequency of Intermediate syndrome. The case sheets of patients admitted with OP compound poisoning to ICU in medical college referral hospital were retrospectively analysed. **Materials and methods:** We have done retrospective analysis of 177 patients admitted to the emergency department with history of acute OP poisoning. Eight patients were brought dead, 10 patients were referred and 159 patients were admitted to ICU. **Statistical analysis:** Student t- test is used to find the significance of study parameters on continuous scale between two groups on metric parameters. Chi-square/ Fisher Exact test is used to find the significance of study parameters on categorical scale between two or more groups. **Results:** We found that Intermediate syndrome is commonly seen when there is delay of more than 9 hours for hospitalization following OP compound consumption and delay in starting atropine and PAM. **Conclusion:** OP composed insecticide poisoning is a life threatening condition that needs rapid diagnosis and treatment with good supportive care, starting of early enteral feeds, monitoring for the prevention and management of acute and delayed complications that occur during the course of stay in ICU.

Key words: Intermediate syndrome, OP poisoning, ICU, Retrospective analysis.

Introduction

Organophosphorous poisoning (OP) is a common and a serious occupational hazard of agriculturists and accounts for more than 80% of pesticide-related hospitalization. Administration of atropine and oxime reactivators is the mainstay in management of OP poisoning. More severe poisoning may require management in ICU and mechanical ventilation. Important factors influencing mortality includes the amount of poisoning, time gap for initiation of treatment, respiratory support and weaning

from ventilator. Mortality due to OP compound poisoning is due to respiratory failure or cardiovascular collapse in the early period whereas intermediate syndrome, peripheral respiratory failure, aspiration pneumonia and complications of ventilation are the causes in the later period. This study was undertaken to find the clinical outcomes in OP compound poisoning, and the frequency of intermediate syndrome.

Materials and methods

The case sheets of patients admitted for OP compound poisoning to a rural based medical college hospital at Kolar, Karnataka from January 2013 to December 2014 was screened. The case files of patients treated at ICU were selected for the study. Ethical clearance to retrospectively analyse the case records of pa-

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Received 5th Apr 2016, Accepted 20th June 2016

tients admitted for OP poisoning in the referral hospital was obtained from the institutional ethical committee. The following information obtained from the case sheets were entered into a structured performa - time to start atropine and oximes from the time of poisoning, ventilator support, extubation time, presence of intermediate syndrome and deaths. Patients were categorized into mild, moderate and severe poisoning based on Dreisbach scores

Statistical analysis

Data was entered into MS excel sheet. The frequency of Dreisbach scores and intermediate syndrome is calculated for both sex. The occurrence of intermediate syndrome according to the time gap between poisoning and administration of atropine is found. P value of <0.05 is considered statistically significant.

Results

In the study period 159 patients with OP compound poisoning were treated at the ICU. The characteristics of the OP compound poisoning patients admitted to ICU are presented in table 1. Out of 159 patients 18 (11.3%) died. Among these 18 patients 16 had moderate OP toxicity.

Table 1. Characteristics and outcomes of patients with OP poisoning

Characteristics	No.	(%)
Sex (n%)		
Male	99	62
Female	60	38
Age		
Range (17-92 yrs)		
17-30 yrs	102	64
>30 yrs	57	36
Mortality		
Male	14	8.8
Female	04	2.5
Total	18	11.3
Intermediate Syndrome		
Male	10	6.3
Female	12	7.5
Total	22	13.8

The severity of poisoning was graded according to Dreisbach's classification where mild grade has symptoms of nausea, vomiting, diarrhoea and sweating; moderate grade has lacrimation, salivation, miosis and fasciculation; and severe grade has incontinence, apnoeic spells, ARDS, areflexia, seizures and coma.^[12] Accordingly, out of 159 patients, 109 (68.6%) had mild, 37 (23.3%) had moderate and 13 (8.2%) had severe grade of poisoning. Out of 109 patients with mild poisoning, 10 had intermediate syndrome, whereas 9 patients with moderate poisoning and 3 patients with severe poisoning had intermediate syndrome (Table 2).

Table 2. Dreisbach score in sample of studied patients with OP poisoning

Dreisbach Score	Female No.(%)	Male No.(%)	Total
Mild	44 (73.3)	65 (65.7)	109(68.5)
Moderate	13 (21.7)	24 (24.2)	37(23.3)
Severe	03 (5.0)	10(10.1)	13(8.2)
Total	60	99	159

Table 3 shows that all the 75 (47.2%) patients admitted to the hospital and treated with atropine/PAM/stomach wash within 5 hours (lag time) of OP compound consumption survived and did not develop intermediate syndrome.

Discussion

The retrospective analysis of 159 cases of OP compound poisoning found that adolescents and young adults were the commonest victims. Intermediate syndrome was observed in 13.8% and mortality in 11.3% of the patients. Studies on hospitalized patients due to OP compound poisoning have reported males commonly being affected compared to females and also more commonly in young adults.^[6,7] The mean time from poisoning to oxime administration was 5.49 hours and is similarly seen in analysis of OP compound poisoning cases in other centres.^[8]

Intermediate syndrome is a state of muscle paralysis that occurs after recovery from cholinergic crisis but before the expected

Table 3. Variables in relation to intermediate syndrome

Variables	Intermediate syndrome		Total (mean ±SD)	P value
	No (mean ± SD)	Yes (mean ± SD)		
Time taken for hospital admission after consumption of OP Compound in hours	4.9 ± 4.4	9.0 ± 12.8	5.4 ± 6.4	0.005**
Time to start of atropine and oximes (hrs)	5.4 ± 2.6	10.1 ± 14.3	6.0 ± 6.0	0.001**
Time of start of mechanical ventilation (hrs)	7.2 ± 11.1	11.4 ± 16.0	7.8 ± 11.9	0.127

** Statistically highly significant

onset of the delayed polyneuropathy, and probably results from post-synaptic neuromuscular junction dysfunction.^[9] The incidence of intermediate syndrome in our study was 13.8%. Reported frequency of intermediate syndrome varies from 8% to 49%.^[10,11] OP compound poisoning accounts for more than 80% of pesticide related hospitalization. It is of great concern since it affects the working age group of the society. Mortality is directly proportionate to the severity of poisoning. Intermediate syndrome is commonly seen when there is delay of more than 9 hours for hospitalization following OP compound consumption and a delay in starting of atropine and PAM.

Conclusion

No single factor is independently responsible for mortality in OP poisoning patients. OP insecticide poisoning is a life threatening condition that needs rapid diagnosis and immediate treatment. Emphasis must also be given to good supportive care and starting of early enteral feeds and monitoring for the prevention and management of acute and delayed complications that occur during the course of stay in ICU.

References

- Ahmed SM, Das B, Nadeem A, Samal RK. Survival pattern in patients with acute organophosphate poisoning on mechanical ventilation: A retrospective intensive care unit-based study in a tertiary care teaching hospital. *IJA* 2014; 58: 11-17.
- Eddleston M, Szinicz L, Eyer P, Buckley N. Oximes in acute organophosphate pesticide poisoning: a systematic review of clinical trials. *QJM*. 2002 ; 95(5): 275–83.
- Gündüz E, Dursun R, Icer M, Zengin Y, Güllü MN, Durgun HM, Gokalp O. *Fac J Pak. Med Assoc.* 2015; 65(9): 967-72.
- Kiran BR, Vishwas GK, Dheeraj R Patel, Chirag Babu PS. Organophosphorus poisoning cases requiring mechanical ventilation: A retrospective study at a tertiary hospital. *IJAR* 2014; 4: 435-37.
- Chaudhary S, Singh K, Sawlani K, Jain N, Vaish A, Atam V et al. Prognostic significance of estimation of pseudocholinesterase activity and role of pralidoxime therapy in organophosphorous poisoning. *Toxicol Int* 2013; 20: 214-17.
- Srinivas R, Venkateswarlu V, Surender T, Eddleston M, Nick AB. Pesticide poisoning in south India: Opportunities for prevention and improved medical management. *Trop Med Inter Health* 2005; 10: 581-88.
- Karalliedde L, Senanayake N. Acute organophosphorous poisoning in Sri Lanka. *Forensic Sci Int* 1988; 36: 97-100.
- Shaikh J M, Siddiqui F Gand Soomro A G. Management of acute organophosphorus insecticide poisoning: an experience at a university hospital. *JLUMHS* 2008;97-101.
- Karalliedde L, Senanayake N: Organophosphorus insecticide poisoning. *Br J Anaesth* 1989; 63: 736-50.
- Samuel J, Thomas K, Jeyaseelan L, Peter JV, Cherian AM. Incidence of intermediate synd in organophosphorus poisoning. *Assoc Physicians India.*1995; 43: 321-23.
- He F, Xu H, Qin F, Xu L, Huang J, He X. Intermediate myasthenia syndrome following acute organophosphate poisoning-an analysis of 21 cases. *Hum Exp Toxicol.* 1998; 17:40-45.
- Dreisbach RH. Cholinesterase inhibitor pesticides. *Handbook of poisoning*, 11th ed. California: Lange Medical Publications; 1983. p. 106-14.