CLINICAL PROFILE AND IMPACT OF PROPER TREATMENT IN ACUTE ORGANOPHOSPHORUS PESTICIDE POISONING

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ABSTRACT

Background: Acute poisoning with organophosphorus (OP) pesticides is one of the most common forms of poisoning world wide. It generally results from accidental or intentional ingestion, inhalation or cutaneous exposure. **Objective**: To determine the demographic & clinical features, management and outcome of patients with acute organophosphorus poisoning. **Patients and Methods**: This observational study was conducted in medical department of Sheikh Zayed Medical College/Hospital, Rahim Yar Khan from 1st April to 30th September, 2009. Fifty patients above 12 years of age, who presented with acute organophosphorus poisoning, were included in this study. Demographic features, mode and route of poisoning, clinical presentations, management, and outcome were noted. **Results**: Mean age of 50 patients was 24 ± 6.17 years. Thirty nine (78%) patients were male and 11 (22%) were female. Accidental exposure was present in 13 (26%) patients and suicidal attempt in 37 (74%) patients. Forty eight (96%) patients took OP orally and 2 (4%) were exposed to it through inhalation. Mean time from exposure to presentation in emergency department was 1.68 hours and mean hospital stay was 2.52 days. Three patients with OP poisoning died. **Conclusion**: OP poisoning is usually suicidal and more common in young males. Prompt treatment ensures low mortality rate.

Key words: Organophosphorus poisoning, accidental exposure, suicidal attempt

INTRODUCTION

Organophosphorus (OP) poisoning is one of the major health problems world-wide.[1] These compounds have been used as insecticides for the past 50 years.[2,3] Worldwide, an estimated 3 million people are exposed to organophosphates each year, with up to 300,000 fatalities.[4,5] Poisoning generally results from accidental or intentional ingestion and inhalation of, or cutaneous exposure to, agricultural pesticides.[4,6] It is characterized by the clinical picture of acute cholinergic crisis through the inhibition of acetylcholinesterase which leads to an overabundance of acetylcholine in the synapse.[7,8,9]

The clinical features of acute OP poisoning include bradycardia, miosis, lacrimation, salivation, bronchorrhea, bronchospasm, urination, emesis and diarrhea. The nicotinic effects include fasciculations, muscle weakness and paralysis. Cardiac arrhythmias, including heart block and QTc prolongation, are occasionally observed in OP poisoning.[10]

Early resuscitation with atropine, oxygen, respiratory support and fluids is needed to improve outcome. Atropine dosing should be titrated to the therapeutic end point of the clearing of respiratory secretions and the cessation of bronchoconstriction.[11] The role of oximes is not completely clear. Similarly, there is no high quality evidence to support the clinical effectiveness of gastric lavage or urinary alkalinization. [11, 12] Case fatality rates for intentional self poisoning is 10 to 20%.[9] Current study was conducted to determine the demographic and clinical features, management and outcome of patients with acute organophosphorus poisoning.

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PATIENTS AND METHODS

This was an observational study conducted in Medical department of Sheikh Zayed Medical College/Hospital, Rahim Yar Khan, from 1st April to 30th September, 2009. Fifty patients older than 12 years, who were admitted with acute OP pesticide poisoning, were included in this study. The diagnosis of OP poisoning was made on the basis of history of exposure, either oral or inhalational, and clinical features, including lacrimation, excessive salivation, vomiting, diarrhea, bradycardia, miosis, respiratory distress, crepitations on chest examination and muscular weakness.

Data was collected on proforma containing information of demographic features (age, sex), route of poisoning (oral, inhalational), mode of poisoning (accidental, suicidal, homicidal), clinical presentation, management (atropine, pralidoxime), duration of hospital stay and outcome (death, discharge).

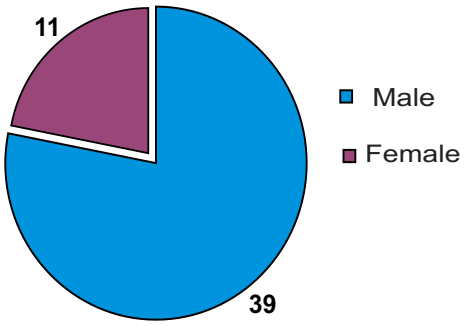
Data was analysed by using SPSS 16.0 software. Quantitative data was recorded in mean ± standard

deviation, and compared using student's t-test. Qualitative data was recorded as percentage and compared using chi-square test.

RESULTS

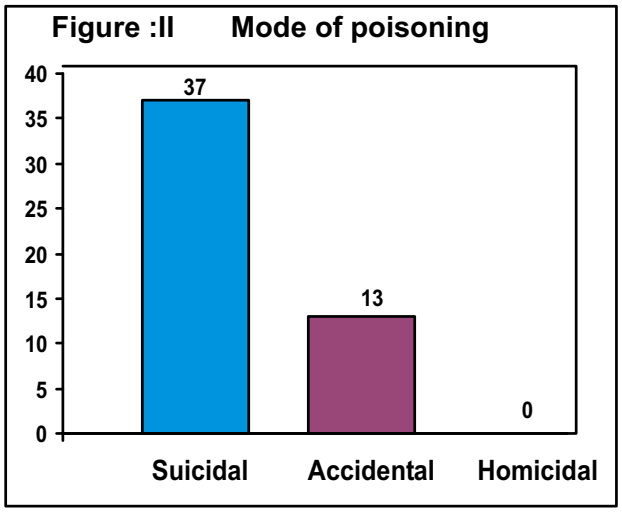
A total of 50 patients were included in the study, age ranged from 12 to 32 years. Thirty six percent patients were in 12-24 years age group and 64 % were in 25-32 years age group. Seventy eight percent were male and 22 % female (Figure I). Profile of these patients is given in table I.

Figure: I Sex distribution



At presentation, 96 % patients had miosis, 92 % had bradycardia, 48 % had excessive salivation and only 8 % had diarrhea, while respiratory distress was present in 36 %. Atropine was given to every patient. It was started at a dose of 1 mg every 5 minutes and then tailored according to the clinical response. Pralidoxime could not be given to every patient due to the problems of availability and cost. Sixteen (32 %) patients were given pralidoxime, none of whom died. Where given, dose was 2 g intravenously over half an hour and then 0.2 g hourly till the patient responded clinically.

Figure :II Mode of poisoning



Hospital stay was one day in 8 patients, 2 days in 24, 3 days in 6, 4 days in 8 and more than 4 days in 4 patients.

Suicidal attempt was more common in 12-24 years age group and the difference reached statistical significance (p = 0.018). Regarding mode and route of poisoning (Figure II) and time to presentation in A & E, there was no statistical significant difference between male and female (p = 0.704, 0.534, 0.733 respectively).

Table I:

Profile of patients presenting with acute OP poisoning

Age in years (mean ± SD)		24 ± 6.17
Gender	Male	39
	Female	11
Mode of poisoning	Suicidal	37
	Accidental	13
	Homicidal	0
Route of poisoning	Oral	48
	Inhalation	2
Hospital stay in days (mean ± SD)		2.52 ± 1.18
Mortality		3

DISCUSSION

Organophosphorus pesticides, are regularly used by farmers for protecting the crops and cause toxicity through inhalation or direct contact, if protective measures are not used. Farmers keep these pesticides at their homes, so there are incidences of accidental oral ingestion or oral intake for suicidal purpose. Organophosphorus toxicity accounts for about 3 % admissions in medical units of our hospital.

Mean age of our patients was 24 ± 6.17 years and is similar to that seen in other studies in southern Pakistan.[13,14] In our study, 64 % patients were between 25 to 32 years of age; on the other hand in a nearby town (Pano Aqil), 79 % patients were between 16 to 25 years of age.[13] Male patients were more common in our study (78 %) than female. It is favored by similar figures (75 %, 60 %, 53 %) in other studies.[14,15]

There is a risk of poisoning through inhalation or direct contact during spray of OP pesticides, but the most common route of poisoning is oral ingestion.[14] This is due to the fact that most common mode of poisoning is suicidal attempt.[13,14] Suicidal tendencies are more in younger age group.[15] Our study revealed

the same observations but, contrary to another study,[15] suicidal mode of poisoning was equal among male and female patients. Mortality rate was low in our study (6 %) as compared to other studies (12 %, 9 %, 8 %).[13,14,16] This might be due to prompt use of pralidoxime, which had been found effective in reducing mortality, as there was no death in patients receiving pralidoxime.[17]

CONCLUSION

Organophosphorus pesticide is the toxin which is used mainly orally by young male for suicidal purpose. Prompt treatment, especially the use of pralidoxime may reduce mortality.

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" It's fine to celebrate success but it is more important to heed the lessons of failure."

Bill Gates