Original Article

Clinical Pattern and Outcome of Organophosphorus Poisoning

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ABSTRACT

OBJECTIVES: To determine the clinical presentation and outcome of acute organophosphorus poisoning.

METHODS: This case series included 100 cases from various medical wards of Civil Hospital Karachi from February 2008 to December 2008. We included all patients of organophosphorus poisoning who showed either signs of muscarinic or nicotinic involvement. However we excluded those patients in which organophosphorus poisoning was doubtful and who were intoxicated with poisoning other than organophosphates.

RESULTS: Hundred patients of organophosphate poisoning were admitted among these 68% were males and 32% were females. Modes of poisoning were suicidal in 65% of cases, accidental in 27% and 8% were homicidal. Though the clinical presentation of acute poisoning was variable however the most consistent feature was miosis (98%). According to W.H.O. classification for severity of organophosphorus poisoning; 60% cases were moderate, 28% were severe and 12% were mild. The mortality rate was 20% and mostly among patients who presented with severe symptoms and presented late.

CONCLUSION: Pesticides are the major chemical agents which pose a health threat particularly to young people, depressed individual and farm worker so this fetal condition needs rapid diagnosis and early treatment.

KEY WORDS: Organophosphorus; organophosphate; poisoning, suicidal, accidental, homicidal.

INTRODUCTION

Organophosphate insecticides/pesticides are used widely through out the world.[1] Organophosphates from occupational, accidental and intentional exposures are a global health problem especially in developing countries.

According to WHO two million people attempt suicide and one million accidental poisoning cases occur each year worldwide.[2,3] Organophosphates are the most common mode of poisoning in Asia, being both wide spread and resulting in high mortality rate [1,4]. In several areas, some pesticides have become the trendiest method of suicide, gaining unsavory reputation among health care personnel and community[4].They are chemical agents used widely throughout the world, especially in agriculture, in glaucoma as a therapeutic agent and also a nerve agent in war fares.[7] The exact prevalence of organophosphate poisoning is unknown in Pakistan as many cases are unnotified due to religious, social or cultural reasons. However reported incidence of deliberate self poisoning (DSP) in Pakistan is about 8 per 100,000 in men and women. Benzodiazepines and organophosphate compounds are commonly used for DSP. [5, 6]

The mode of exposure to organophosphates varies including dermal, gastrointestinal and inhalational routes.[8-10]

The clinical signs regarding organophosphorus toxicity are muscle weakness, muscle fasciculation, cramps, twitching and even sometimes the patient may need ventilatory support due to weakness of respiratory muscles. (acute cholinergic crisis) [11,12,13].

Intermediate syndrome which usually starts 24 - 46 hours after acute syndrome; characterized by respiratory paresis, weakness, depressed tendon reflexes and transient extra pyramidal syndrome, cranial nerve palsies, muscle weakness; may last up to 18 days.

Organophosphorus induced delayed neuropathy (COPIND), which is a symmetric distal neuropathy usually, occurs after weeks of exposure.[15]

The organophosphorus poisoning is a very serious condition that needs rapid treatment. Emergent and appropriate management is always desirable to prevent the serious complications and high mortality.

In this study we determine the clinical presentation and outcome of organophosphorus poisoning.

METHODOLOGY

This is case series of 100 consecutive patients conducted in various medical wards of Civil Hospital Karachi from February 2008 to August 2008. We included all patients of organophosphate poisoning presented either with signs of muscarinic involvement, or signs of nicotinic involvement; cases presented with combined

signs of both muscarinic and nicotinic involvement were also included. However, we excluded those patients in whom organophosphorus poisoning was doubtful and patients who were intoxicated with organophosphorus mimickers, for example Nicotine poisoning, opoid poisoning, mushroom poisoning, gastroenteritis or patients who were diagnosed or suspected of having, Myasthenia Gravis, Guillian Barre Syndrome and pontine haemorrhage. Outcome measured according to W.H.O. classification of severity.

WHO Classification for Severity

Severity	Signs/symptoms
Mild	Anorexia, Headache, Dizziness, Weakness, Anxiety, Tremors of the tongue and the eye lids, Miosis, Impairment of vision
Moderate	Nausea, Salivation, Lacrimation, Abdominal Cramp, Vomiting , Sweating , Slow pulse, Muscular tremors
Severe	Diarrhea, Pinpoint pupils and non-reactive pupils, Respiratory difficulty, Pulmonary edema, Cyanosis, Loss of sphincter, control, Convulsions, Heart block, Coma

Data Analysis

After taking informed consent exact mode of poisoning was ascertained and detailed clinical examination was done. Statistical analysis was performed using SPSS version 10. Descriptive statistics (frequency and percentage) were computed for categorical variable like sex, age, group, clinical presentation and outcome.

RESULTS

Hundred patients of organophosphate poisoning were admitted. Average age was 28.6+-9.8 years. The majority of these patients belong to the age group of 16-30 years **(Table I)**. Among these 68% were males and 32% females. Regarding marital status 50% were married and 50% unmarried. Modes of poisoning were suicidal in 65% of cases, accidental in 27% while it was homicidal in 8% of cases.

Various Clinical presentation of acute organophosphate poisoning are presented **(Table II)**. Miosis was the most common clinical feature found in 99% of the patients followed by increased salivation in 85% and cardiac manifestation in 32%. In 69% patients bronchospam and in 60% patients fatigue was seen. 80% of the patients had anxiety and restlessness, 70% patients had lacrimation, 57% were urinating, 68 % were sweating, 20% were having convulsions, 12% had cranial nerve palsies and 12% had muscles weakness.

According to W.H.O. Classification for Severity of Organophosphate poisoning 60% cases were moderate and 28% were severe. Among those with severe grade, 64% patients belonged to the age group of 16-30 years. Before presenting to tertiary care facility, only 6% of all patients received specific emergency treatment at primary health care facility, 52% patients received non-specific emergency treatment, while 42% did not received any treatment. Among those who received specific treatment, 5 patients' recovered and 1 patient expired. Among those who received emergency but non specific treatment 48 patients survived and 4 expired. For those who did not receive any treatment, 15 patients expired and only 27 recovered.

Overall mortality rate was 20%. Out of 20% patients, 9 (45%) were males and 11(55%) were females. According to W.H.O classification for severity, among 28 patients who presented with severe symptoms 10 patients were discharged to home and 18 expired. For those 60 patients with moderate symptoms, 58 sustained the incidence while 2 patients expired **(Table III)**.

TABLE I: FREQUENCY DISTRIBUTION OF AGE

Age Group	Frequency	Percentage
12-15	06	06%
16-30	68	68%
31-45	12	12%
46-50	08	08%
>50	06	06%

TABLE II: CLINICAL FEATURES OF ORGANOPHOSPHORUS POISONING (n=100)

Clinical Features	No.of Patients
Puulse Rate	
45-65	60
66-75	21
>75	19
Miosis	98
Bronchospasm	69
Anixety And Restlessness	80
Cardiac Manifestation	
Qt Interval Normal	68
Qt Interval Prolonged	32
Fatigue	60
Salivation	85
Lacrimation	70
Urination	57
Sweating	68
Fits	20
Muscle Weakness	12
Cranial Palsies	12

TABLE III: OUTCOME OF PATIENTS ACCORDING TO W.H.O CLASSIFICATION (n=100)

W.H.O Grading	Discharged	Expired
Mild	12	0
Moderate	58	2
Severe	10	18

DISCUSSION

Organophosphorus compounds are used globally for pest control over 100 years. These are common agents for suicide and accidental poisoning due to its easy availability [15]. In agricultural countries like Pakistan, toxicity of pesticide as well as lack of medical services is taking its toll in the form of high case fatality rates.

The data derived from the study clearly showed that organophosphorus poisoning was common in males (68 were males and 32 were females). This male predominance in this study is also supported by local as well as by international studies [8,9,15]. This is sharp contrast to the study of Paudyl BP [16] which showed that although the age groups were similar in both studies more females attempted suicides than males.

Suicidal mode of organophosphate poisoning is not only common in Pakistan but also common in others parts of the world. In this study suicidal mode of poising was common followed by accidental and homicidal which were 65%, 27% and 8% respectively. This study's finding is in contrast to one local study done in Bahawalpur by Khan RA et al[21] in which the most common mode of poisoning was accidental (60%) followed by suicidal (35%).

Majority of the cases were young peoples from the age group 16-40 years about 80%, this is comparable to other studies as done by Khan MN et al [25]in which maximum number of patients were between 15-35 years of age. This finding is also supported by study of Vander Hoek et al[18] and Chakerbarti K et al[21.]

Most frequent signs noted in the study were miosis 98%, salivation 85%, anxiety and restlessness 80%, lacrimation 70% and bronchospam 69%. Other frequent clinical features noted in this study are mentioned in table 2 with percentages, also comparable with other studies likes Tahir MH et al [8] and Karki P et al [26].

In this study it also became evident that out of 20 patients who expired, 15 patients received no therapy before coming to the hospital and arrived late, also supported by study done by Suliman MI et al [1]. Mortality rate was 20% similar to study done by Numidasa UA et al [27]. However 5% mortality higher than the study by Pandyal BP [16] was observed in our study which may be due to lack of ICU facilities, late arrival, not receiving any treatment at periphery before arrival to the hospital, poverty and illiteracy.

CONCLUSION

Pesticides are the major chemical agents, which pose a health threat particularly to young people, depressed individuals and farm workers. So this serious condition needs rapid diagnosis, early and effective treatment.

The importance of first aid can not be overlooked because patients who received first aid at the spot did better than those with out first aid and have less complication and severity of poisoning.

These findings demand a swing in emphasis in community education towards hazardous of the poisoning and importance of first aid management to prevent complications and severity.

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