THE OBSERVATIONAL & CROSS-SECTIONAL STUDY OF CLINICAL PATTERN AND OUTCOME OF ORGANOPHOSPHORUS POISONING AT MGM MEDICAL COLLEGE AND HOSPITAL, JAMSHEDPUR, JHARKHAND

Medicine

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ABSTRACT

OBJECTIVES: To study the clinical presentation and outcome of acute organophosphorus (OP) poisoning.

METHODS: This case series included 94 cases from medical wards/emergency/I.C.U. of MGM Medical College, Jamshedpur, Jharkhand from March 2019 to February 2020. All patients of organophosphorus poisoning showing either sign of muscarinic or nicotinic effects were included. We did exclude those patients with doubtful poisoning.

RESULTS: Ninety-Four patients with organophosphate poisoning were admitted. Among these 61% were males and 39% were females. Modes of poisoning were suicidal in 61% of cases, accidental in 35%, and 4% were homicidal. The clinical presentation of acute poisoning was variable however the most consistent feature was miosis (98%). As per WHO classification for severity of organophosphorus poisoning; 57% of cases were moderate, 27% were severe, and 16% were mild. The mortality rate was 17% and mostly among patients who presented with severe symptoms and presented late.

CONCLUSION: OPs are the main chemical threat to young people, depressed individuals, and farmworkers. So rapid diagnosis and early treatment is essential to save

KEYWORDS

Organophosphorus; Organophosphate; Poisoning, Suicidal, Accidental, Homicidal.

INTRODUCTION

Throughout the world, OPs are used widely for insecticides/pesticides. Mostly in our demographic area, persons at height of stress or with depression /bipolar /schizophrenic take organophosphates for committing suicide.

WHO reported two million people to attempt suicide and one million accidental poisoning cases occur each year worldwide.^{2,3}

Organophosphates are the most common method of poisoning in Asia including India. The mortality rate is high.

Despite so common input in the emergency ward the exact prevalence of organophosphate poisoning is unknown in India. It is because most cases are unnotified due to socio-cultural reasons. There is a report that the incidence of deliberate self-poisoning (DSP) in India is about 8 per 100,000 in men and women. Organophosphate and benzodiazepine compounds are commonly used for DSP.

The mode of exposure to organophosphates varies it includes dermal, gastrointestinal, and inhalational routes. The gastrointestinal route is the commonest.

The clinical findings seen in organophosphorus toxicity are muscle weakness, sweating muscle fasciculation, cramps, twitching, defecation, and even respiratory muscles' weakness. (acute cholinergic crisis). The latter may need ventilatory support.

An intermediate syndrome is usually seen 24 - 46 hours after acute syndrome; characterized by respiratory paresis, weakness, depressed tendon reflexes, and transient extrapyramidal syndrome, cranial nerve palsies, and muscle weakness. It usually lasts up to 18 days.

Organophosphorus induced delayed neuropathy (COPIND) is a symmetric distal neuropathy usually, occurs after weeks of exposure. We scrutinized BHTs and did a study on the clinical pattern and outcome of QPs poisoning in this study.

MATERIAL AND METHODS

We studied a case series of 94 consecutive patients conducted in the emergency/ICU of MGM Medical College, Jamshedpur, Jharkhand from August 2019 to June 2020. All patients of organophosphate

poisoning presenting any signs of muscarinic involvement, or nicotinic involvement were included. We excluded doubtful poisoning and persons intoxicated with another poisoning, mushroom poisoning. We ruled out gastro-enteritis or Myasthenia Gravis, Guillain-Barre Syndrome, and pontine hemorrhage by clinical evaluation.

We decided the severity based on a modified WHO classification of severity.

Mild: Tremors of the tongue and the eyelids, **Miosis**, Impairment of vision

Moderate: Sweating, **Slow pulse**, Muscular tremors abdominal pain.

Severe: Respiratory difficulty, Pulmonary edema, Cyanosis, **Loss Of Sphincter Control**, Convulsions, Heart block, **Coma**.

Data Analysis

We scrutinized the BHT and explore the data provided in it. Statistical analysis was performed using Microsoft Excel. Frequency and percentage statistics were computed for variables like sex, age, group, clinical presentation, and outcome.

RESULTS

Ninety-Four patients with organophosphate poisoning were admitted. The average age was 27.8±9.2 years. The major bulk of these patients belong to the age group of 16-30 years (Table I). Among these 61% were males and 39% females. Regarding marital status 40% were married and 60% unmarried. Modes of poisoning were suicidal in 61% of cases, accidental in 35% while was homicidal in 4% of cases.

Table 1 Frequency Distribution Of Age

Age Group in Years	No. of Patients	Percentage
<16	5	5%
16-30	62	66%
31-45	15	16%
46-50	7	7%
>50	5	5%

Table 2 Clinical Features Of Organophosphorus Poisoning (n=94)

Clinical Features	No. of Patients
Pulse Rate	
46-65	62

66-75	19
>75	13
Clinical features	
Miosis	92
Bronchospasm	67
Anxiety and Restlessness	77
Salivation	87
Lacrimation	62
Urination	60
Sweating	69
Fits	22
Muscle Weakness	14

Clinical features of acute organophosphate poisoning are presented in Table II. Miosis was found in 98% of the patients closely followed by increased salivation in 93%. In 71% of patients, bronchospasm was seen. 82% of the patients had anxiety and restlessness, 66% had lacrimation, 64% were urinating, and 73 % were sweating. 23% were having convulsions, 15% had cranial nerve palsies and 15% had muscle weakness.

As per our modified WHO Classification for Severity of Organophosphate poisoning, 57% were moderate and 27% were severe. Among those with a severe grade, 67% of patients belonged to the age group of 16-30.

Before presenting to our hospital, only 7% of patients received specific emergency treatment at the primary health care facility, 54% received non-specific emergency treatment, while 38% did not receive any treatment. Among those who received specific treatment, 5 patients' recovered and 1 patient expired. Among those who received emergency but nonspecific treatment 48 patients survived and 3 expired. For those who did not receive any treatment, 12 patients expired and only 24 recovered.

The overall mortality rate was 17%. Of these patients, 9 (56%) were males, and 7(44%), females.

As per our modified WHO classification for severity, out of 25 severely affected persons 12 were discharged to home and 13 unfortunately died. The moderate group contained 54 patients, 51 survive the death threat while 3 patients died. (Table III).

Table 3 Outcome Of Patients According To Modified WHO Classification (n=94)

Grading	Discharged	Expired
Mild miosis	1 5	0
Moderate + bradycardia sweating	5 1	3
Severe + anyone/ combination of.... loss sphincter control coma, respiratory difficult Pulmonary edema	1 2	13

DISCUSSION

Ops are used worldwide for pest control for nearly more than 100 years. The human population uses these agents for suicide and gets accidental poisoning due to its easy availability. The toxicity of pesticides and lack of medical services registered high death rates.

Our study clearly showed that organophosphorus poisoning was common in males (57 were males and 37 were females). Virupakshappa et al, 2016 reported male dominance. Most of the other studies almost showed male dominance. This is a sharp contrast to the study done by Paudyal BP who showed that more females attempted suicides than males.

The method of organophosphate suicidal poisoning is common in India and commonly seen in other parts of the world, too. In this study suicidal, accidental and homicidal poisoning were 61%, 35%, and 4% respectively. Almost the same findings are endorsed. Virupakshappa et al. However, Lokhande RA et al from Mumbai showed accidental (60%) followed by suicidal (35%). This is in contrast to our study.

Young peoples from the age group 16-45 years share 4/5th cases. It is about 82% and is comparable to other studies by Khan MN et al, Virupakshappa et al, Vander Hoek et al and Chakerbarti K et al

Miosis was present at 98% in this study, salivation at 93%, anxiety and restlessness at 82%, lacrimation at 66%, and bronchospasm at 71%. Table 2 also showed other clinical features with percentages. These findings are also comparable with other studies like Tahir MH et al, Karki P et al and. Virupakshappa et al.

Our study showed that out of 16 patients who expired in the hospital, 15 patients did not receive any effective therapy at the spot or nearest health centers before proceeding to our hospital. Few of them arrived, too, late to be saved. This finding is also reinforced by the study of Suliman MI et al. They showed a mortality rate of 20%. It is similar to the study done by Numidasa UA et al. and Virupakshappa et al. It is all due to late arrival, getting no proper first treatment at periphery before proceeding to the hospital, poverty, and illiteracy.

CONCLUSION

Pesticides/insecticides pose a health threat particularly to young people, depressed and psychotic individuals, and farmworkers. First aid can not be overlooked, because patients who got first aid/treatment in-home or nearest health centers fare better than those without first aid/treatment. They have less complication and severity of poisoning. This is the most primary treatment.

These findings stress the importance of community education towards the dangers of the poisoning and the importance of first aid/treatment to avert complications and severity and lastly death.

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