

Original Research Paper

To Evaluate The Clinical Profile Of Organophosphorus Poisoning In A Tertiary Care Hospital: A Retrospective Study

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Abstract:

Introduction: Organophosphorus compounds are associated with significant morbidity and mortality in developing countries, predominantly affecting the working age group (21-30 years). Organophosphate Compounds (OP) cause most self-poisoning deaths in India due to their easy availability and lack of stringent laws.

Objectives: To know the clinical presentation of OP poisoning cases admitted in tertiary care hospital.

Methodology: A retrospective record based observational study was conducted at tertiary care hospital. All patients admitted were included in study. The data collected from medical record department. Information of age, sex, clinical features, investigation and outcome of the patients were recorded in pre-structured proforma. Total of 90 patients presented at emergency department.

Result: Mean age of the patient presenting in the emergency with clinical features of OP poisoning was 33.3 years (± 10.1) with range from 15 to 70 years. Majority, 55 patients were in the age group of 21-40 years, Symptoms and Signs observed were Nausea and vomiting were most common symptom reported 72.2% of patients. The mean duration of ICU stay was <7 days in 40 (88.88%) out of 45 mild cases,

Conclusion: Most cases are due to suicidal intent due to easy availability. Delay in hospital admission is associated with poor outcomes. Nausea and vomiting was the most common symptom reported by the patients while abnormal pupil size was the most common sign observed at the emergency department. Maximum incidence of poisoning was seen in younger age group less than 30 years of age.

Keywords: Clinical profile, Inhalational, Organophosphorus poisoning, Outcome

INTRODUCTION:

Organophosphate compounds (OPCs) are acetylcholinesterase (AChE) inhibitors used as pesticides with a potential for induction of systemic illness upon toxic exposure^{1,2}. Organophosphorus compounds (OPC) are commonly used as pesticides in agriculture and horticulture. About 200,000 deaths due to pesticide poisoning in the developing world³. The problem is more pronounced in rural Asia. In India, deaths due to OPC poisoning are more common in southern and central India⁴. In Indian studies, the incidence of suicidal poisoning using OPC ranges from 10.3% to 43.8%⁵. The situation is not different in the current COVID- 19 pandemic.

OPC, these compounds enter the human body by ingestion, inhalation or skin absorption, are irreversible inhibitors of choline esterase and pseudocholinesterase (butyrylcholinesterase) enzymes, which cause the breakdown of acetylcholine (neurotransmitter) into choline and acetic acid⁶. Accumulation of Ach activates muscarinic and nicotinic receptors at synapses within the peripheral and central nervous systems producing neurotoxic sequelae with a high mortality rate⁷. The clinical features of OPC poisoning comprise a triphasic response which includes an initial acute cholinergic phase, an intermediate syndrome and nonlethal delayed polyneuropathy associated with morbidity. Symptoms produced due to excessive acetylcholine (Ach) level. includes excessive salivation, lacrimation, abdominal cramps, vomiting, urination, and loose stools. They occur within minutes to hours of consumption of the compound. The signs include

tachycardia or bradycardia, hypotension, miosis, frothing from the mouth, sweating, bronchospasm, and fasciculations. The initial management of acute OP poisoning includes cardio-respiratory stabilization and decontamination including removing clothes (a possible source of continued exposure), washing of skin and eyes, and consideration of gastric lavage and activated charcoal⁸. Atropine which is peripheral and central muscarinic receptor antagonist as well as pralidoxime chloride, which reactivates inhibited AChE are the mainstay of treatment⁹. Most deaths occur due to respiratory and cardiovascular failure, respiratory muscles paralysis and obstruction caused by bronchial secretions and OP induced bronchospasm¹⁰. It is important to know the clinical features and other factors that indicate the severity of poisoning and criteria to speculate the need for ventilator support which should be identified in the initial examination so that maximum patients should be benefitted from the available resources and there is limited literature available on clinical profile of OP poisoning cases, with this background present study was attempted to know the clinical presentation of OP poisoning cases admitted in tertiary care hospital.

METHODOLOGY:

A retrospective record based observational study was conducted at tertiary care hospital from 2019 to 2022. All patients admitted were included in study. Patients treated who were not admitted and Non- OP compound poison inhalation/exposure/ consumption were excluded. Total of 90 patients presented at emergency department, The data collected from medical record department. Information of age, sex, clinical features, investigation and outcome of the patients were recorded in pre-structured proforma. Data was collected and entered in excel sheet in computer. Data analysis was done by using descriptive and inferential statistical methods.

RESULTS:

A total of 90 patients presented in the emergency department and was admitted in ward of the institute during the study period of 2019-2022 with the clinical features of OP poisoning.

Mean age of the patient presenting in the emergency with clinical features of OP poisoning was 33.3 years (± 10.1) with range from 15 to 70 years. Majority, 55 patients were in the age group of 21-40 years, followed by 18 patients in 41-50 years age group, 9 patients were below 20 years of age and 5 are 50-60 years of age and 03 patients were above 60. (Table 1).

Males were 78 (80.0%) as compare to females 12 (13.3%).

Symptoms and Signs observed were Nausea and vomiting were most common symptom reported 72.2% of patients. Giddiness (53.3%), weakness (51.1%), loose motion (50.0%), irritation of eyes (44.4%). Most common clinical sign observed was of abnormal pupil in 25 (27.7%), fasciculations in 19 (21.1%), neck holding were present in 18.8% patients. 2 (2.2%) were conscious but disoriented. Remaining 88 (97.7%) patients were conscious and oriented at the time of admission. Co-morbidities were present in 4 (4.4%) patients. (Table 2)

65 patients had done blood urea and serum creatinine out of that 18 had raised blood urea level and 40 had raised serum creatinine level respectively. 60 patients had investigated for serum bilirubin out of that 38 had raised bilirubin.

The mean duration of ICU stay was <7 days in 40 (88.88%) out of 45 mild cases, 7 (23.33%) of 30 moderate cases, and 3 of 5 (60.00%) severe cases, whereas 5 (11.1%) of the 45 mild cases, 23 (76.66%) of the 30 cases, and 2 (40.0%) of the 05 severe cases required ICU stay of >7 days.

75 patients were discharged safely, 12 were DAMA (Discharge against Medical Advice) and 03 patients were died.

Discussion:

Self-poisoning with OP pesticides is a major public health problem across most rural Asia^{11,12}. Every year, of the estimated 500,000 deaths from self-harm in the region, about 60% are due to pesticide poisoning, and OPC accounts for two-thirds of these deaths¹³.

In present retrospective study, 55 (61%) of poisoning cases were in the age group 21-40 years, which was similar with studies conducted in Tamilnadu by Edwin et al, Dayanand et al^{14,15}. Male victims were commonly observed during study duration 78 (80.0%) than female females 12 (13.3%), which were similar with the findings of Patel et al, Gannur et al^{16,17}. Most of the males are professional insecticide sprayers, only few females are involved in this profession so The higher male: female ratio of 28.4:1. Nausea and vomiting was the most common symptom (72.2%) which coincide with study findings conducted by Patelet al, Banerjee et al^{16,18}. Abnormal pupil was the most common presenting sign (27.7%) which was similar with the other study Banerjee et al,. Out of 90 patients who were only 50 (55.55%) patients stayed less than 48-72 hours in hospital. The findings were similar with the studies in Goswamy et al¹⁹.

Conclusion

OP poisoning leads to life-threatening intoxication. Most cases are due to suicidal intent due to easy availability. Delay in hospital admission is associated with poor outcomes. As agricultural industries are growing, OP is widely used as insecticides. Nausea and vomiting was the most common symptom reported by the patients while abnormal pupil size was the most common sign observed at the emergency department. Maximum incidence of poisoning was seen in younger age group less than 30 years of age. Injections Atropine and PAM are very useful to treat in case of organophosphorus poisoning.

Table 1: Distribution of Cases according to Age

Patients Age (Years)	Numbers
15-20	9 (10.0%)
21-30	30 (33.33%)
31-40	25 (27.7%)
41-50	18 (20.0%)
51-60	5 (5.5%)
>60	3 (3.3%)
	90

Table 2: Distribution of patients according to presenting symptoms and Signs

Symptoms	Percentage
Nausea and vomiting	72.2%
Giddiness	53.3%
weakness	51.1%
loose motion	50.0%
irritation of eyes	44.1%
Signs	Percentage
abnormal pupil	27.7%
fasciculations	21.1%
neck holding	18.8%
Comorbidities	4.4%

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