(International Print/Online Journal)

SJIF IMPACT FACTOR: 5.565
PUBMED-National Library of Medicine ID-101739732

ISSN (Print): 2209-2870
ISSN (Online): 2209-2862

International Journal of Medical Science and Current Research (IJMSCR)
Available online at: www.ijmscr.com
Volume 4, Issue 5, Page No: 1201-1207
September-October 2021

IJMSCR

Clinical characteristics and outcome of patients of organophosphorus poisoning: a retrospective observational study at tertiary care hospital (skims soura), j & k india

[1]Sheenam Gazala, [2]Mohmad Saleem Chesti, [3]Syed Mushfiq,[4] Prof. Showkat Mufti
[2]Pediatrician, j & k Health Services, [3]Post Graduate Student, SKIMS Soura, Srinagar j & k
[4]Head of Department, Emergency Medicine SKIMS Soura j & k

***Corresponding Author:**
Sheenam Gazala

Type of Publication: Original Research Paper
Conflicts of Interest: Nil

Abstract

Objective: The study aims highlight clinical characteristics of patients of organo phosphorus poisoning and their outcomes at tertiary care hospital at SKIMS, Soura.

Material And Method: It was a retrospective observational study of 110 patients of organophosphate poisoning admitted in Emergency of Sheri Kashmir Institute of Medical Sciences (SKIMS) and Hospital Soura, Srinagar(j&k) catering all cases from rural and urban areas, from January July 2016 to july 2018 .Demographic variables, mode , route of transmission , time between exposure to presentation and clinical symptoms and management were considered and presented as frequencies and percentages ,while as mortality of organophosphorus patients was measured with Glasgow Coma Scale(GCS)

Results: In our study total number of 110 cases of organophosphate poisoning were reported in SKIMS Hospital between 1st july 2016 and 1st july 2018.In this study,65(59.1) were females and 45(40.9) were male patients .Accidental cases were 64(58.1) and intentional were 46 (41.8),while as 34(30.9) cases presented within 5 hours of OPP and 76(59.1) cases reported after 5 hours. Miosis was reported in 100% of cases followed by altered sensorium and tachypnea. Mechanical ventilation was done in 16(14.5) cases and mortality was seen in 5(4.6) patients in our study. GCS was used as tool to monitor levels of consciousness of OPP Patients and was found lower in non-surviving patients of OPP.

Conclusion: In this study we found that time from consumption of op substances to clinical presentation and then to hospital ,decreased GCS, mechanical ventilation were main predicting factors regarding outcome Organophosphorus poisoning cases were found more common among females, predominantly young population thereby drawing immediate attention to educate public through electronic(Television) and print media and by framing policies for general public.

Keywords: Clinical characteristics, organophosphate poisoning, Glassgow Coma Scale(GCS), Outcome.

INTRODUCTION

Organophosphorus poisonining is poisoning due to organophosphates(Ops)(1) and are used as insecticides, pesticide, herbicides, and chemical agents.Ops are widely used as agricultural insecticide; resulting in increased mortality and morbidity due to OP poisoning, particularly in under developed countries(2) .As per World Health Organization (WHO), the frequency of mortality due to OPCs poisoning has almost doubled in developing countries during past decade(2,3) Organophosphate poisoning (OPP) in most of cases are as a result suicidal intention or attempt and accidental (4,5). It is also reported that in low middle-income countries,overall mortality is 10-20% whileas it is 0.5-1% in high-income countries which is considerably higher, due to lack of emergency

medical services(6).In addition, majority of patients in acute Op poisoning are young with coincidental exposure being widespread in female housewives and children(7).Diagnosis of OPP is based on history of intake or exposure and clinical symptoms and sign along with laboratory parameters, while as in OPP, atropine and pralidoxime are main treatment modalities(8,9) along with intravenous fluids and oxygen therapy.

OPCs are taken via the oral, respiratory, or transdermal routes. OP compounds cross blood brain barrier as they are generally lipophilic, OPCs inhibit acetylcholine esterase (AChE) activity leading to accumulation of acetylcholine at nerve synapses and neuromuscular junction. overstimulation of acetylcholine receptors results in cholinergic synaptic transmission disruption in central nervous system, sympathetic nerve endings , somatic nerves and para sympathetic nerve endings in autonomic ganglia(10,11,12). OPP may result in muscarinic, nicotinic and CNS receptor overstimulation. Muscarinic overstimulation presents as hyperactivity of the parasympathetic system i.e miosis,bradycardia and bronchial glands hyper secretion in addition to muscle fasciculation, , cramping, weakness are nicotinic effects. While as central nervous system manifestations include seizures,respiratory depression and unconsciousness(13,14).

Above all, aggressive medical therapies, antidotes along with intensive management are the keys to prevention of morbidity and mortality associated with OPP (15)

Material And Method

The study was conducted in emergency department of medicine at sheri Kashmir institute of medical science and hospital,soura j&k from july 2016 to july 2018 .It was retrospective observational study and 110 cases of OPP were included in our study.

Inclusion criteria:

Patients of OPP in age group of 14 to 40 years.

Patients or their attendants willing to give consent and information.

Patients of OPP diagnosed on history, Presenting with substance, clinical and lab parameters.

Patients of OPP of either gender (males, females).

Exclusion Criteria:

Patients with Neurological Disorders.

Chronic diseases like Diabetes, Ischemic heart diseases, Hypertension.

Mixed poisoning.

Unwilling patients or attendants.

Patients with Psychological disorders.

Patients with electrolyte imbalances and on drugs like Tricyclic antidepressants, beta blockers.

Informed consent was taken from patients of OPP or their attendants, All patients of OPP aditted in emergency department were given Optimum treatment i.e. securing Airway, Breathing and Circulation, giving anticholinergic drugs like atropine 2 mg every 10 minutes till cholinergic symptoms get reversed and administering cholinesterase reactivator i.e pralidoxime 1 gram stat dose was given to patients with nicotinic receptor stimulation like progressive muscle weakness and muscle fasciculation's. Glasgow Coma Scale (GCS) recorded on initial presentation . Mortality was determined according to GCS < 12. Outcome was recorded using GCS score regarding mortality of patients of OPP during hospital stay. Patients of OPP were diagnosed based on history, clinic symptoms and signs along with laboratory parameters . Many times in our setting poisonous substances accompanies patients admitted in emergency which can also be helpful in diagnosis and predicting outcome of OPP patients. Data collected from patients or attendants was expressed in terms of frequency and us percentage using Microsoft excel and online calculators.

Results: Clinical Profile and Outcome of OPP Patients:

SECTION(a):

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Table 1: Age Distribution of OPP Patients.

Age in Years	Frequency(N)	Percentage (%)
14 to 21	35	31.8
22 to 30	53	48.1
31 to 40	22	20
Total	110	100

Table 2: Gender Distribution of OPP Patients.

Sex	Frequency(N)	Percentage (%)
Male	45	40.9
Female	65	59.1
Total	110	100

Table 3: Area of Living of OPP Patients.

Area of Living	Frequency (%)	Percentage (%)
Rural	72	65.4
Urban	38	34.5
Total	110	100

Table 4: Mode and Route of OPP Patients.

Mode of Poisoning	Frequency(N)	Percentage (%)
Accidental	64	58.1
Intentional	46	41.8
Total	110	100

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Route of Poisoning	Frequency(N)	Percentage(%)
Ingestion	67	60.9
Inhalatiomal	43	39.1
Total	110	100

Table 5: Time in (Hours) at presentation of OPP Patients

Time(hrs)	Frequency(N)	Percentage (%)	P-Value
<5	34	30.9	
5-10	36	32.7	0.770
>10	40	36.3	
Total	110	100	

Table 6: Type of Poison of OPP Patients.

Poison Type	Frequency(N)	Percentage (%)	P-Value
Off Label Products	31	28.1	
Rat killing products	28	25.4	
Anti lice Products	16	14.5	0.062
Agricultural Products	35	31.8	
Total	110	100	

Table 7: Outcome of OPP Patients:

Outcome of Patients	Frequency(N)	Percentage (%)	P-Value
Survived	105	95.4	
Death	5	4.6	<0.005

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Total	110	100

SECTION(b):

Table 1: Glasgow coma scale of OPP Patients at time of presentation

GCS	Frequency((N)	Percentage (%)	P-Value
Conscious	46	41.8	
Mild	20	18.1	<0.004(significant)
Moderate	26	23.6	
Severe	18	16.3	

Table 2: Clinical features of OPP Patients

Symptoms	Frequency(N)	Percentage (%)
Excessive salivation	27	24.5
Nausea/vomiting	61	55.4
Cough	45	40.9
Abdominal Cramps	51	46.3
Urinary Incontinence	33	30

Signs	Frequency(N)	Percentage (%)
Miosis	110	100
Altered Sensorium	60	54.5
Bradycardia	43	39.09
Tachypnea	62	56.3
Fasciculation's	15	13.6

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Table 3: Correlation of GCS Score with morbidity and mortality of OPP Patients

	GCS(<8),Frequency(n)&(%).total n=18	GCS(9-12) Frequency(N)&(%) total n=26	GCS(13-15) Frequency (N () %) Total n=20	P-Value
Aspiration pneumonia	1(5.5%)	2(7.6%)	Nil	
Respiratory failure	8(44.4%)	8(30.7%)	Nil	0.296 (NS)
Acute Renal Failure	2(11.1%)	1(3.8%)	Nil	
Sepsis	1(5.5%)	Nil	Nil	
Intubation	2(11.1%)	14(53.8%)	Nil	
Death	4(22.2%)	1(3.8%)	Nil	

Table 4: Association of GCS level with Time of Presentation in emergency of OPP Patients

Presentation Time(Hours)				
	GCS(<8)N=18	GCS(9-12)N=26	GCS(13-15)N=20	P-Value
<5hours	4(22.2%)	5 (19.2%)	5(25%)	0.513
5-10 hours	6(33.3%)	9(34.6%)	7(35%)	0.241
>10 hours	8(44.4%)	12(46.1%)	8(40%)	0.704

Discussion:

Organophosphorus poisoning (OPP) is increasing problem in developing countries including India, due to widespread application of organophosphorus compounds (Ops)easy in agriculture and pest control(16). However mortality in OP poisoning primarily depends on many factors like quantity of the ingested substance, time of presentation,GCS and treat modalities Acute and chronic poisoning occurs immediately or gradually over some time period(17) .These hazardous chemicals also play significant role in intentional and accidental poisoning(18) in some studies it has been reported that suicidal poisoning being common in low socio economic,illetrate and rural areas in India (19).Consistent with our study, as

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reported by El- Naggar et al. [22], concluded that early admission in hospital is associated with decreased mortality ,moreover in present study, 58.1% cases of OPP had altered sensorium; out of which 16.3 were with GCS ≤ 8 i.e. Deep coma.

Our study shows that OPP is more prevelant in females (59.1%) than males(40.9%) ,while as in our study most common clinical sign and symptom was miosis(100%) and vomiting(55.4%) respectively seen in OPP Patients, which is consistent with studies done in Chennai (ratio of 2:1) (20) and Turkey (ratio of 1.47:1) (21).In our study clinical sign miosis is seen in almost 100% of cases of OPP which is again consistent with Banday et al (22), miosis was most common sign seen in (100%) followed by respiratory symptoms, in addition Banerjee et al (23) also observed in miosis (91.94%) cases and most common clinical symptom was vomiting seen in (85.02%) cases.

However in organophosphorus poisoning, outcome with Glasgow coma scale or poison severity score, it was observed that GCS and IPCS PSS were equally effective in predicting outcome (24)

Moreover in our study low levels of GCS i.e. moderate and severe was associated with poor outcome which is in agreement with low GCS leading to development of respiratory failure and worse prognosis(25) ,also Sauter et al(26) study reported that greater than two thirds of patients with GCS ≤ 8 were not intubated without any severe complications.Morover, in case of OP poisoning proper and careful history , clinical profile, and garlic smell of pesticides should always be considered to make diagnosis at earliest (27)

Conclusions:

From our study we concluded that organophosphorus poisoning is more common in rural areas due to easy availability and also occupation wise and is more prevelant in young population particularly females. History. Clinical characteristics, low GCS,initial time of presentation and therapeutic modalities are main predictors determining outcome in organophosphorus poisoning.

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