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STUDY OF CLINICAL PROFILE OF ORGANOPHOSPHATE POISONING WITHSPECIAL REFERENCE TO ELECTROCARDIOGRAPHIC CHANGES AND ELECTROLYTE DERANGEMENTS

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ABSTRACT

Aim: To study clinical profile of organophosphate compound poisoning with special reference to electrocardiographic changes and electrolyte derangements.

Methodology: There are 200 cases of organophosphorus compound poisoning were admitted to Medicine wards in Government General Hospital, Kakinada during study period. But after applying inclusion and exclusion criteria, 100 cases were left out, which meets the criteria and have been selected for the present study.

Results: In this study, 100 cases of poisoning by an organophosphorus compound were clinically examined, and the following observations were made. The age group between 21 and 30 is the most vulnerable (44%). The ratio of men to women is 4.5:1. The oral route of intake was used with all patients. The type of the compound that is an organophosphate was identified (64%) and unidentified (36%). The most prevalent organophosphate compound among the identified group was Monocrotophos (36%) and it was followed by Dimethoate (Roger) (19%), Diazinon (6%), Melathion (2%), and Parathion (1%). The majority of the patients (55%) were admitted to the hospital within 2-4 hours of ingesting an organophosphorus compound. The majority (54%) of patients spent 6–10 days in the hospital overall. Present symptoms include blurred vision (46%), sweating (44%), salivation (42%), vomiting (48%), and lacrimation (38%). Tachypnoea (96%), altered consciousness (78%), constricted pupils (52%), and fasciculation (41%), which are common symptoms. Of the 100 patients in this study, 20 patients passed away. Only 9 patients with normal ECGs and 11 (55%) with a prolonged QTc interval were among the deceased patients. ECG changes have a poor prognosis and are closely correlated with an increase in complication incidence. Organophosphorus compounds have variable cardiovascular effects that frequently shift over the course of poisoning. Continuous cardiac monitor- ing is required because of ECG changes like QTc prolongation, which can be danger- ous.

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Conclusion: The current study found that serum electrolyte (Na, K+, Ca++) derangements were statistically insignificant and were not useful in determining the prognosis of organo-phosphorus compound poisoning.

Keywords: Organo phosphorus compounds, Serum electrolytes, ECG, QTc interval.

INTRODUCTION

Organophosphorus compound poisoning is a worldwide issue and a common medical emergency with a high fatality risk, if not recognized and treated promptly. Since the advent of insecticides for agricultural and residential insecticide risks, physicians have grown interested in the toxicological aspects of organophos- phorus compounds. In addition to unintentional exposure using these compounds as agricultural pesticides, these chemicals are commonly employed for suicidal and homicidal intents due to their low cost and accessible availability.

The most prevalent medico toxic emergency in India is organophos- phorus compound (OPC) poisoning. Schrader invented organophosphorus com- pounds soon before and during WWII. They were originally utilized as an agricultur- al pesticide and then as possible chemical warfare weapons.

Organophosphorus (OP) chemicals are employed as insecticides, herbicides, and nerve gas as chemical warfare weapons. Pesticides are a class of chemicals mostly employed in agriculture and against the carriers of illnesses like malaria and filariasis. There are several definitions of a pesticide, but the Food and Agriculture Organization of the United Nations (FAO) defines one as any compound or combination of substances designed for preventing, eliminating, or controlling any pest, including vectors of human or animal illness, undesired species of plants or animals, or anything else interfering with the production, processing, storage, or marketing of food, agricultural commodities, wood, and wood products. The term covers compounds applied to crops either before or after harvest to prevent the product from deteriorating during storage and transport[4]. It also includes substances intended for use as a plant growth regulator, defoliant, desiccant, fruit-thinning agent, or agent for preventing the premature fall of fruit.
According to the WHO, more than 220,000 people worldwide die each year because of 3 million pesticide poisonings. Alarming mortality and toxicity rates are reported in developing nations like India and Sri Lanka.

The way that organophosphates work is by permanently blocking the cholin- esterase enzyme. This causes synapses and myoneural junctions to accumulate acetylcholine, which then stimulates the cholinergic system excessively. Organo- phosphorus chemicals have also been documented to have direct cardiotoxic ef- fects. Cardiac manifestations often accompany poisoning with these compounds which include hypotension, hypertension, sinus bradycardia, sinus tachycardia, noncardi- ogenic pulmonary edema and cardiac arrest. ECG changes reported in previous studies include QTc interval prolongation, ST-T changes, along with various forms of arrhythmias, which may be serious and fatal. These complications are potentially preventable if they are recognized early and treated adequately.

AIMS AND OBJECTIVES

AIM:

Study of clinical profile of organophosphate compound poisoning with spe- cial reference to electrocardiographic changes and electrolyte derangements.

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OBJECTIVES:

1. To study the clinical profile of organophosphate compound poisoning
2. To evaluate the prognostic significance of electrocardiographic chang- es and electrolyte derangements in organophosphate compound poisoning.

MATERIALS AND METHODS

Study design: Cross sectional Analytical study
Setting: Government General Hospital, Kakinada
Sample size determination: 100
Sample size:
100 patients selected randomly who were admitted to medicine ward with the History of organophosphorus compound poisoning to Government General Hospital, Kakinada between July 2021 to June 2022.

Inclusion Criteria:
All adult patients of either sex who had consumed or been exposed to organophosphorus substances in the past, who were admitted to a hospital <12 hours after ingestion and who had not received outside treatment.

Exclusion Criteria:

1. All patients with poisoning due to compounds other than organo- phosphoruscompound well excluded.
2. Patient with prior history consumption of organophosphorus com- pound were excluded
3. Patient who received partial treatment outside and referred later to our hospital wereexcluded.
4. Patient who are known case of cardiac disease were excluded.
5. Patient with doubtful diagnosis

Procedure:
Data was collected by taking detailed history from the patients and / or relatives and were subjected to a thorough clinical examination with ref- erence to signs of organophosphate poisoning and investigations. Diagnosis was made on following criteria.

1. History
2. Physical examination
3. Investigation which includes estimation of pseudocholinesterase level in blood, standard 12 lead ECG , serum electrolytes (Na^+, K^+, Ca^{2+}) and other routine investigation.

Blood sample was drawn from all those patients who were suspect- ed to have organophosphorus compound poisoning before giving any treatment.

Investigations
Standard 12 lead ECG Prior to the delivery of atropine therapy; an ECG was taken at admission. Repeat ECGs were taken while in the hospi- tal, if needed, and while the patient was being discharged. ECG recordings were taken as soon as patients arrived in medical emergency departments and were recruited for investigation prior to the administration of atropine. The ECG study covered rhythm, rate, QRS axis, ST-T changes, con- duction anomalies, and assessment of PR and QT intervals. The manual dis- tance from the beginning of Q wave to its conclusion is known as the QT inter- val. The T wave was considered to

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have ended when it returned to the T-P baseline. All leads' QT intervals were monitored, and the QTc was calculatedusing the longest QT interval.

The corrected QT (QTc) calculated according to the formula of Bazzet.

$$QTc = \frac{QT}{\sqrt{RR}}$$

The maximum QTc interval length is around 0.46 seconds (460ms). In this study, a QTc interval longer than 0.46 sec is considered to be protracted.
Before beginning any treatment, serum electrolytes (K+, Na+, and Ca+2) were measured in all patients. These measurements were repeated as needed and at the time of discharge.
Age, sex, employment, manner of exposure, kind of insecticide, time be- tween exposure and hospitalization, patient prior medical history, family medical history, and personal medical history were among the information gathered from the patient's attendants. The length of the hospital stay and the treatment plan were recorded.

Every patient received decontamination care, including gastric lavage. Atropine 2-4 mg bolus intravenously, repeated initially every 5–15 minutes until atro- pinization Every 15 to 30 minutes or as needed, atropinization was maintained for 24-48 hours with sporadic dosages, and subsequently decreased over several days depending on the patients' responses. All patients received 1-2g I.V. every 12 hours for 72 hours, depending on the patient's state, after receiving a 2g i.v. bolus of pralidoxime chloride over 10 to 15 minutes right after admission.
During the patient's hospital stay, the airway was evaluated to determine whether endotracheal intubation was necessary. A patient who was having breathing problems was intubated and for the patient who lived, psychiatric counseling was provided in addition to mechanical ventilator assistance.

Values for the chance of occurrence were expressed using statistical analy- sis. When a statistical test of association of characteristics was conducted, the 2 Yates' correction (2yc) and the standard error of difference between two propor- tions (SE p-p) were applied, and conclusions were reached.

RESULTS

There are 200 cases of organophosphorus compound poisoning were admit- ted to Medicine wards in Government General Hospital, Kakinada during study pe- riod. But after applying inclusion and exclusion criteria, 100 cases were left out, which meets the criteria and have been selected for the present study.

RESULTS

Table -1: Age and sex distribution

Age group (Years)	Male	Female	Total	Percentage
<20	8	14	22	22
21-30	36	8	44	44
31-40	13	2	15	15
41-50	9	2	11	11

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>51	6	2	8	8
Total	**72**	**28**	**100**	**100**

Age group ranges from 15-66 years, incidence is maximum in 3rd decade i.e. between 21-30 years (44%). In the present study, youngest patient is 15 years old andoldest patient is 66 years old. Mean age 30.9 Yrs + SD 12.11 Yrs.

Table -2: Male and Female ratio according to age group

Age in years	Ratio
<20	2: 3.5
21-30	4.5: 1
31-40	6.5: 1
41-50	4.5: 1
>51	1.5: 1

Out of 100 patients of organophosphorus compound poisoning, 72% were male and 28% were female. Male to female ratio in present study is 4.5: 1.75.

Table no 3.Type of Poison Consumed

Type of compound	Number of cases	Percentage	Death	Mortality rate
Monocrotophos	36	36	10	27.8%
Dimethoate (Roger)	19	19	3	15.8%
Diazinon	6	6	1	16.6%
Melathion	2	2	0	0
Parathion	1	1	0	0
Unidentified	36	36	6	16.7%

Out of 100 patients, nature of compound was identified in 64%patient and unidentified in 36% patient. This is because, most of the people being an illiterate, do not know the exact type and nature of the compound.

In them, patient had characteristic sign and symptoms of organophosphate com- pound poisoning, or the patient gave history that he had taken insecticide. Mortality was more among monocrotophos group (27.8%) followed by Diazinon (16.6%), Di- methoate (Roger) (15.8%) and then unidentified group (16.7%).

Table no 4.Duration from exposure to hospitalization

Time in hours	Number of cases	Mortality	Mortality rate
< 2 hours	34	4	11.8%
2-4 hours	55	9	16.3%
>4 hours	11	7	63.6%

Majority of patients were hospitalized within 2-4 hours of exposure. Mortality rate (11.8%) was least among the patients who presented earliest as compared to thosewho presented later.

Table no 5.Total stay in hospital

Number of days	Number of cases	Percentage
0-5	25	25%
6-10	54	54%

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11-15	19	19%
>15	2	2%
Total	**100**	**100**

Majority of patients (61%) were hospitalized for 6-10 days.

Table no 6.Presenting symptoms

Symptoms	Number of cases	Percentage
Vomiting	48	48%
Sweating	44	44%
Salivation	42	42%
Blurring of vision	46	46%
Lacrimation	38	38%
Breathlessness	43	43%
Urinary incontinence	21	21%
Convulsions	17	17%
Fecal incontinence	18	18%
Total	**100**	**100**

Commonest symptom was vomiting (48%) followed by Blurring of vision (46%), Breathlessness (43%), Salivation (44%), sweating (44%), and lacrimation (38%).

Table no 7.Clinical signs

Sign	Number of cases	Percentage
Smell of poison	98	98%
Tachypnoea	96	96%
Altered consciousness	78	78%
Miosis	52	52%
Fasciculation	41	41%
Tachycardia	26	26%
Bradycardia	23	23%

Commonest sign was Smell of poison (98%) followed by Tachypnoea (96%), Altered consciousness (78%), Miosis (52%), Fasciculation (41%), Tachycardia (26%) and Bradycardia (23%).

Table no 8.ECG changes observed

ECG	Number ofpatients	Percentage
Rate		
Normal	51	51
Sinus tachycardia	26	26
Sinus bradycardia	23	23
Rhythm		
Sinus rhythm	98	98
Arrhythmia	2	2
Conduction defect		
Prolonged PR interval	3	3
ST segment and T wave changes		
ST elevation	0	0
ST depression	8	8

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T wave inversion	6	6
T wave flattening	2	2
QTc interval prolongation	20	20

Electrocardiographic manifestation

Note that the table refers only to ECG manifestation recorded before admin- istration of atropine treatment. Sinus tachycardia was most common ECG abnor- mality (26%) QTc prolongation was seen in 20% patient's sinus bradycardia was seen in 23% patient.

Table no 9.Comparing severity and mortality among normal QTc and QTc prolongedpatients

	Prolonged QTc	Normal QTc	P value
Number of patients	20	80	
Complications*	17	33	X2=12.25,P<0.001
Complication (%)	85%	41.25%	
Severe poisoning	8	35	X2=0.09, P >0.05
Severe poisoning (%)	40%	43.75%	
Death	11	9	X2=22.27, P<0.001
Mortality (%)	55%	11.25%	

At least one complication during stays in hospital.

Among QTc prolonged patients 8 (40%) had severe poisoning and 11 pa- tients (55%) expired. Among normal QTc patient 35(43.75%) had severe poisoning and only 9 (11.25%) expired. This difference in mortality is statistically highly significantX^2= 22.27, P <0.001).

Table no 10.Complications comparison

Complication	Number of patients	Percentage
Pulmonary edema	33	33%
Respiratory failure	27	27%
Aspiration pneumonia	18	18%
Intermediate syndrome	10	10%

The patient who developed respiratory failure was managed with ventilator support 13 patients recovered and 14 patients expired. In QTc prolonged group 17 (85%) patients developed at least 1complication and 33 (41.25%) patients in normal QTc group also developed complication. This differ-ence was statistically highly significant.^{2}=12.25, P<0.001).

Association between severity of poisoning and QTc interval prolongation isnot significant in our study ^{2}=0.09, P>0.05).

In all patients with QTc prolongation who survived the QTc interval and all other ECG changes reverted to normal before discharge.

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Six of the QTc prolonged patient developed ventricular tachycardia of Tor- sades de pointes type.

Conduction defect was observed in 3 patients, and it was PR prolonga- tion.100% patients were in sinus rhythm. ST depression was noted in 8% patients. T wave inversion noted in 6% patient.

In patients who survived, there ECG changes reverted back to normal by the time patient recovered. Sinus Tachycardia was more common (26%) than sinus Bradycardia (23%).

Other cardiac manifestation observed in this study was hypertension which was observed in 15% patient.

Table no 11.Comparison of serum calcium in patients

Patients	Serum calcium normal	Serum calcium decreased
Survived without com- plications n = 45	42	3
Survived with compli- cations n = 35	27	8
Expired cases n = 20	16	0

X^2= 0.246, P > 0.05, not significant. None of the patients were having increased levels calcium. Hypocalcemia is found in only 11 patients. As number is small, this is statistically insignificant in present study (X^2=0.246, P > 0.05, not significant) Figure 15: Comparison of serum calcium in patients.

Table no 12.Comparison of serum potassium in patients

Patients	Serum potassium normal	Serum potassium decreased
Survived without com- plications n = 45	39	6
Survived with compli- cations n = 35	28	7
Expired cases n = 20	19	1

None of the patients were having increased levels serum potassium.Hypoka- lemia is found in only 14 patients. As number is small, this is statistically insignifi- cant in present study (X^2=0.62, P > 0.05, not significant).

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Table 13.Comparison of serum sodium in patients

Patients	Serum sodium normal	Serum sodium de-creased
Survived without complica-tions n = 45	37	8
Survived with complications n = 35	34	1
Expired cases n = 20	19	1

None of the patients were having increased levels serum sodium. Hypo- natremia is found in only 10 patients. As number is small, this is statistically insignif- icant in present study (X^2=2.14, P > 0.05, not significant).

Table 14.Comparison of Mild, Severe and Life threatening groups of poison-ing

	Mild	Severe	Life threatening
Number of patients	38 (38%)	43 (43%)	19 (19%)
Prolonged QTc	0	8 (18.6%)	12 (63.15%)
Complications	13 (34.2%)	21 (48.8%)	16 (84.2%)
Death	0	1	19

In this study, the grading of severity was assessed by using the criteria of Bardin et al. Out of 100 patient 38% patient have mild and 43% patient had severe poisoning and 19% patient belongs to life threatening group. QTc prolongation was seen in 12 patients (63.15%) with life threatening group, 8(18.6%) of severe group and no patient in mild poisoning had QTc prolongation. This difference was statisti- cally significant.Complications observed in mild cases were 13 (34.2%). 21 (48.8%) patients of severe group had at least one complication. 16 (84.2%) patients of life- threatening group had at least 1 complication. All deaths occurred in life threaten- ing group. 3 patients of life-threatening group expired without complications and without prolonged QTc interval.

Mortality rate

In this study, out of 100 patients, 20 patients (20%) died. Of these expired Pa- tients, 9 patients had normal ECG, 11 (55%) had a prolonged QTc interval.

Table no 15.Relation between number of cases in each sub-group with mortality andrespiratory paralysis

Grade	Total cases	Respiratoryparal-ysis	Mortality
Very mild (>50%)	30	3	2 (6.6%)
Mild (41-50%)	10	1	1 (10%)
Moderate (10-40%)	41	6	1 (14.6%)
Severe (<10%)	19	17	16(84.2%)

Pseudocholinesterase level-normal level 2189-9180 IU/L. According to Mosses classification the severity of poisoning can be of four grades depending on cholines- terase level.

As compared to moderate and severe grade a statistically highly significance in the morality is

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seen in severe grade, it means severe depression of serum cholinesterase level have high mortality. Most of the cases were in the moderate group. Respiratory paralysis was higher in moderate and severe group. Morality was higher in severe group. Out of 19 patientswith severe degree of poisoning, 17 developed respiratory paral- ysis. In one case even though the level of Pseudocholinesterase was low, that patientsdid not develop respiratory paralysis.

DISCUSSION

Organophosphorus compounds are a significant group of the many substances used in suicide attempts in India. India and other developing nations are unusual in this re- gard.
In developed nations, sedatives, antidepressants, and other related drugs ac- count for 80% of suicide poisonings. According to hospital statistics, organophospho- rus poisoning accounted for more than 60% of all cases of suicidal behavior. It is one of the most prevalent medico toxic emergencies in India.

Organophosphorus compounds are causing alarming mortality and morbidity. The complications of organophosphorus compounds are potentially fatal and can be preventable if they are recognized early and treated adequately.

In the current study clinical profile of organophosphorus compounds poisoning and prognostic significance of electrocardiographic changes and electrolyte derange- ments were studied and compared with previous other studies.

In this study, the age group of 21 to 30 years old had the highest incidence of organo- phosphorus poisoning (44%), which was comparable to studies conducted by Mathur A ET al[1] and P Karki et al[2].

In this study, males (72%) had a higher incidence of OP poisoning. The ratio of men to women was 4.5:1.75. Similar reports by A Goel et al.[3] are available (2.5:1). Male patients make up the majority of the population, which also suggests that OP compounds are more accessible to male patients and that they seek medical attention more fre- quently because they are the breadwinners for their families and are subjected to more stress in society.

Participants in the study were equally split between Kakinada's rural and urban areas, at 50% each. This is a result of these compounds' convenient accessibility in both areas. In contrast, the majority of patients in the study by Wagner G.S.[4] were patients who resided in urban areas.

Socio economic status:

The majority of the study participants were low socioeconomic class manual labourers and members of the agricultural industry. Studies by A Goel et al.[3] found similar results.

Mode of exposure:

Suicidal behaviour was the mode of exposure in all of the patients in the current study. Results from A Goel et al [3] from Pondichery (96%) and P Karki et al [2] (89%) were comparable.

In 64% of the cases, the insecticides used were identified, while in 36% of the cases, they were not. In the identified group of patients, monocrotophos was the most preva- lent agent (36%), followed by dimethoate (Roger) in 219%, diazinon (6%), parathion (1%), and melathion (2%).

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A Goel et al.[3] conducted earlier studies that identified Mono- crotophos as the typical agent. This might be caused by the lack of locally accessible chemicals for agricultural use in this region.

Duration between exposure and hospitalization:

In this study, we found that compared to patients who were hospitalised within 2 hours of exposure, who had a mortality of 34%, both severity and mortality were significantly higher in patients who were admitted more than 2 hours after exposure.

Karnik et al.[51] found no correlation between the delay in starting a particular treatment and survival, but the majority of other studies, including this one, show a significant link between the delay in hospitalisation and higher mortality.

Clinical manifestations:

Vomiting was the most frequent symptom in the current study, occurring in 48% of cases, followed by sweating (44%), and salivation (42%).

In this study, 98% of the patients had the distinctive odour of an organophosphorus compound. Other prevalent clinical symptoms included disturbed consciousness (78%), tachypnea (96%), miosis (52%), and fasciculations (41%). Comparable studies include those by A Goel et al[3] and Mathur A et. Al[2].

Electrocardiographic manifestations:

49 patients (49%) had electrocardiographic (ECG) manifestations. In 80% of the patients, Kiss and Fazekas et al.[7] and Saadeh AM et al.[9] reported similar findings.

The most frequent ECG abnormality observed in 26% of our patients was sinus tachy- cardia. As the most frequent ECG change in acute organophosphorus poisoning,

Accordingly, this study links QTc lengthening to a higher risk of complications and a higher mortality rate. A prolonged QTc interval indicates a poor prognosis. Saadeh AM et al.[9] found comparable correlations between QTc interval prolongationand severity and mortality.

The abnormalities in serum electrolytes have no relation to this QTc interval phenomenon. Most of the patients of Kiss and Fazekas et al[7] had normal serum electrolytes. Serum electrolytes (sodium, calci- um, and potassium) in our 28 patients with QTc interval prolongation were found to be normal.

ST-T changes:

In this study, other ECG manifestations included ST-T changes in 18% of pa- tients, sinus tachycardia in 29%, and sinus bradycardia in 21% of patients. Numerous researchers noted that acute OP poisoning sometimes resulted in non-specific ST-T changes. Along with hypoxemia, other potential mechanisms include excessive parasympathetic activity and coronary spasm.

In the current study, ST depression was seen in 10 (10%) patients with ST-T changes, T wave inversion in 6 (6%) patients, and T wave flattening in 6 (6%). The ST segment of no patient was elevated. These outcomes were comparable to P Karki et al. [2]'s and Sadeeh A. M. et al. [9]'s studies.

Although recent studies have shown tachycardia to be more frequent in acute OP poisoning, the classic teaching has emphasised the importance of sinus bradycardia for diagnosis. This is

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likely due to preganglionic nicotinic receptor stimulation followed by the release of adrenaline and noradrenaline from the adrenal gland, which leads to a predominance of adrenergic effect on the heart. Tachycardia may be a result of respitory failure (mechanical and pulmonary edoema) in the presence of hypoxia. [4-7]

In our study, sinus tachycardia was more common than sinus bradycardia, which was present in 29% of patients. These findings concurred with those of SaadehA. M. et al.[9], who noted sinus tachycardia in 35% and sinus bradycardia in 28% of pa- tients,

Conduction disturbances:
In the current study, 3% of patients had conduction abnormalities that manifest- ed as an extension of the PR interval. Saadeh A M et al[9] and A Mathur et al[1] both reported similar results.

QTc interval prolongation was seen in 4.76% of patients in the mild group while it was seen in 87.5% of patients in the life-threatening group. According to statistics, this was very significant (2=16.72, P 0.001).
In contrast to the group of patients with mild manifestations, who had a complication rate of 0% in our study, 87.5% of patients with life-threatening manifestations experienced at least one complication during their hospital stay. In the group with mild manifestations, no deaths were noted.

The majority of patients with an abnormal ECG had QTc interval prolongation, Complication rates were found to be significantly higher in patients with prolonged QTc intervals than in those with normal QTc intervals (2=21.18, P0.001). In our study, there was no significant correlation between the degree of poisoning and the lengthened QTc interval (2=0.02, P0.001). Our study's complications are comparable to those in studies by A Goel et al.[3] and A M Saadeh et al.[9].

Of the 24 patients (24%) who experienced respiratory failure, 10 experienced it within the first 24 hours. Two patients had an intermediate syndrome that caused respiratory failure to develop slowly. With respiratory failure, 12 patients passed away.

The current study's mortality rate is 16%. Each patient who passed away had some sort of life-threatening condition. All but two patients had ECG symptoms. The most frequent ECG abnormality connected to mortality was QTc interval prolongation. The reported literature indicates that the mortality rate varies between 4% and 85%.

LIMITATIOS OF THE STUDY:
This study is based on a single centre and hospital based; hence the results obtained may not reveal the true burden of the disease in the community taken as a whole.

STRENGTHS OF STUDY:
This study is dealing with one of the most common poisonings in general population. There are many Indian and international studies similar to this study but limited studies were there in Andhra Pradesh.

In this study there were 100 patients and most of the patients belong to Kakinada and surrounding areas of east Godavari district generating insights into the burden of the organophosphorus compound poisoning problem in this locality.

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This study is about correlation between the various electrocardiographic changes in patients who consumed organophosphorus compound poisoning which arelethal and preventable.

CONCLUSION

The current study found that serum electrolyte (Na, K+, Ca++) derangements were statistically insignificant and were not useful in determining the prognosis of organo-phosphorus compound poisoning. Estimation of electrocardiographic changes will be useful parameter in assessing prognosis of organophosphorus compound poisoning patients. Serum electrolytes are not helpful in assessing prognosis in organophosphorus com- pounds poisoning patients. Estimating electrocardiographic changes will be a helpful parameter in determining a patient's prognosis after ingesting an organophosphorus compound.

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Conflict of Interest

None

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REFERENCES

1. Mathur A., Swaroop A., Agarwal A. ECG changes in acute organophosphorus com-pound and almunium phosphide poisoning. The Indian Practitioner 1999; 52; 248-252.
2. Karki P, Ansari J A, Bhandary S, Koirala S. Cardiac and Singapore Med J Electrocar- diographical manifestations of acute organophosphate poisoning. Singapore Med J 2004; 45:385-89.
3. Goel A., Joseph S. Dutta T.K Organophosphate poisoning: predicting the need for ventilator support. JAPI 1998; 46:786-790.
4. Wagner G.S. Interpretation of the normal Electrocardiogram, In: Marriot's Practical Electrocardiography. 10th edition, Lippincott Williams and Wilkins 2001; 62-63.
5. 5.Bazette H.C. An analysis of the time relationship of electrocardiogram. Heart 1920; 7:353-370.
6. Brown S.K., Ames R.G., Mengle D.C. Occupational illness from Cholinestrase inhibit- ing pesticides among agricultural applicators in California1982-1985. Archives of Envi- ronmental Health 1989; 44:35-39.
7. Chuang F.R., Jang S.N. et al. QT prolongation indicates poor prognosis in patients with organophosphate poisoning. American Journal of Emergency Medicine 1996; 14: 451-453.
8. Kiss J, Fazekas T. Arrhythmia in Organophosphate poisoning. Acta cardiol 1979; 34: 323-330.
9. Saadeh A M, Farsakh N A, Al-Ali M K. Cardiac manifestations of acute Carbamate andorgnophosphate poisoning. Heart 1997; 77: 461-4.